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THE FAMINE INQUIRY COMMISSION

FINAL REPORT

1945

MADRAS

PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS
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THE FAMINE INQUIRY COMMISSION

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INTRODUCTION

This is the second report of the Famine Inquiry Commission appointed under Ordinance No. XXVIII of 1944. We shall begin by repeating our terms of reference.

To investigate and report to the Central Government upon the causes of the food shortage and subsequent epidemics in India, and in particular in Bengal, in the year 1943, and to make recommendations as to the prevention of their recurrence, with special reference to—

(*a*) the possibility of improving the diet of the people and the quality and yield of food crops, and

(*b*) the possibility of improving the system of administration in respect of the supply and distribution of food, the provision of emergent medical relief and the emergent arrangements for the control of epidemics in famine conditions in those areas and in those aspects in which the present system may be found to have been unsatisfactory.

Our first report, entitled "Report on Bengal" was published in May 1945. This was concerned mainly with the history and causes of the great famine of 1943, but we dealt also with problems of food supply and distribution in Bengal in the immediate future, and with medical relief and the control of epidemics in famine. In analysing the causes of the famine we had to give considerable attention to the all-India food situation and food policy during the critical war years, and in the chapter on food administration in Bengal in the immediate future we referred freely to administrative methods followed in other provinces, but Bengal itself was throughout the main theme of the report.

2. In the present report, which is divided into four parts, we have attempted to cover the remaining items in our terms of reference. Part I is in general concerned with the emergency food situation in India as a whole and the steps which have been taken to relieve it. As a starting point, the position in 1943—the year of the famine—is described in detail. Next, we consider the results of the Grow More Food campaign which was initiated in 1942. Other chapters in Part I deal with food administration in India during the war, statistics of acreage and yield of crops, the need for imports, and food administration in India during the immediate post-war period. This part of our report relates, in fact, to what may be described as short-term food policy and the immediate practical measures which should be taken to avoid any repetition in the near future of the grave situation from which India is now emerging.

The remaining three parts, which form the bulk of our report, are concerned with the tremendous item "(*a*) the possibility of improving the diet of the people and the quality and yield of food

crops," which, as is at once apparent, is for practical purposes co-extensive with the whole future development of the country. In approaching these far-reaching questions we first attempt (Part II) to define the problem in chapters on "Population" and "Nutrition" showing in the latter that the present diet of the bulk of the population is deficient in quality and often in quantity, that the supply of protective foods is grossly inadequate, and that the economic condition of the masses is such that they could not afford to purchase a good diet even if sufficient supplies of protective foods were available. The last chapter in Part II deals with food policy in its long-term aspects and may be regarded as the key chapter in our report. In it we define in broad outline suitable objectives of food policy and the measures necessary to attain them. Most of the measures are discussed and elaborated in greater detail in later chapters of the report.

Part III entitled "The Improvement of Food Production and Nutrition" is in general concerned with the possibilities of developing agricultural production by the application of scientific knowledge and technical resources. We discuss under various heads —irrigation, manure, improved varieties, pests and diseases, agricultural implements and mechanization—methods by which agricultural production in general can be increased. A separate chapter is devoted to the problems of animal husbandry including milk production. The need for improving the health of the cultivator is emphasized, with particular reference to the prevention of malaria, which is also of importance in connection with land reclamation. The important questions of agricultural research and the organization of agricultural departments are discussed. We consider separately at some length the production of various supplementary and protective foods, including milk, fish, vegetables, fruits, tubers and other high-yielding crops. The last chapter of Part III deals with specific measures for improving nutrition, apart from the general approach to this objective by increasing food supplies and raising purchasing power.

Finally, we attempt to deal, in Part IV, with the thorny problem of the reorganization of agriculture, to the end that the cultivator, the producer of food, may be in a position to make use of improved agricultural methods and increase his outturn. The questions discussed are the subdivision and fragmentation of holdings, the occupancy-right-holder and the non-occupancy tenant, the permanent settlement, agricultural prices, rural credit and employment, multi-purpose co-operation, organization of large landholders, and rural administration and co-ordination.

A summary of our conclusions and recommendations forms an annexure to the Report.

3. In our first report, dealing with the famine in Bengal, we remarked that our responsibilities differed from those of earlier Famine Commissions in India in that we had to report, not on

famine due to the obvious cause of drought, but on a calamity resulting from a complicated series of events for which both natural causes and human error were responsible. We had, in fact, a more difficult task to perform than that undertaken by our predecessors. As regards our second report, we venture to make the same claim. In 1902, when the last Indian Famine Commission reported the field to be covered in considering the prevention and relief of famine and the development of food production was a limited one, and the Commission, it may be said, had that field to itself, or almost to itself. To-day things are different. A great deal of knowledge has accumulated, and many of the subjects with which we are concerned are normally dealt with by specialists who have devoted a lifetime to their study. Further, numerous reports on reconstruction and development, which overlap to some extent with our report, have been prepared, or are under preparation, by committees of the Central and Provincial Governments, non-official bodies and individual experts. The position is such that many of the questions to which we have devoted a single chapter in our report would in themselves almost provide scope for the enquiries of a commission. In the circumstances we may perhaps be excused for any technical errors which may occur in sections of the report, and for our inability to deal adequately with so wide a range of subject-matter.

It is fully apparent that progress in the spheres of community life with which we are most directly concerned—nutrition and agriculture—and progress in many other spheres are interdependent. There are, however, various important questions relevant to the main theme of our report which have either not been discussed at all, or referred to very briefly. Thus, the illiteracy of the masses is a serious obstacle to all forms of progress, including those with which we are most directly concerned, and the need for the vigorous development of education in all its aspects is obvious. We have not, however, dealt with this question, which has been fully considered in the " Report of the Central Advisory Board of Education " (1943), in any detail. We have made little reference to agricultural marketing and rural transport, both of which were dealt with at length by the Royal Commission on Agriculture. As regards some of the subjects discussed in our report—the improvement of agricultural economy, for example—we have in general attempted to state the problem rather than to solve it, suggesting general lines of approach and investigation rather than clear-cut schemes for immediate action.

4. Our main responsibility, as we have conceived it, has been to survey the problem as a whole and to define the broad lines of a food policy designed to prevent any future threat of famine and to improve the diet of the people. In attempting to do this, and to view in true perspective the far-reaching measures necessary for the attainment of the objective, we have left many gaps to be filled in by others. Much hard work and hard thinking will be needed to further the reconstruction and development of the country along sound lines. The Commission of which we are members is

the latest of four Indian Famine Commissions. We hope that it will be the last Famine Commission and at the same time the first of a series of Food Commissions concerned not with the prevention of famine, but with the replacement of hunger and malnutrition by plenty.

ACKNOWLEDGMENTS

We are particularly grateful to the Provincial Governments for the information they supplied to us in reply to our questionnaire. We fully recognize that the collection of this information and the preparation of the replies must have thrown a heavy additional burden on their officers. We are also grateful to the witnesses, official and non-official, who assisted us in our efforts to deal with the wide range of subjects covered by our terms of reference.

The preparation and arrangement of the large amount of material collected during our inquiry have placed a heavy strain upon our office, and we desire to place on record our appreciation of the manner in which the staff of the Commission has discharged its duties.

In particular grateful acknowledgments are due to Mr. R. A. Gopalaswami, O.B.E., I.C.S., our Secretary, Khan Bahadur Shaik Khurshid Mohammed who acted as Joint Secretary up to the end of December 1944, Dr. M. M. Junaid, M.A., PH.D., who succeeded him as Joint Secretary, and Rai D. N. Maitra Bahadur, Deputy Secretary, for the zealous and efficient manner in which they have discharged their responsibilities.

We also wish to express our gratitude to Mr. T. R. Rajagopalan, Superintendent, and to all the members of the staff for ungrudging and efficient service throughout the inquiry.

Finally, we are grateful to Lieut.-Col. K. R. K. Iyengar, C.I.E., O.B.E., I.M.S. (Retd.), Director of the Pasteur Institute, Coonoor, and officiating Director, Nutrition Research Laboratories, Coonoor, for the hospitality of the Institute and the Laboratories during the months April–July, 1945.

PART I

SHORT-TERM ASPECTS OF THE FOOD PROBLEM

PART I

Short-term aspects of the food problem

CHAPTER I.—FOOD SHORTAGES IN INDIA IN 1943

We have dealt with the food shortage in Bengal in 1943 in our report on that province. Our terms of reference include the study of the food situation in the same year in other parts of India. A review of that situation will make a suitable starting point for the present report. While in certain respects 1943 was an exceptional year, the supply situation in general during the next few years is not likely to be very materially different. Hence an account of the position in 1943 will be of value in clarifying questions to be discussed in later chapters of this report. We shall consider here only cereals, which form the great bulk of the food of the population, the most important being rice, wheat, millets, barley and maize. It is to be observed that before the war India was not self-sufficient in cereals, a small exportable surplus of wheat being offset by large imports of rice.

Imports and exports of rice and wheat.

(In millions of tons). exports + imports —.

Five years ending	Rice.	Wheat.
1937–38 (average)	— 1·72	+ 0·20
1938–39	— 1·25	+ 0·19
1939–40	— 2·14	— 0·02
1940–41	— 1·09	+ 0·12
1941–42	— 0·71	+ 0·26
1942–43	+ 0·26	+ 0·03

On the fall of Burma in the early part of 1942, imports of rice ceased. The areas most affected were parts of the provinces of Bombay and Madras, and the States of Cochin and Travancore.

2. Certain provinces in India are net exporters of cereals in normal times. They are, the Punjab, the Central Provinces and Berar, Sind, Orissa and Assam:—

(i) *The Punjab* is normally a large exporter of cereals. These exports consist in the main of wheat but also include rice, millets and barley. The wheat crop harvested in 1943 was a bumper one and the rice, millet, maize and barley crops were good. In 1943 the province had an unusually large exportable surplus.

(ii) *The Central Provinces and Berar* also normally have an exportable surplus. This area had an excellent rice crop in 1942–43, while the millet crop was slightly above, and the wheat crop below, the normal. There was no shortage in this province in 1943; it had in fact a considerable exportable surplus of rice.

(iii) *Sind* is another surplus province. In 1942–43 the exportable surplus amounted to about 30 per cent of the provincial yield of foodgrains.

(iv) *Orissa* normally has a surplus of rice and during the period, 1st December 1942 to 31st October 1943, exported about 100,000 tons. This was accomplished in spite of a poor harvest. Although the province as a whole had a surplus in 1942–43, there was serious distress accompanied by some deaths from starvation in the four coastal districts of Balasore, Cuttack, Puri and Ganjam. This was due, first, to the damage caused by cyclones in October and November 1942, secondly, to floods in August 1943, and finally, to the steep rise in prices during the free trade period which had the effect of placing rice beyond the reach of the poor. In our report on Bengal we have described health conditions in Orissa during the famine year.

(v) *Assam* has an exportable surplus of rice and imports a small quantity of wheat. The volume of the rice surplus cannot be determined accurately because the exports by country boat are not recorded. The rice crop of 1942–43 was a good one and there was no shortage in 1943.

3. The deficit provinces, apart from Bengal, are the North-West Frontier Province, Bihar, the United Provinces, Madras and Bombay.

(i) *The North-West Frontier Province* is normally slightly in deficit. It imports about 25,000 tons of wheat and 8,000 tons of rice, and exports approximately 15,000 tons of barley. There was no shortage in 1943; this was largely due to a bumper wheat crop.

(ii) *Bihar*, in normal times, is deficit in rice as well as in wheat. During the four years 1937–38 to 1940–41, the average annual imports were approximately 200,000 tons of rice and 71,000 tons of wheat and wheat products. In addition, the Bihar Government estimate that 74,000 tons of rice, in the form of paddy, were received yearly from Nepal. The following table shows the estimated yield of the rice, wheat, maize and barley crops in Bihar for the four years ending 1942–43:—

('000 tons.)

Year.	Rice.	Wheat.	Maize.	Barley.
1939–40 ..	3,178	424	441	405
1940–41 ..	2,134	405	393	446
1941–42 ..	2,747	485	456	445
1942–43 ..	3,256	581	558	416

It will be noticed that the yield of the rice, wheat and maize crops in 1942–43 was very good. During the free trade period, May to July 1943, prices rose steeply and the Government, in order to assist the poorer classes, opened numerous "poor" shops at which foodgrains were sold at cheap rates. On the abandonment of free trade, Government were able to regain control and prices fell rapidly. The only supply which Bihar received under the

Basic Plan in 1943 was about 20,000 tons of wheat. Apart from the rise in prices, consequent on the introduction of free trade, the supply position in Bihar during 1943 was not unsatisfactory, and in the latter part of the year 50,000 tons of rice were supplied to Bengal.

(iii) *The United Provinces*, taking all cereals together, normally has a small deficit of about 50,000 tons. The province is, however, heavily deficit in rice, the average imports amounting to about 174,000 tons. The production of the main cereals in 1942-43 was satisfactory. A procurement organization was set up in March 1943 and the Provincial Government were able to ensure supplies to the urban centres, and in addition, to provide over 160,000 tons of cereals for deficit provinces and the defence services.

(iv) (*a*) *Madras* is normally deficit in rice, wheat, and millets. During the four years ending 1940–41 and the five years ending 1941–42, the average yearly imports of rice were about 350,000 tons and 260,000 tons respectively as against an average production of approximately 4·7 million tons. The imports came chiefly from Burma. During the same period the average yearly imports of wheat from other parts of India were about 65,000 tons, as compared with an annual production of only 2,000 tons. The recorded net imports of jowar and bajra were small, about 10,000 tons, but in addition, there were unrecorded imports of ragi and other millets from the States of Mysore and Hyderabad into the adjoining districts of the province. The shortage in the supply position created by the stoppage of imports of rice from Burma in the spring of 1942 was aggravated by two factors. First, Ceylon, the States of Travancore and Cochin, and the province of Bombay, in normal times, depend largely on imports from Burma and on their cessation purchases for export to these areas began to be made in the main rice producing areas of Madras. Secondly, parts of the Ceded Districts of Bellary, Anantapur and Kurnool suffered during 1942 and 1943 from a serious famine consequent on the failure of the south-west and the north-east monsoons in 1942.

(*b*) In May-June 1942 purhases of rice for export led to a steep rise in prices and the Provincial Government endeavoured to bring the situation under control by allocating export quotas to the buying areas, and prohibiting exports from the province except under permit. These steps did not, however, prove entirely successful and in September 1942 an official purchasing organization was set up in the main surplus rice areas for the purpose of undertaking all buying for export outside the province and for the defence services. Later, in February 1943, the work of this agency was extended to the purchase of supplies of rice for deficit areas in the province. The surplus rice areas are situated in the north and south deltas. They are well provided with irrigation canals, and in consequence, are protected against crop failures. Procurement operations in these areas were very successful and enabled the Provincial Government to obtain control of large

supplies of rice. During the period December 1942 to October 1943, more than 700,000 tons of rice were purchased on Government account. The rice purchased was largely used for meeting the needs, as far as possible, of the deficit areas in the province, partly for the defence services, and partly for assisting the neighbouring provinces and states.

(*c*) The rainfall in the three districts of Bellary, Anantapur, and Kurnool is uncertain and, in the absence of protective irrigation works, these areas are very liable to famine. Both the north-east and the south-west monsoons of 1942 failed and famine conditions prevailed in large areas of these districts during the greater part of 1942 and 1943. The population of the affected areas was nearly 1·2 millions and it has been estimated that about 400,000 persons were in receipt of relief during the famine. Numerous famine relief works were started and arrangements made for the import of foodgrains into the affected areas from other parts of the province as well as from outside the supply of grain to famine camps. This was necessary as workers found it difficult to buy grain in the markets. Over 20,000 tons of millets were supplied to the famine camps. The expenditure on relief operations was heavy, amounting to Rs. 2,18,00,000. Although there was great distress among the poorer sections of the people, the famine did not cause exceptional mortality.

(*d*) The supply position in Madras in 1943 was, therefore, one of considerable difficulty. The quantities of foodgrains received from other provinces and states under the Basic Plan during 1943 were not large, being as follows:—

	Tons.
Rice [1]	33,000
Paddy	9,700
Millets	72,400
Wheat and wheat products	47,600

The situation was kept under control very largely owing to the success of the procurement operations in the surplus rice areas of the north and south deltas. Another factor, which also assisted, was the existence of reserves in the hands of the cultivators in the millet producing and consuming areas. Rainfall is uncertain in the "dry" areas of the province, and the cultivators in these areas are accustomed to keep reserve stocks of millets as an insurance against poor harvests in years of deficit rainfall. The existence of these reserves was a factor of some importance in 1943. The higher prices then prevailing induced the cultivator to sell part of his reserve, and this additional supply was useful not only in assisting the famine-stricken areas but also in increasing the flow of supplies to markets in other parts of the province.

(v) (*a*) *Bombay* normally is deficit in rice, wheat and millets. This is largely due to the demands of the urban areas, Bombay city, Sholapur, Ahmedabad, Poona, and other towns.

[1] As against these receipts Madras supplied 114,000 tons of rice to Ceylon and neighbouring provinces and states.

The following table shows the average annual imports and production of cereals during the five years ending 1941–42 as well as production in 1942–43:—

Average of the five years ending 1941–42.

	Imports. ('000 tons).	Production. ('000 tons).
Rice	295	756
Wheat	147	303
Millets (jowar and bajra)	54	1,795
	496	2,854

Yields during 1942–43.

	('000 tons).
Rice	928
Wheat	215
Millets (jowar and bajra)	1,682
	2,825

(*b*) As in the case of Madras, imports of rice came chiefly from Burma, and those of wheat from other parts of India. Again, as in Madras, the supply position in 1943 was complicated by scarcity and famine in certain districts in which, owing to uncertain rainfall and the absence of irrigation, crops are liable to periodic failure. On the other hand, the supply position in Bombay was eased by the fact that as against a normal deficit of about 496,000 tons, the province received during the *kharif* year 1942–43 (December 1942 to November 1943) and the *rabi* year, 1943–44 (April 1943 to March 1944) a total quantity of 431,000 tons of foodgrains.

	Tons.
Rice and paddy	84,000
Wheat	230,000
Millets	117,000
	431,000

The supply problems with which the Government of Bombay were faced in 1943, were, first, the feeding of Bombay city and other industrial areas, and secondly, the provision of supplies to certain areas in which scarcity and famine prevailed owing to the failure of the crops.

(*c*) When prices rose in 1942 the Provincial Government began to acquire stocks for distribution in Bombay city. By the end of the year the only supplies which were not distributed under Government control were about 4,000 maunds (147 tons) of rice a day. In December 1942, the conclusion was reached that rationing would have to be introduced, in January 1943 preliminary administrative arrangements were made, and on 1st May 1943 rationing was introduced in the city. The necessary supplies,

wheat, millets and rice, were obtained largely from outside the province, and partly from the surplus rice areas of Colaba and Thana.

(*d*) In 1942 the activity of the monsoon declined towards the end of August and there was practically no rain after the middle of September, except for scattered showers in the south of the province late in December. The early cessation of the monsoon seriously affected the cultivation of *rabi* crops, particularly in the eastern parts of the South Deccan and the Karnatak. These areas had experienced scarcity conditions in the previous year and the failure of the *rabi* crops in 1942–43 resulted in a serious shortage of food and fodder. The area which suffered most was the Bijapur district where famine conditions prevailed from November 1942 to December 1943. There was also scarcity, not amounting to famine, in parts of the districts of Dharwar, Belgaum, Satara, and Sholapur during 1943. The total population affected by scarcity and famine was 1,500,000—950,000 in the Bijapur district and 550,000 in other districts.

Great difficulty was experienced in supplying grain to the affected areas. This was specially so towards the end of 1942 and during the early months of 1943 when foodgrains were very scarce in Bombay city and only small supplies were received from outside the province. The supply position in the Bijapur district was particularly acute and it was found necessary first, to supply millets at subsidized rates from November 1942, and secondly, to ration the whole district from 1st July 1943 on the basis of $\frac{3}{4}$ lb. of cereals per adult per day. These supplies were provided in bulk to villages and distributed either by reliable local merchants or by village revenue officers under the supervision of local non-official committees. In other areas, fair price shops were opened for the sale of grain to the poor on the basis of one rupee worth of grain per family per week. The usual measures, including relief works, prescribed by the Famine Code were also undertaken. By the end of 1943 agricultural conditions had greatly improved and the declarations of famine and scarcity were withdrawn. The relief measures undertaken were successful in preventing any exceptional mortality.

(vi) *Bengal* is normally deficit in rice and wheat. The average annual net imports of rice according to the recorded statistics for the five years ending 1941–42 were approximately 132,000 tons. In addition, there were unrecorded imports by country boat from Assam and from Arakan in Burma; the amount of these imports is not known with accuracy. The average annual net imports of wheat for the same period were 249,000 tons. The imports of rice were chiefly from Burma and those of wheat mainly from other parts of India. We have dealt with the supply position in Bengal in 1943 in our report on that province.[1] It will suffice to say that the *aman* rice crop reaped in November and December 1942 was a very poor one.

[1] Report on Bengal, Part I, Chapter III, section C.

4. (*a*) The States of Travancore and Cochin in normal times are dependent largely upon imports of rice from overseas, chiefly from Burma. The exact amount of these imports is not known and various estimates have been made. The State of Travancore estimates that on the basis of an average yearly consumption of 275 lb. of rice for 75 per cent of the population, that is, adults, and 68¾ lb. for the remainder, the annual requirements are 617,000 tons. The annual production is estimated at 250,000 tons and on these figures the deficit becomes 367,000 tons. On the same basis annual consumption in Cochin would be about 150,000 tons. Production is estimated at about 86,000 tons, thus giving a yearly deficit of 64,000 tons. Calculated in this manner, the annual deficit for both the States works out at about 430,000 tons. It is, however, doubtful whether the pre-war imports were as large as this; they were probably less. But whatever the actual figure was, it is clear that in these States, the deficit was very large.

(*b*) On the loss of imports from Burma the supply position in both States became extremely difficult. At first, supplies were received from Madras, 95,000 tons of rice being despatched by that Province between July 1942 and January 1943. Later in 1943, the Basic Plan came into operation and during 1943–44 the two States received supplies as follows:—

Between December 1942 and November 1943 —
Rice 141,000 tons.
Millets 24,000 tons.

Between April 1943 and March 1944 —
Wheat 138,000 tons.

(*c*) Both the States took drastic action to conserve and control internal supplies. Early in 1943 private trade in rice and paddy was prohibited and measures were introduced which gave the Governments not only a monopoly of purchase of the surplus paddy of all producers, but also required producers to sell the whole of their surplus grain to Government at the prescribed price. The Travancore Government have gone a step further and every producer, whether he has a surplus or not, is required to sell to Government, for general distribution, a prescribed proportion of his produce. Further, the distribution of foodgrains was brought entirely under Government control and during 1943 rationing was introduced throughout the two States, in rural as well as in urban areas. In Travancore, in October 1944, the ration for adults was roughly 14 oz. of foodgrains, per day, of which about 8 oz. was rice, 5 oz. wheat at 1 oz. other grains. In Cochin the ration was somewhat smaller, being about 12 oz. of foodgrains per day. As in Travancore, this was composed partly of rice, and partly of other foodgrains.

(*d*) Tapioca is produced in large quantities in both the States. Its cultivation has been greatly extended during the last three years, that is, since the shortage in the rice supply became acute. It is cheap and is therefore within reach of the poorer classes who, in spite of its inferior nutritive qualities, prefer it to wheat and millets. The Governments of the two States recognized the

importance of tapioca as a substitute for rice and its export was prohibited in 1942. There is no doubt that the presence of this alternative food and its increasing supply have been important factors in ameliorating the position created by the serious shortage in the supply position of rice.

5. The *Deccan States* are adjacent to and interspersed with the districts of Bijapur, Dharwar, Sholapur and Satara in the Province of Bombay. In 1943 the *rabi* crops in these States, like those in the adjacent areas of the Province of Bombay, were seriously affected by the early cessation of the monsoon and there was a serious shortage of food and fodder. Under the Basic Plan they were given supplies amounting to 61,000 tons of foodgrains in 1943 and 109,000 tons in 1944.

6. In conclusion reference should be made to imports from overseas and the supplies for the defence services in 1943.

Imports during 1943.	Tons.	*Supplies to defence services.*	Tons.
Wheat	273,000	Rice	176,000
Barley	98,000	Wheat	500,000
		Barley, millets and maize	46,000
	371,000		722,000

CHAPTER II.—THE GROW MORE FOOD CAMPAIGN

Early in 1942 the Indian Central Cotton Committee and the Advisory Board of the Imperial Council of Agriculture Research made recommendations for growing more food. The Government of India in April 1942 called a "Food Production Conference" with the object of concerting measures for the increased production of foodgrains in India. The conference was attended by representatives of the provinces and the states and was presided over by the Member in charge of the Department of Education, Health and Lands of the Government of India. The conference viewed with grave concern the shortage of food which was likely to face the country largely because of the loss of imports of rice from Burma, and recommended that a planned drive for the increased production of food and fodder crops should be immediately initiated. The measures recommended by the conference may be tabulated as follows:—

(i) An increase in the area under food and fodder crops by—

(*a*) bringing new land, including fallow land, under cultivation;

(*b*) double cropping; and

(*c*) diverting land from non-food crops to food crops.

(ii) An increase in the supply of water for irrigation by the improvement and extension of existing irrigation canals, the construction of additional wells, etc.

(iii) The extended use of manures and fertilizers.

(iv) An increase in the supply of improved seeds.

Since 1942 the Grow More Food campaign has been conducted on these lines by the Central Provincial and State Administrations. We propose to review the measures taken and the results achieved, not with the object of pointing out what should have been done or not done, but with the object of drawing lessons for the future.

2. The following grants and loans have been sanctioned by the Central Government to the provinces and states in aid of Grow More Food schemes:—

(In lakhs of rupees.)

Year.	Loans.	Grants from Central revenues.	Grants from the Cotton fund.
1943–44	164·4	69·8	14·8
1944–45	129·1	162·0	23·3
Total ..	293·5	231·8	38·1

Figures showing the expenditure incurred by Provincial and State Governments are not available, but as grants are generally not made on a basis more favourable than 50:50, the figure for grants may be taken as involving an equal expenditure from Provincial

and State revenues. The details of the grants and loans made by the Central Government are given in the statement at the end of this chapter.

Extension of Cultivation

3. In the absence of statistics, the majority of the provinces have not been able to supply information as regards the area of waste land brought under cultivation since the launching of the campaign. According, however, to information supplied by the Governments of Bombay, the United Provinces and Orissa, the area of new land brought under cultivation in these provinces is approximately 163,000 acres, 140,000 acres, and 100,000 acres respectively.

The chief reasons why culturable waste land is not cultivated are as follows:—

(i) lack of water;

(ii) lack of drainage;

(iii) unhealthy conditions, chiefly due to malaria;

(iv) deep-rooted grasses and weeds;

(v) low fertility of the soil;

(vi) salinity and alkalinity; and

(vii) liability to damage by wild animals.

The pressure of population on the land in India is very great and the area of culturable but uncultivated land which can be brought under cultivation without the application of special, and in the majority of cases, expensive measures, is small. Irrigation canals involve heavy capital outlay and cannot be built in a day. There is also a limit to the rate at which wells, tube or open, can be constructed, particularly in conditions created by the war. Protection against wild animals presents difficulties and the restriction on the supply of cartridges imposed by war conditions has resulted in an increase in the numbers of wild pig and deer. Land covered with jungle cannot be brought under cultivation without labour and capital. Deep-rooted grasses cannot be eradicated without the assistance of tractors. The draining of marshy lands is frequently an expensive and technical matter. And finally, unhealthy tracts present problems of peculiar difficulty. It is, therefore, unlikely that the area of new land brought under cultivation within a short period of two or three years has been large. It would be surprising if it were so.

The measures taken to encourage the bringing of new land under the plough have been various, such as, interest-free loans, rent-free leases for a term of years, rebates on assessment of land revenue, the supply of water for irrigation free or at concessional rates, the supply of seed at cheap rates, and the amendment of tenancy laws in some areas so as to enable *zamindars* to settle *darkhast* lands without affecting their rights thereto.

Considerable areas are also classed as "fallows." These are usually of such low fertility that they cannot be cultivated every

year and must be allowed to lie fallow after yielding crop for two or three years. Some of this fallow land has, however, been brought under regular cultivation owing to the high prices now prevailing for agricultural produce. Statistics are not available showing the area of fallow land brought into regular cultivation.

Double Cropping

4. The area of double-cropped land has extended considerably, the reported increase in British India being 3·5 million acres, as compared with the average for the six years ending 1941-42. All provinces except Bombay and the North-West Frontier Province show an increase in the double cropped area. High prices have been the main incentive for this increase. Soil moisture is essential for success in double cropping and hence the lands which carry two crops are chiefly rice land or land which can be irrigated from canals, wells or tanks. Double-cropped land also usually requires generous manuring. In various provinces double cropping has been encouraged by loans and subsidies for the construction of wells, tanks and small irrigation projects.

The Diversion of Land from Non-food to Food Crops

5. (i) The entry of Japan into the war closed the Far-Eastern market to Indian cotton. This created a serious position for the growers of short staple cotton and special measures were taken to reduce the acreage under that type of cotton with the double object of preventing the cotton market in India from being flooded with "unwanted" cotton and increasing the production of foodgrains. A Cotton Fund was created in 1942 out of the proceeds of an additional customs duty on the imports of raw cotton. The object of this fund was to enable Government to take steps for the relief of the situation arising out of the stoppage of cotton exports to Japan by *inter alia* financing measures designed to assist the cultivator to change over from short staple cotton to other crops. Bonuses have been paid to cultivators on the basis of the reduction in area, and the Government of India have agreed that provinces and states should be reimbursed for the loss incurred in refusing a supply of water for the irrigation of cotton crops, and supplying water at low rates for food crops on land which had peviously been under cotton. Manure and seed have been provided free or at concession rates for land diverted from cotton to foodgrains, and propaganda was undertaken on a wide scale urging a reduction in the area under short staple cotton. The result of these measures was that the all-India area under cotton fell from 24·2 million acres in 1941–42 to 19·2 million acres in 1942–43. In 1943–44 there was an increase to 20·4 million acres, but the acreage under cotton was still nearly 4 million acres less than in 1941–42. The forecast of the area under cotton in 1944–45 indicates a large reduction as compared with the previous years, and we understand that the Indian Central Cotton Committee has recommended that the area under cotton should be reduced to 16 million acres. The food crops grown in place of cotton are bajra and jowar.

Legislative action has also been taken with the object of reducing the area under cotton. The Government of Madras have taken power to restrict compulsorily the acreage under certain varieties of short staple cotton. In Bombay legislation has been passed to control the areas under foodgrains and non-foodgrains. In Hyderabad (Deccan) a tax equivalent to double the land revenue has been imposed on land under cotton and a sales tax levied on all sales of cotton. The States of Baroda and Nawanagar have also compulsorily restricted the area under short staple cotton.

It should be recognized that while cotton is classified as a non-food crop it produces an important feed for cattle in the form of concentrates, cotton seed and cotton seed cake, and the oil is also used as one of the raw materials in the manufacture of *vanaspati* [1]. The average acreage under cotton during the three years ending 1938–39 was 24·7 million acres; in 1942–43 it fell to 19·2 million acres, a reduction of 5·5 million acres. It is estimated that the yield of cotton seed from 5·5 million acres is 500,000 tons. The loss of this quantity must have considerably reduced the supplies of cattle food which in turn had repercussions on agricultural production and milk supply. The restriction of the area under cotton must be judged with these facts in view.

(ii) Jute is grown in Bengal, Bihar and Assam, but the acreage in the last two provinces is small compared with that in Bengal. For instance, in 1939 the area under jute in Bengal was estimated at 2·5 million acres, whereas the total area in Bihar and Assam was less than 600,000 acres. The alternative crop to jute is rice. In Bengal, though not in Bihar and Assam, since 1941 the acreage under jute has been regulated by Government by virtue of the powers given under the Bengal Jute Regulation Act of 1940. A complete survey of the area under jute was made in 1940–41 and the area registered was nearly 5 million acres. [2] This figure is double the area given in the jute forecast for the previous year. The figure of 5 million acres is now taken as the standard and the acreage permitted to be sown in a particular year is expressed as a fraction of this figure. The actual acreage under jute during the four years ending 1944–45, that is, since the regulation of the jute acreage has been enforced, has been as follows:—

	Million acres.
1941–42	1·5
1942–43	2·7
1943–44	2·1
1944–45	1·7

It is impossible to compare these figures with the estimates of the areas under jute in Bengal during the years preceding 1940–41; they are not comparable. The figures, however, show that the acreage has fallen by one million acres between 1942–43 and 1944–45. This reduction was in all probability due to the high

[1] Hydrogenated oil for human consumption.

[2] We are not in a position to testify to the accuracy of this figure.

price of rice which has encouraged the growing of rice instead of jute, for the prescribed fraction was one half in each of these three years.

The areas under jute in the provinces of Assam and Bihar have also decreased since 1941–42. The figures are as follows:—

	(In thousands of acres.)	
	Bihar.	Assam.
1941–42	242	304
1942–43	233	320
1943–44	202	231
1944–45	163	149

Here again, the decrease is in all probability due in large measure to the high price of rice. Propaganda in favour of growing food crops has also assisted.

IRRIGATION

6. Throughout the greater part of India rainfall is liable to be deficient in quantity and irregular in incidence. For this reason the yield of crops wholly dependent upon rain is much lower than that of irrigated crops. This is shown by the figures in the following statement:—

	(In lb. per acre.)	
Rice.	Irrigated.	Unirrigated.
Madras	1,195	865
Punjab	819	521
United Provinces. ..	1,050	800
Wheat.		
Bombay	1,236	496
Punjab	928	551
Delhi	1,148	656
United Provinces ..	1,050	750

The provision of an assured and regular water-supply is, therefore, a most important factor in increasing the food supply of the country. Such a supply of water not only greatly increases the yield but also enables land which would otherwise be uncultivated, owing to inadequate rainfall, to be brought under the plough. Further, irrigation increases the double-cropped area. From the early stages, therefore, emergency irrigation schemes occupied a prominent place in the Grow More Food campaign. These schemes consist of—

(*a*) the reconditioning of old and the construction of new tanks and open wells;

(*b*) the construction of tube wells fitted with power-driven pumps;

(*c*) the erection of pumping plant for the raising of water from rivers; and

(*d*) minor extensions and improvements to existing canals. Schemes costing several crores have been sanctioned but the additional area brought under irrigation has not as yet been large. We do not say this in any spirit of criticism. Even emergency

schemes take time to complete, particularly in conditions arising out of the war. There are several reasons for this. Departments are short-handed, materials are difficult to obtain, skilled labour is in short supply and above all, delay is inevitable in obtaining machinery.

The Punjab has shown the greatest progress. This is natural as the extensive system of canals in that province offers greater scope for carrying out improvements to existing works. An additional 300,000 to 400,000 acres have been brought under irrigation since the beginning of 1942–43. Further, a scheme for subsidizing the construction of 5,000 percolation wells at a total cost of Rs. 14 lakhs has been sanctioned. In the United Provinces a large scheme involving the construction of 1,000 miles of new channels and 400 tube wells has been sanctioned. It is hoped to complete the scheme by 31st March 1946 when an additional area of 579,000 acres will be brought under irrigation. By the end of March 1945 it was expected that the additional area under irrigation would be 278,000 acres. In addition, a scheme estimated to cost Rs. 11,00,000 has been sanctioned for giving financial assistance to cultivators for the construction of open masonry wells. Interest-free loans and subsidies will be granted up to one half and one quarter respectively of the cost of the wells. In Bombay schemes for the improvement of old wells and tanks, the construction of new wells and tanks, and the construction of *bhandaras* at a cost of over Rs. 30,00,000 have been commenced. These schemes are expected to take three years to complete and to bring under irrigation an additional 10,000 acres in 1944–45 and 20,000 acres in subsequent years. In Sind the re-modelling of old canal systems has enabled 150,000 acres of irrigated land to be leased out for the growing of food crops. In Madras an additional 40,000 acres have been brought under irrigation in the area covered by the Cauvery-Mettur Project. In addition, schemes costing Rs. 74,00,000 have been sanctioned. When completed, these will bring under irrigation about 63,000 acres. In the Central Provinces and Berar a scheme for the construction of a large number of wells has been sanctioned. In other provinces similar schemes, though on a smaller scale, have been sanctioned and are in course of construction.

MANURES

7. The application of manures is a most important factor in obtaining quickly an increased production of food crops, and the Food Production Conference in April 1942 resolved that "arrangements should be made for the supply of manures, particularly oil-cakes and bone-meal; green manuring, where possible, proper storage of farmyard manure and the making of compost should also be encouraged." During the Grow More Food campaign action has been taken to increase the production and the application of various types of manures but little success has been achieved.

The amount of bone meal manure produced and used is small. The Government of Bombay have arranged for the distribution of 500 tons of bone meal to rice-growers in the Konkan district at concession rates. The loss on the scheme, estimated at Rs. 42,000, will be shared equally by the Central and Provincial Governments. The results of this experiment should be valuable.

Green manuring has made little progress, largely because the pressure on the land is so great that many small cultivators cannot afford to sacrifice even a catch-crop in order to grow a crop for green manuring. It is only in Madras, the United Provinces, Orissa and the Punjab that green manuring has been actively encouraged. In Madras the amount of green manure seed distributed is increasing and has now reached a figure of between 30,000 and 40,000 maunds (1,100 and 1,470 tons) a year. In the United Provinces distribution has been at the rate of 40,000 maunds annually, and it is proposed to continue distribution at this rate. In Orissa also seed has been distributed although on a smaller scale. In the Punjab it is proposed to spend Rs. 1,00,000 on the free distribution of seed in the Canal Colonies to encourage green manuring on a wide scale.

A source of manure which presents possibilities is compost prepared from town refuse and night-soil. For the effective production of compost, according to the "Bangalore" process, a trained staff is necessary and in March 1943 the Government of India made a grant of Rs. 2,25,000 to the Imperial Council of Agricultural Research for the purpose of training a staff and inaugurating schemes of production. A staff has been trained and in fifteen Provinces and States the production of compost has commenced. Up to the end of December 1944, 130,000 tons had been prepared of which approximately 20 per cent had been sold. The Government of India are subsidizing sales to the extent of 12 annas per 50 cubic feet in order to enable the disposal to keep pace with production. It is too early as yet to say whether the development of this source of manure will prove a success. One difficulty is the prejudice which exists in certain parts of the country, regarding the use of manure incorporating nightsoil.

Several Provincial Governments have made special efforts to popularize the use of oil-cake as manure. The steps taken have been to control movements and prices and to subsidize sales for manurial purposes for food crops. In Madras the cost of internal transport, storage and distribution is met by Government. In the United Provinces, Bengal, Bombay, Bihar, the Central Provinces and Berar and Orissa, oil-cake has been sold for food production purposes at concession rates. One difficulty in the extension of the use of oil-cake as manure is that it is also a valuable cattle-feed and in some areas the whole of the supply is used in this manner with the result that none is available for use as manure.

The imports of chemical fertilizers in 1939 were about 100,000 tons. During the first year of the war, although imports were restricted, consumption was not seriously reduced owing to the existence of considerable stocks in the country. During the years 1942 and 1943, however, the quantities of chemical fertilizers available for agricultural purposes progressively decreased, and at the beginning of 1944 the quantity available was limited to the amount produced within India, that is, about 20,000 tons annually. The Government of India accordingly arranged to import supplies and succeeded in obtaining 76,000 tons in 1944 and 34,000 tons early in 1945. It is hoped that larger quantities will be available later this year (1945) and in the early part of 1946. The restriction on the supplies of artificial fertilizers has undoubtedly been a great handicap to the Grow More Food campaign.

Distribution of Improved Seed

8. As improved seed gives an increase in yield of as much as 5 to 10 per cent, the distribution of such seed was undertaken as an important part of the Grow More Food campaign. The principal agencies for the multiplication of improved seed are the Agricultural Departments of the Provincial Governments and registered growers working under their supervision. Improved seed is the result of long-term research and only small quantities are produced in the first instance. This nucleus is then multiplied at Government farms and further multiplied by registered growers working under the supervision of the Agricultural Departments. In these conditions the rapid expansion in the quantity of improved seed available for distribution offers difficulties. Nevertheless, it has been possible to produce and distribute an additional quantity sufficient to cover an area of about 4 million acres. It is, however, probable that some of this seed has not been up to the requisite standard. Large quantities have been distributed at concessional rates.

Vegetables

9. In urban areas and those parts of the country where military forces are stationed the supply of vegetables has not been equal to the demand and prices have risen to very high levels. Before the war the greater part of the seed for the European types of vegetables and even for some of the Indian types was imported from abroad. This supply was largely cut off by the war and in 1943 and 1944 the Government of India made arrangements for the import of seed from America. A seed farm has also been established in Baluchistan and arrangements made in Kashmir for the acclimatization of vegetables of the European type and for the production of seed on a large scale. During the last two years the army authorities have established farms in different parts of the country for the provision of vegetables for the troops and in addition, Provincial Governments, in conjunction with the military authorities, have prepared and put into operation

schemes for the production of European and Indian vegetables. The underlying idea of these schemes is that if the army demand can be met by these special arrangements the ordinary civil sources of supply will be adequate to meet the civil demand. In spite of these efforts the total demand, civil and military, in 1944 still exceeded the supply in some areas, while in others more vegetables were produced than could be consumed and prices dropped sharply. During 1945 it is expected that the Army will be largely self-supporting in fresh vegetables, including potatoes, and the position should further improve.

CATTLE

10. Draught animals are used for all agricultural operations in India and are therefore indispensable to the agricultural economy of the country. With the exception of the Punjab, the United Provinces, and Sind, the cattle position shows signs of deterioration and there are complaints of shortages, particularly of plough cattle. The prices of cattle are very high and many cultivators find it difficult to replace losses. In Assam the position is described as acute and in Bengal a serious shortage is reported. Bengal lost a large number of cattle in cyclone and during the famine, and these losses have contributed to the serious shortage in that province. Apart from this special contributory cause in Bengal, the reasons for the deterioration in that and other provinces are, however, not clear. It has been suggested that when foodgrain prices rose there was a time-lag during which cattle prices did not rise proportionately. This made the maintenance of young stock unremunerative with the result that young animals were slaughtered. Another reason advanced is that the reduction in mechanical transport and the restrictions on railway booking of goods over short distances have increased the demand for bullocks for road traffic. Extension of cultivation also has been put forward as a cause. A further reason adduced is the increased slaughter of cattle for food purposes, particularly for army demands. The prohibitions, except under permit, on the export of cattle from the provinces and states, which were in normal times exporters of cattle, have also no doubt complicated the situation. There is no evidence that as yet the shortgage has affected agricultural operations in any province. But the danger exists that further deterioration may result in a reduction in the area under food crops, especially in those provinces which are normally importers of cattle from other parts of India.

The military authorities have placed restrictions on the slaughter of cattle for army purposes and it is unlikely that the army demand is any longer a contributory cause. Apart from this, the only step taken to remedy the situation has been to place general restrictions on the slaughter of young stock, draught bullocks and cows. A census was carried out in January this year (1945) throughout India and when these figures are compiled the

extent of the shortage, if there is a real shortage, should be known. [1] The difficulty, however, is that if a shortage exists there are no means by which it can be made good within a short period.

AGRICULTURAL IMPLEMENTS

11. Since the outbreak of war there has been a considerable shortage in the supply of iron and steel for replacing and making agricultural implements and machinery. The Government of India estimates that 25,000 tons of iron and steel per quarter are required to meet the minimum demand of the country for the manufacture and repair of agricultural implements. It has, however, not been possible to secure this amount. There is no evidence that the shortage of iron and steel has so far adversely affected agricultural operations, but the danger exists that unless an adequate supply for the manufacture and replacement of agricultural implements, and for axles and tyres of carts, can be made available, it may become difficult to maintain the present level of agricultural production.

In 1943 it was estimated that it was essential to import, during 1944, 151 tractors of which 81 were required for purposes of land development, particularly for the eradication of deep-rooted grasses. Out of these, 19 tractors have been received. In 1944 it was estimated that for 1945 and the first six months of 1946 the needs of the Provincial and State Governments would be 490 tractors, of which 160 were needed for weed-eradication. These are in addition to those which will be imported under licence by the trade. It is, however, not yet known how many of these tractors will be received.

PRODUCTION OF CEREALS AND PULSES

12. (i) *Rice*—

	Area.		Yield.	
	In million acres.		In million tons.	
	1942–43.	1943–44.	1942–43.	1943–44.
All-India excluding Bengal ..	51·9	53·4	17·9	18·8
Bengal	23·3	24·6	7·0	10·3

As we have explained in our report on Bengal, the figures in 1943–44 for Bengal are not comparable with those of previous years.[2] For this reason we have shown the figures for Bengal and the rest of India separately.

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[1] The figures for the United Province are—

	(In thousands.)	
	1935.	1944.
Bullocks	10,153	10,230
Cows	6,005	5,343
Young stock	7,019	5,524

[2] Report on Bengal, Part III, Chapter I, paragraph 1.

There was an excellent monsoon in 1943–44 and the rice crop throughout India was a very good one. This no doubt was an important factor contributing to the large acreage and the high yield of that year. The previous highest recorded acreage, during the last ten years, for all-India excluding Bengal, was 52·4 million acres in 1938–39, that is, 1 million acres less than in 1943–44. The highest recorded yield during the same period was 18·4 million tons in 1936–37. Compared, therefore, with 1936–37 the yield in 1943–44 was higher by 400,000 tons.

The conclusion we draw from these figures is that the large acreage in 1943–44 was not due entirely to a favourable monsoon but that there was what may be called an " absolute " increase in acreage of about 1 million acres. This increase was due partly to the incentive of high prices and partly to the activities of the Grow More Food campaign.

The crop in Bengal in 1943–44 was an excellent one, probably the best ever reaped in the Province.

(ii) *Wheat and barley.*—The all-India figures of acreage and yield are as follows:—

	Average of three years ending 1938–39.	Average of three years ending 1941–42.	1942–43.	1943–44.
		Area in million acres.		
Wheat	34·8	34·3	34·4	33·7
Barley	6·3	6·3	6·8	6·7
		Yield in million tons.		
Wheat	10·2	10·3	11·0	9·7
Barley	2·1	2·1	2·2	2·2

The area under wheat is steady and the figures for the two years 1942–43 and 1943–44 give no indication of an increase in acreage in those years as compared with the previous six years. Although the wheat crop in 1942–43 was a bumper one due to favourable weather conditions, that in 1943–44 was sub-normal consequent on unfavourable weather conditions, particularly towards the end of the growing season. The conclusion seems to be justified that in spite of the steps taken under the Grow More Food campaign to increase the acreage under wheat and the incentive of high prices, the wheat acreage has not materially increased.

The acreage under barley increased slightly during the two years 1942–43 and 1943–44 as compared with the average of the previous six years. There was, however, no corresponding increase in recorded outturn, the yield in the two years 1942–43 and 1943–44 being practically the same as the average of the preceding six years.

(iii) *Jowar and bajra.*—The all-India figures of acreage and yield are as follows:—

	Average of three years ending 1938–39.	Average of three years ending 1941–42.	1942–43.	1943–44.
	Area in million acres.			
Jowar	34·8	33·7	35·9	36·0
Bajra	16·9	17·9	22·2	21·1
	Yield in million tons.			
Jowar	6·8	6·8	6·7	6·7
Bajra	2·6	2·9	4·0	3·7

The area under jowar in the two years 1942–43 and 1943–44 showed an increase of about 2·3 million acres as compared with the average of the three years ending 1941–42. The increase in acreage was, however, not accompanied by an increase in the yield, the recorded yield in the two years 1942–43 and 1943–44 being practically the same as the average of the previous six years.

The area under bajra in the years 1942–43 and 1943–44 showed a large increase as compared with the average of the previous six years, the increase being of the order of about 4 million acres. The yield also increased, the average of the two years 1942–43 and 1943–44 being about 1 million tons greater than the average of the previous six years.

(iv) *Maize.*—The all-India figures are—

	Average of three years ending 1938–39.	Average of three years ending 1941–42.	1942–43.	1943–44.
Area (million acres) ..	6·3	6·3	6·9	6·9
Yield (million tons) ..	2·0	2·1	2·4	2·4

The area under maize increased by about 600,000 acres in the years 1942–43 and 1943–44 as compared with the average of the previous six years. The yield was also higher by approximately 350,000 tons.

(v) *Ragi.*—Ragi (Eleusine coracana) is a millet which is of considerable importance in Mysore and Madras. The all-India figures of acreage and yield are as follows:—

	Average of three years ending 1938–39.	Average of three years ending 1941–42.	1942–43.	1943–44.
Area (million acres) ..	5·4	5·4	5·5	5·4
Yield (million tons) ..	1·7	1·8	1·8	1·8

The acreage and yield have not varied substantially.

(vi) *The all-India cereal position reviewed.*—Exclusive of Bengal. the area under rice in India in 1943–44 was 1 million acres greater than in any year during the previous ten years. The yield was also the largest during the period, being about 400,000

tons more than in 1936–37. Bengal also had an excellent crop in 1943–44, probably the best ever reaped in that Province. The improvement in the all-India rice crop was due largely, though not entirely, to an excellent monsoon. The monsoon in 1944–45 was not so favourable as in 1943–44 and the yield in the former year will be considerably below that of the latter.

The wheat acreage (all-India) is steady and is not likely to increase unless additional areas are brought under irrigation. There was a bumper wheat crop in 1942–43 but that in 1943–44 was below the normal owing to adverse weather conditions.

The acreage and yield of barley show practically no change.

The area under the *kharif* cereals—jowar, bajra, maize and ragi—has increased by 6·6 million acres, that is, from an average of 63·3 million acres during the six years ending 1941–42 to 69·9 million acres, the average of the two years 1942–43 and 1943–44. The production figures of these cereals for the corresponding periods are 13·3 million and 14·7 million tons respectively, an increase of 1·4 million tons. The increase in the acreage under these crops has taken place largely because of the decrease in the area under short staple cotton.

We may here draw attention to the fact that, apart from an increase in the rice crop in 1943–44, the major part of the increase in cereal production during the two years 1942–43 and 1943–44 was in bajra, the poorest yielder among Indian cereals and the least popular among millets.

(vii) *Pulses.*—Pulses are of particular importance in the nutritional and agricultural economy of India. In nutrition they are an important source of protein in the diet of a vegetarian population. Further, they are of considerable importance as fodder for cattle not only when green but also in the form of hulls and grain.

Gram (*cicer arietinum*) is the most important pulse and in certain parts of the country is consumed as a partial substitute for cereals. The all-India figures are—

	Average of three years ending 1938–39.	Average of three years ending 1941–42.	1942–43.	1943–44.
Area (million acres) ..	14·9	13·5	15·7	15·2
Yield (million tons) ..	3·5	3·3	4·1	3·3

The area under gram during the years 1942–43 and 1943–44 increased by nearly 2 million acres as compared with the average of the three years ending 1941–42. There was a bumper crop of gram in 1942–43 and the yield in that year was about 700,000 tons more than the average of the previous six years. There was, however, a large reduction in the yield in 1943–44 and in that year the outturn was approximately the same as the average of the six years ending 1941–42.

Little information is available as regards the area and yield of other pulses and no special efforts appear to have been made to extend their cultivation under the Grow More Food campaign.

13. In our report on Bengal, we emphasized the great need for an improvement in the supply of supplementary foods, that is, food other than the main cereals. We would once again draw attention to this matter, for we attach the greatest importance to an increase in the supply of these foods. We were glad to note that this matter received special attention at the All-India Food Conference held at the beginning of this year (1945) and was the subject of a separate resolution. Beyond this we have no specific recommendation to make as regards the Grow More Food campaign except that it should be continued with undiminished vigour and without any slackening of effort. The results achieved by this campaign have not been spectacular. This is not surprising. As we have said, the area of culturable but uncultivated land which can be brought under cultivation without the application of special, and in the majority of cases expensive measures, is small. Again, the two main requisites for a large increase in agricultural production are first, an improved water-supply, and secondly, an increase in the supply and use of manures and fertilizers. But as we have pointed out, schemes for an increase in the supply of water for irrigation take time to complete, particularly in conditions arising out of the war. Further, a large increase in the supply and use of manures and fertilizers presents many difficulties. The lesson to be drawn from the experience of the Grow More Food campaign stands out quite clearly. It is this. A large increase in agricultural production in India by an extension of the area of cultivated land and an improvement in the yield per acre of crops through irrigation and other measures, will not be achieved without intensive and sustained effort on the part of both Government and the people. There is, therefore, need for laying down a clear agricultural policy and providing administrative machinery for its execution.

Statement showing the Details of Loans and Grants out of Central Revenues and the Cotton Fund during 1943–44 *and* 1944–45.

	Name of the Province, etc.	Irrigation facilities.		Land clearance and improvements.		Manure for distribution.		Seed multiplication and distribution.		Compost making.		Bonus to cultivators for diverting areas from short staple cotton to food crops.		Fish production.		Miscellaneous schemes.		Total.	
		Loans.	Grants.	Loans.	Grants.	Loans.	Grants.	Loans.	Grants.	Loans.	Grants.	Loans.	Grants.	Loans.	Grants.	Loans.	Grants.	Loans.	Grants.
		RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1	Ajmer-Merwara	..	..	..	..	7,250	3,000	2,27,000	1,33,716	..	3,900	..	51,181	..	..	..	..	2,34,250	1,91,797
2	Assam	..	2,35,500	..	..	2,10,300	48,417	17,77,667	4,29,900	..	..	..	..	..	..	..	1,76,668	19,87,967	8,90,485
3	Baluchistan	..	38,148	..	..	..	11,000	1,66,400	1,17,016	..	6,938	..	..	..	..	..	19,153	1,60,400	1,92,255
4	Bengal	..	5,67,289	..	..	6,16,000	89,700	79,14,000	13,98,850	..	1,37,512	..	..	..	53,450	..	2,76,000	85,30,000	25,22,801
5	Bihar	..	11,09,000	..	5,76,970	1,92,800	11,00,000	7,71,200	3,06,100	..	..	..	..	..	..	..	2,37,952	9,64,000	23,30,022
6	Bombay	8,22,500	13,24,830	3,00,000	16,00,000	..	8,22,927	..	9,14,719	..	25,000	..	1,17,500	..	..	..	..	11,22,500	48,04,976
7	Central Provinces and Berar	29,34,000	8,99,000	3,48,970	1,47,985	22,86,000	8,21,000	15,00,000	4,62,166	..	..	..	..	..	..	..	50,000	70,68,970	23,80,151
8	Coorg	..	..	..	41,250	..	6,000	..	..	..	300	..	..	..	..	..	7,200	..	54,750
9	Madras	..	9,76,250	16,25,000	2,02,466	19,00,000	6,66,833	26,00,000	7,75,626	..	..	..	3,18,466	..	77,200	..	3,40,571	61,25,000	33,57,412
10	North West Frontier Province	..	10,21,000	..	..	..	..	12,74,009	1,60,500	..	..	..	..	..	..	..	9,668	12,74,000	11,91,168
11	Orissa	3,73,500	2,45,600	8,22,000	1,33,900	1,39,300	1,14,250	6,62,100	1,61,667	..	..	..	..	..	24,138	48,000	4,43,336	20,44,900	11,22,891
12	Punjab	..	7,00,000	..	9,00,000	..	15,000	..	..	..	1,93,860	..	..	..	..	..	..	..	18,08,860
13	Sind	..	..	..	..	..	..	..	3,49,335	..	..	..	..	..	..	..	2,24,000	..	5,73,335
14	United Provinces	..	29,83,500	..	1,01,000	..	2,15,000	..	1,71,050	..	1,67,140	..	..	..	40,000	..	16,800	..	36,94,490
15	Imperial Council of Agricultural Research ..	..	..	..	..	..	..	..	75,000	..	2,22,200	..	..	..	..	..	1,37,226	..	4,34,426
16	Baroda State	..	4,02,000	..	82,000	..	33,750	..	80,000	..	..	..	5,53,000	..	..	..	62,000	..	12,12,750
17	Kashmir State	..	..	..	..	..	..	..	16,800	..	..	..	..	..	..	..	..	..	16,800
18	Kutch State	..	..	..	..	..	..	..	..	..	..	..	8,677	..	..	..	..	..	8,677
19	Rampur State	..	..	..	..	..	..	..	..	..	..	..	8,698	..	..	..	..	..	8,698

N.B.—During 1942–43 grants from the Cotton Fund amounting to Rs. 28,83,721 were sanctioned to Provinces and the Indian States.

CHAPTER III.—FOOD ADMINISTRATION IN INDIA DURING THE WAR [1]

Procurement and Distribution

The population of India, about 400 millions including the Indian States, may be roughly divided into three classes: first, the producer-consumer who grows more foodgrains than he needs for his domestic consumption and seed and has a surplus which he normally sells; secondly, the producer-consumer who grows less than he needs and at certain times of the year buys foodgrains from the market; and thirdly, the non-producer-consumer who buys the whole of his needs from the market. In India the vast majority of the cultivators are not capitalist-farmers of the type which constitutes the bulk of the agriculturists in Britain, the United States of America and many other parts of the world, but small producer-consumers cultivating a few acres of land. The foodgrains coming to the market in India, therefore, consist of the individual small contributions of millions of small cultivators, and the problems confronting food administrations in India are first, the control, directly or indirectly, of the flow of these innumerable small streams of grain and the larger streams into which they coalesce, in order to ensure the provision of supplies for the defence services, the urban population and those classes in the rural areas which buy their supplies, in whole or in part, from the market, and secondly, the equitable distribution of the available supplies among the latter two classes of consumers at or within pre-determined price limits.

2. The procurement machinery for the maintenance of supplies of foodgrains in the different provinces does not conform to a uniform pattern. Indeed, no attempt has been made to evolve a procurement scheme applicable to the whole of India, and the schemes in operation in the provinces have developed in the light of local conditions. We are of opinion that this was the correct course, in fact the only course, to follow. Conditions vary greatly throughout India and the adoption of a uniform procurement machinery would have been impracticable. Lack of uniformity has, however, one disadvantage as far as we are concerned. A general description of the procurement schemes in operation is impossible; each scheme must be described separately. We shall now describe, as succinctly as possible, the main features of the schemes in force in the different provinces with the exception of Bengal. We have already dealt with the Bengal procurement plan in our report on that province.

3. *Madras.*—In the province of Madras, there are two main schemes in operation, one in the surplus rice areas situated in the north and south deltas, and the other in the deficit districts of Malabar, Vizagapatam, Tinnevelly, Ramnad, Coimbatore, South Kanara and the Nilgiris.

[1] This chapter was written before the end of the war in the West and the reoccupation of Rangoon. In so far as it deals with the intensification of controls, it should be read together with Chapter VI of Part I.

Exports of rice and paddy from the surplus rice districts are prohibited and by this means Government have acquired a monopoly of purchase for export. Purchases are made by special officers, called Grain Purchase Officers, within ceiling prices fixed by Government. The areas are well supplied with rice mills and normally purchases are made only from the millers, but if there are signs that cultivators are holding back their surplus grain, requisitioning is threatened or resorted to without hesitation. Purchases are made mainly for supplies to deficit districts of the province, rationed towns, the defence services and the railways. Local trade within the surplus rice districts is unrestricted and there has, therefore, been no need for Government to undertake responsibility for internal distribution except in the rationed towns and in certain deficit pockets in the rural areas.[1]

In the heavily deficit districts a system of monopoly of purchase and distribution is in operation. The main features of this system are, first the cultivator is required to sell the whole of his surplus grain to Government at the prescribed price, and secondly, the entire population is rationed. No private trade whatsoever in the monopoly foodgrains is permitted and all movement beyond the village boundary is prohibited. Local traders are used for purchasing grain from the cultivators as well as for distributing supplies to the licensed retailers.

4. *Bombay.*—In Bombay, as in Madras, there are two schemes in operation, one in the surplus rice districts of Thana and Colaba, and the other in those areas of the province in which rice is not the predominant crop. In the surplus rice districts the system, in principle, closely resembles that in operation in the surplus rice areas of Madras. Exports from the areas are prohibited and purchases on Government account are made mainly from the rice mills, of which there is a considerable number. The prices paid by Government for rice and paddy are fixed and remain in force for the whole crop year. The rice millers are required to enter into contracts with Government binding themselves to deliver to Government specified quantities of rice under penalty of forfeiture of the deposit made for the due fulfilment of the contract. Purchases of paddy are also made direct from the cultivator on Government account by Government officers. These purchases are made partly to ensure that the miller does not squeeze the cultivator by paying him a price for paddy lower than that fixed by Government, and partly to assist procurement.

In the areas in which rice is not the predominant crop, a monopoly scheme is in force the main elements of which are, (*a*) a compulsory and graded levy from the cultivator, of a portion of his surplus grain; the levy quota must be sold to Government; (*b*) a Government monopoly of purchase of whatever the cultivator sells over and above the levy quota; (*c*) strict control over

[1] Recently ceiling prices have been fixed for sales for local consumption by merchants licensed under the Foodgrains Control Order.

movement; and (*d*) a Government monopoly of distribution in all rural and urban areas. No private trade in monopoly foodgrains is allowed except that the producer is permitted to sell, within the village, retail quantities for the *bona fide* consumption of the buyer and his family. All movement beyond the village boundary is prohibited except under permit. It is by this prohibition that Government obtain a monopoly of purchase of whatever the cultivator wishes to sell over and above the levy quota. Government is entirely responsible for distribution and both rural and urban areas are rationed. In most districts purchases are effected by Government officers directly from the producer. In some districts, however, co-operative societies are entrusted with the task of making purchases and in others traders are employed as purchasing agents on a commission basis.

5. *Central Provinces and Berar.*—In the Central Provinces and Berar, Government have a monopoly of purchase of all grain offered for sale at declared markets. The sanction by which this monopoly is effected is an order under the Central Provinces and Berar Foodgrains (Control of Distribution) Order prohibiting any person from selling foodgrains in places specified in the order, except to Government or their agents. The monopoly extends to rice (not to paddy), wheat and wheat products, and jowar and jowar products. The system has worked particularly successfully in the surplus rice districts of the Chattisgarh Division. In the jowar and wheat areas, however, it was found necessary, in 1944, to supplement the scheme of monopoly purchase by further measures. In the jowar area a voluntary levy was introduced Cultivators who reaped in the aggregate between 10 and 50 acres of jowar, were asked to make a contribution of 15 per cent of their production, while from those who reaped in the aggregate 50 acres or more, a higher percentage was demanded, ranging from 15 to about 30 per cent. The voluntary levy was quite successful. The wheat crop reaped in 1944 was a poor one and a compulsory levy was introduced in three wheat districts. The levy was intentionally not pitched at a high figure; it began with an amount as low as 5 seers[1] per acre for cultivators with a small acreage and rose gradually to 2 maunds an acre for cultivators with 60 acres or more. The total amount procured in this manner was small, being in the region of about 4,500 tons.

6. *Orissa.*—The scheme which has been in operation in Orissa since the harvest of the rice crop in 1943, aims at directing the flow of all rice and paddy sold in the wholesale market into the hands of Government. It has three essential features. First, the prices of rice and paddy which the producers are entitled to demand and receive, have been fixed for the whole of the crop year. Secondly, the purchase or sale by any person, whether a cultivator or not, of any quantity of rice or paddy exceeding 10 maunds in any one day has been prohibited unless it be by or to a Government Agent. *Thirdly, no person holding a licence under the Food*grains Control Order is entitled to hold a stock of more than

[1] One seer=2·1 lb.

100 maunds of rice and paddy at any one time unless he is an agent or a sub-agent of Government.[1] The object of the exemption of the purchase and sale of quantities up to 10 maunds in any one day, is to enable purchases and sales to continue unhampered in the small village markets and elsewhere as an essential part of the system of distribution in the Province. Purchases are made by agents selected from the trade.

7. *Assam.*—In the Assam Valley purchases are made on behalf of Government by a commercial firm. Two commercial firms were also employed in the Surma Valley as purchasing agents for Government. This, however, was not found to work satisfactorily and from the beginning of this year (1945) an official agency has replaced the commercial firms in the Surma Valley. Competitive buying is prevented by stringent control of movement and transport. All rail and steamer transport from surplus to deficit areas is available only to Government and their agents. Transport by road is limited and so far it has not been necessary to control such transport. Stringent control of transport by rail and steamer has enabled Government to purchase the supplies required for the deficit areas and for the defence services.

8. *Bihar.*—The province has been divided into six regions, each in charge of a Regional Grain Supply Officer who makes purchases through authorized agents for internal consumption as well as for export from the province. Strict control over the movement of foodgrains is maintained. Grain cannot be moved by road or river steamer from one region to another or from one district to another without a permit from a Grain Supply Officer. Rice and flour mills are under control and Government have a monopoly of the purchase of the outturn of these mills. Large employers of labour have also been prohibited from buying foodgrains for supply to their employees, except in accordance with directions issued by a District Magistrate.

9. *United Provinces.*—For the purpose of procuring foodgrains the United Provinces have been divided into five regions, each of which is largely self-sufficient in all foodgrains taken together. The regions were chosen with this object in view. Procurement operations in each region are in charge of a Regional Food Controller who is assisted by Deputy Regional Food Controllers, Regional and Deputy Regional Marketing Officers, Regional Accounts Officers and Marketing Inspectors. There is also a Provincial Marketing Officer. The actual purchases are made by members of the trade who are appointed for each of the larger markets, to which a number of small adjacent markets are attached. Purchases are made within ceiling prices fixed by Government. As regards movement control no foodgrains of the kind purchased by Government can be moved by rail from one region to another, or from or to the largest 25 towns of the province except under

[1] It is understood that this limit has since been reduced.

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permit. Competitive buying has also been restricted by an arrangement by which employers of labour and the railways receive their supplies from the Provincial Government, and are not allowed to buy in the open market. Purchases by flour mills are also made under the instructions of the Regional Food Controllers.

10. *Punjab.*—In the Punjab purchases for the defence services are made by Messrs. Owen Roberts and Company and those for civil requirements by the Director of Food Purchases, an officer of the Provincial Government. The purchases by the Director of Food Purchases are made in Lahore by means of tenders received from merchants who may or may not, at the time of the tender, be in possession of the grain they offer for sale. A number of firms has been appointed as clearing agents, and the acceptance of a tender by the Director is conditional on one of these clearing agents agreeing to guarantee the tender and to handle the execution of the contract. In addition to the Director of Food Purchases there is a staff of Grain Purchase Officers, Inspectors and Godown Supervisors stationed in the districts. The original intention was that the Grain Purchase Officers should receive tenders locally and accept them in consultation with the Director. This has not, however, materialized and the district staff is now chiefly employed in connection with the Provincial Reserve. This amounts to between 40,000 and 50,000 tons and is held largely at the places at which it is purchased. It is maintained partly by purchases made under the tender system in Lahore and partly by purchases made in the markets through commission agents under the supervision of the Grain Purchase Officers.

11. *Sind.*—In Sind procurement is in the hands of two syndicates. That in charge of the purchases of wheat consists of representatives of the flour mills of Karachi and is known as the Wheat Syndicate. The other syndicate which deals with foodgrains other than wheat, was until the end of 1944 a body representative of the Buyers and Shippers Chamber, Karachi, and consisted of recognized dealers in rice, millets and gram. The procurement operations of the syndicates were subject to a good deal of public criticism and complaints of corruption and dishonesty were made. This culminated in December 1944 in the replacement of the syndicate dealing with rice, millets and gram by a Purchasing Board consisting of 18 members (9 Muslims and 9 Hindus) and a Chairman. The Managing Directors of the Board are experienced grain merchants. No change was made in the Wheat Syndicate. In addition, there is a syndicate which supplies the rationed area of the city of Hyderabad. This is in the form of a co-operative society consisting of growers, dealers and sellers.

Before the current season (1945–46) wheat was purchased at market rates but since April 1945 prices have been fixed for the whole crop year. For rice also prices have been fixed for the whole crop year. In addition to the fixed price, a holding or storage charge is paid to the producer or merchant in the case of deferred delivery contracts.

12. *North-West Frontier Province.*—Barley for export is purchased by Messrs. Owen Roberts & Co. Under an order issued in July 1944, under the Defence of India Rules, every person who possesses more than 150 maunds of the main foodgrains, is required to submit a declaration stating the quantities in his possession, and a Deputy Commissioner is empowered to direct the sale of any quantity in excess of 150 maunds to a Government servant or agent. Internal distribution has been controlled by means of this order.

Monopoly Procurement

13. Since 1943 there has been a steady development on the part of the Governments of some provinces and States towards the "monopoly" procurement of foodgrains. The question of "monopoly" procurement was considered at the Fifth All-India Food Conference held in Delhi in January 1945, which had before it a survey, by an officer of the Food Department of the Government of India, of the schemes in operation in certain provinces and States. The following resolution on the subject was passed by the Conference:—

The results so far obtained in the working of the monopoly procurement system justify their further development so far as the circumstances of each province or State permit.

Where monopoly procurement is in operation in respect of any particular grain, Government should, in the interest of the producers, accept all such grain as is offered, subject to considerations of quality. Acceptance should be at notified centres, at the appropriate stages of the marketing process, and at prices fixed in accordance with the all-India policy after consultation, where necessary, with the Central Government.

The development of monopoly procurement should be in the direction of acquisition by Government of grain offered for sale voluntarily. Nevertheless, in those areas where it is deemed advisable, monopoly procurement may be extended by (i) a compulsory levy and the acquisition, in addition, of any balance that any producer may desire to sell, or (ii) the assessment of the surpluses of individual producers and the compulsory acquisition of such surpluses.

The conference in making this recommendation recognizes that the financial consequences of implementing the policy may necessitate assistance to provinces by the Central Government.

14. From the standpoint of principle, the only completely satisfactory system of procurement and distribution of foodgrains is one in which first, the whole of the surplus of every producer is at the disposal of Government, and secondly, Government are solely responsible for distribution, that is, the entire population is rationed. Such a system is in principle the only completely satisfactory one, because it is only under such a system that the surpluses of surplus areas, the deficits of deficit areas, and the over-all deficit of

India can be accurately estimated and the equitable distribution of available supplies among all classes of the population fully assured. We describe this system as one of " full monopoly."

The scheme in operation in the deficit districts of Madras is one of full monopoly. Similar schemes are also in force in some of the Indian States, for instance, in Travancore, Cochin, Mysore, Kolhapur and the Deccan States. The " levy " scheme in operation in parts of the Bombay Presidency is also for all practical purposes a scheme of full monopoly. As we said in our report on Bengal, these schemes appear to be working satisfactorily though no doubt further experience will indicate lines of improvement.

Full monopoly throws a heavy burden on the administrative machine, already strained by conditions arising out of the war, because it involves, first, the assessment of the produce reaped by millions of small producer-consumers and of their surpluses and deficits, secondly, the purchase and collection of millions of small parcels of grain, and thirdly, the distribution of supplies on a ration basis among the whole population other than those who grow sufficient grain for their own needs.

The first essential for the successful working of a scheme of full monopoly is that the Administration should possess a staff capable of preparing a reasonably accurate estimate of the crop reaped by each cultivator. In Madras and Bombay (and in other parts of India where full monopoly schemes are in operation) such a staff exists in the form of a highly developed revenue establishment. This establishment consists of a revenue staff in each village or group of villages charged with the maintenance of village records and a staff of revenue officers whose duty it is to assist, supervise and control the village staff. As we explained in our report on Bengal, village records are not maintained in that province and there is no revenue establishment in any way comparable to that in existence in the provinces of Bombay and Madras. Again, for the reasons we gave in that report, we are of opinion that any attempt to improvise such a staff within a short time would end in failure.[1] The assessment, therefore, of the surpluses and deficits of individual producer-consumers in Bengal is not a practical proposition, and we see no prospect of the successful introduction of full monopoly schemes in that province. The position is the same in the permanently settled province of Bihar and in the permanently settled areas of the provinces of Assam and Orissa. In these parts of India, therefore, schemes of full monopoly purchase are not practical propositions.

As we have said, full monopoly places a heavy burden on the administrative machine. We take the view that in other provinces—that is, in those in which village records are maintained and a subordinate revenue establishment is in existence—the introduction of schemes of full monopoly will depend upon the degree of the need for the control of internal distribution in a particular

[1] Report on Bengal, Part III, Chapter I, paragraph 25.

area, which in its turn, will depend upon the extent to which the area is deficit and the difficulty which the Administration has in obtaining supplies from outside the area. The position in the Madras Presidency illustrates this point. A scheme of full monopoly has been introduced in those districts which are seriously deficit, and in which, in consequence, the need for the strict control of internal distribution is great. For instance, the district of Malabar is a heavily deficit area, having been largely dependent before the war on imports of rice from Burma. Great difficulty was experienced in obtaining supplies of rice for this district, and it was the consequent need for the strictest control of internal distribution which led the Government of Madras to introduce a scheme of full monopoly. On the other hand, in the surplus rice areas of the two deltas—areas which have an assured surplus—it has not been found necessary to introduce full monopoly. In these areas internal distribution presents no difficulty and may be safely left to the ordinary trade machinery. The problem in these surplus rice areas is mainly to ensure that the marketable surplus, in so far as it is not required to meet local needs, passes into the hands of Government. This has been accomplished by Government acquiring a monopoly of purchase of rice for export outside the areas combined with requisitioning from the producer, when there is indication that the cultivator is holding back his surplus crop.

Our views as regards full monopoly may be summed up as follows: In Bengal, Bihar and the permanently settled areas of Orissa and Assam, schemes of full monopoly are not a practical proposition. In areas which have an assured surplus and in which, in consequence, internal distribution can be safely left to the ordinary trade machinery, schemes of full monopoly are not necessary, provided the procurement machinery is adequate to ensure that the whole of the marketable surplus, apart from that required for internal consumption, passes into the hands of Government. In deficit areas in which internal distribution presents, or in the future may present, serious difficulties, the Administration should aim at the introduction of schemes of full monopoly on the lines of those in operation in Madras or Bombay.

15. In Orissa and the Central Provinces and Berar, schemes are in operation which, while they do not require the producer to sell the whole or part of his surplus grain to Government, create in favour of Government a limited monopoly of purchase over the marketable surplus, that is, over that part of the crop which the producer brings for sale to the market. These schemes have worked successfully, and in our report on Bengal we have recommended that the Bengal Government should study them with a view to their introduction, modified if necessary to suit local conditions, as an experimental measure in a selected district or districts.[1] As we have pointed out, a scheme of full monopoly is not a practical proposition in the province of Bihar. This province, which is normally a deficit province, has been fortunate in having had good crops

[1] Report on Bengal, Part III, Chapter I, paragraph 31.

and so far its procurement machinery has proved adequate in providing supplies for the urban and industrial population and the deficit rural areas. The situation may, however, quickly deteriorate if there should be a poor monsoon, and we consider that it would be advisable that the Bihar Government should study the schemes in operation in Orissa and the Central Provinces and Berar with a view to strengthening their procurement machinery in certain selected districts. The difficulties experienced in regard to the procurement of wheat in the United Provinces during the early months of this year (1945) strengthens us in making this recommendation.

Although the United Provinces have normally a surplus of wheat a serious situation developed towards the end of 1944 and in the early part of 1945 in regard to wheat supplies for the urban areas, and by February 1945 Government purchases had almost ceased. This deterioration in the procurement of wheat was due mainly, though not entirely, to the damage to the wheat crop caused by the unusual rains and hail in March and April 1944. The position has been met by the Government of India coming to the assistance of the Government of the United Provinces by supplying considerable amounts of wheat from the small stocks which the Central Government had been able to accumulate. The Provincial Government have now decided, in view of the difficulties experienced early this year, to introduce monopoly purchase of wheat to the extent that all wheat voluntarily brought for sale to the main markets, will only be permitted to be sold to Government or their agents. In fact they have decided to introduce a monopoly purchase scheme on the lines of that in operation in the Central Provinces.

Procurement in the Punjab

16. There are certain points in connection with procurement in the Punjab, the most important surplus area in India, to which we should refer. It is agreed that more storage accommodation is required so that procurement in the early part of the season, when grain normally comes freely into the market, is not held up owing to the difficulty of despatching it as quickly as purchases are made. This question of storage has been under discussion between the Government of India and the Punjab Government for some time, and it has now been decided to provide storage for 100,000 tons, 30,000 tons in "Lahore sheds" at railway stations, and 70,000 tons of bulk storage at places selected by the Punjab Government. The capital cost of the Lahore sheds is being shared by the Government of India and the Government of the Punjab. The cost of the bulk storage is being borne entirely by the Punjab Government. We understand, however, that it will be a considerable time before either of these schemes is completed. We attach great importance to the provision of additional storage in the Punjab and we suggest that every effort should be made to complete the construction of this storage at the earliest possible date.

Under the present system of centralized buying, procurement presents no difficulty so long as the forces influencing the market have on the whole a "bearish" effect. The Punjab has an assured and large surplus of grain and so long as prices are steady or display a downward tendency the exportable surplus comes freely into the hands of the only purchaser for export, that is, the Provincial Government. Procurement becomes difficult, however, if the forces influencing the market have a "bullish" tendency. In these circumstances there is the risk that the large producer will withhold his grain from the market in the hope of getting a better price, and that the trader will increase his stocks with the same object in view. Such a position can be met, of course, by Government holding off the market but such action is only possible if there are adequate reserves in the hands of the Central and the Provincial Governments. At present these reserves are not adequate and even if they were, it is desirable that action by the large producer and the trader, with the object of pushing up prices, should be countered as far as possible by direct as well as by indirect action. The direct action which Government can take is to use their powers of requisitioning, that is, to requisition from the trader who is holding stocks from the market with the object of raising the price level, and from the large producer who is holding back his surplus grain with the same object. We realize that the Punjab Government are opposed to requisitioning, particularly from the producer, but we are of the opinion that if it is established that the producer is holding back his grain from the market, or that the trader is refraining from placing his stocks on the market, with the object of pushing up prices, requisitioning should be resorted to without hesitation.

Storage

17. Storage is one of the most difficult problems with which food administrations in India are faced. Even in normal times a considerable quantity of foodgrains was lost every year through deterioration and the ravages of insects and rodent pests, while being stored preparatory to sale. There is, however, little doubt that at the present time, when large quantities are handled by official agencies, largely unfamiliar with the merchandising of grain, losses are on a much higher scale. It is, therefore, essential that storage accommodation should be improved and made insect and rat proof. A Storage Directorate, consisting of a technically qualified staff, has been established in the Food Department of the Government of India, and one of its duties is to advise administrations on technical matters concerning storage. A staff of entomologists also forms part of the Storage Directorate, and is now engaged on conducting enquiries into the best possible ways of protecting grain during storage against attacks by insects and other pests. The storage of grain under proper hygienic conditions is so important that we consider it desirable that all administrations, which store grain on any considerable scale, should, if possible, place their Storage Branch in charge of a fully qualified technical officer, assisted by the necessary technical

staff. We have said " if possible " because we realize that qualified technical officers are difficult to recruit.

Adequate storage is also essential to successful procurement, for lack of accommodation, when grain is coming on the market shortly after the harvest, often slows up procurement operations. In order to increase storage accommodation in the surplus areas, the Food Department of the Government of India have recently embarked upon a scheme for the construction of storage for 230,000 tons of grain in these areas. This accommodation includes 17,000 tons in Orissa, 25,000 tons in the Central Provinces, 100,000 tons in the Punjab (already referred to in the preceding paragraph), 55,000 tons in Sind and 23,000 tons for the produce of the Eastern States. The cost of construction, other than that for the produce of the Eastern States, will be shared equally by the Central and Provincial Governments, except in Sind where the cost of bulk storage for 30,000 tons will be borne wholly by the Centre and in the Punjab where the cost of the bulk storage will be borne by the Provincial Government. The accommodation for the produce of the Eastern States will be situated partly in British India and partly in the States; the cost of the former will be borne by the Government of India while that of the latter will be shared between the Government of India and the States.

For imported grain the Government of India have at present storage capacity for about 200,000 tons at the Karachi Depot, and we have been informed that this can be increased by another 50,000 tons, if necessary. In addition it is proposed to provide accommodation for 50,000 tons at Bombay, 40,000 tons at Calcutta, 10,000 tons at Vizagapatam, and 20,000 tons at Coimbatore (served by the Port of Cochin).

A certain amount of progress has been made towards the construction of this additional accommodation, but progress has not been as satisfactory as one could have desired. It is essential that the construction of this additional storage accommodation should be pushed forward as quickly as possible and we trust that progress in the future will be considerably accelerated.

Inspection.

18. The poor quality of grain distributed by the different administrations has often given rise to justifiable complaints and although the position has improved during the last year or so, the grain distributed is still not infrequently of poor quality. The maintenance of quality is a matter to which administrations must continue to give the closest attention, for there is nothing which gives rise to greater discontent in the rationed areas than grain of poor quality. The Government of India have recently decided to set up an Inspection Directorate for the purpose of advising administrations on inspection technique and procedure. It is also proposed to establish a Central Analytical Laboratory at New Delhi for the examination of the samples of grain held in the Central Storage Depots and distributed under the Basic Plan

and the rationing schemes. Inspection Departments have also been established in some provinces but the problem of quality will not be completely solved until there has been established in each province, whether surplus or deficit, a reliable agency competent to test and inspect all foodgrains brought into the Government stock and to carry out periodical inspection of stocks so that deterioration will be detected or forestalled. As in the case of storage, Inspection Departments should have on their staff persons fully qualified by experience and training to undertake the work of inspection.

RATIONING

19. The Foodgrains Policy Committee, in Chapter VII of their report, recommended that " rationing should be introduced forthwith in the larger cities of India both in deficit and surplus areas, both in provincial and state areas, in the first instance in those with a population of a lakh and over, and should be progressively extended ". The question of rationing was discussed at the Fifth All-India Food Conference held in New Delhi in January 1945 and a resolution endorsing the recommendation of the Foodgrains Policy Committee was passed. The relevant part of the resolution runs as follows:—" The present burden of over-all deficiency of foodgrains should be shared evenly by all parts of the country. With that object in view all Governments accept the following principles:—(i) Full urban rationing should be introduced and extended in accordance with recommendation 46 of the Foodgrains Policy Committee . . ." An urban population amounting to many millions is now rationed. In India, that is, British India and the Indian States, 67 towns with a population of 100,000 or over are rationed. In Bombay 101 other towns have been rationed of which 99 are under the Bombay Small Towns Rationing Scheme. In Madras a total of 84 towns has been rationed.

We attach importance to the rationing of the urban population in surplus as well as in deficit areas. When we speak of rationing we mean over-all rationing and not the type of rationing which is described as partial rationing or provisioning. Schemes of partial rationing or provisioning do not amount to true rationing, for under such schemes every person, in addition to the ration he draws from the Government supplies, is free to obtain further supplies of foodgrains from the ordinary retail shops.

The Government of the United Provinces were not until recently in favour of over-all rationing. They preferred a scheme for the provisioning of foodgrains for the urban population on a subsidized basis for (i) all essential and industrial employees, (ii) Government servants drawing a pay up to Rs. 100 a month, and (iii) the poorest 60 per cent of the urban population. The foodgrains for these classes were supplied through retail shops under the control of Government on a card ration basis. Persons in

possession of these cards were not, however, prohibited, if they so desired, from buying foodgrains from the free market. We have no doubt that the Provincial Government's scheme has in some ways worked satisfactorily. On the other hand, we feel convinced that the difficulties experienced by the Government in buying wheat towards the end of 1944 and in the early part of 1945 were aggravated by the fact, that an important section of the urban population was buying wheat in competition with Government. If this competitive buying had not taken place Government would have been able to purchase more grain at lower prices. The Government of the United Provinces have now decided to introduce total rationing for wheat and rice in place of provisioning. Overall rationing has been introduced into 13 towns and it is proposed to extend it to other towns in the near future.

In the Punjab only four towns have been rationed, namely, Lahore, Amritsar, Rawalpindi and Simla. In addition to these towns there are four other towns with a population of over 100,000, namely Multan, Sialkot. Ludhiana and Jullundur. The Punjab Government are of the opinion that the rationing of the urban population in an area such as the Punjab, which has an assured surplus, is unnecessary and is of no assistance towards the equitable distribution and the conservation of supplies. We cannot endorse that view. If the Punjab were an isolated unit we would be prepared to agree that the rationing of the urban population is unnecessary. The Punjab, however, is not an isolated unit but a part of India with obligations to the rest of India, and hence the rationing of the urban population cannot be regarded purely from the point of view of the Punjab. The objective of any procurement organization must be the elimination of competitive buying to the greatest possible extent, but so long as the demand of the urban population is met by the ordinary trade agencies one form of competitive buying prevails. The Bengal famine proved most clearly that the buying capacity of the urban areas has a great effect on prices, and the experience in the United Provinces in the early part of this year has emphasized the need for preventing competitive buying by the population of the urban areas. In the Punjab, it is desirable from the point of view of procurement that competitive buying should be reduced as far as possible, and one way of effecting this is by rationing the population of urban areas. It is on this ground that we consider that the rationing of the important urban centres of the Punjab or of any other surplus area is justified. It is true that rationing places an additional responsibility on the Administration for the maintenance of supplies and may involve some additional expenditure from public revenues. It is also true that as a result of rationing, prices in the rationed areas, particularly if prices are falling, may at times be out of parity with those in the adjoining rural areas, and that rationing may put some sections of the urban population to a certain amount of inconvenience. But these factors do not, in our opinion, outweigh the advantage accruing from a reduction in competitive buying. We referred above to the rationing of " important urban centres." We used these

words intentionally, for we recognize that in areas which have an *assured surplus* the case for the rationing of small urban centres is not so strong as in other areas. It is largely a matter of degree. We accordingly recommend that rationing should be extended in the Punjab, certainly so as to include the four towns which have a population of over 100,000 and have not yet been rationed.

REQUISITIONING

20. In our report on Bengal we said that we attached great importance to requisitioning, and went on to explain that we considered it essential that Government should be prepared to undertake requisitioning, as and when necessary, whether from traders or producers, if the flow of supplies is not maintained by voluntary sales.[1] We also explained that what we contemplated was not the requisitioning of the surplus of the small but the large cultivator. We are of the opinion that our observations on requisitioning in regard to Bengal are applicable to the whole of India with the exception, of course, of those areas in which full monopoly schemes are in operation. We realize that certain Governments are opposed to requisitioning from the cultivator and fear that the result of such action will be harmful and not helpful to procurement. We have, however, made it clear in our report on Bengal that we do not contemplate, except as an extreme measure in a grave emergency, general requisitioning and that what we have in mind is the requisitioning of the surplus of the large cultivator who is guilty of holding back his grain from the market. In certain provinces discriminate requisitioning of this character has proved very successful in maintaining the flow of grain and we see no reason why similar measures should not be equally successful in other provinces.

PURCHASING AGENCY

21. We have, in our earlier report, explained our reasons for preferring an official to a trade purchasing agency.[2] We have been confirmed in that view by the change made by the Assam Government in the procurement arrangements in the Surma Valley of the province and by the difficulties experienced by the Sind Government in regard to one of the buying syndicates in that province. As regards the general principle, we have nothing to add to the reasons we gave in our report on Bengal for preferring an official to a trade agency.

PRICES

22. The attempt in 1942 by the Government of India to control the price of wheat in the Punjab and the United Provinces by fixing statutory maximum prices failed. In January 1943 it was abandoned, and until the beginning of 1944 no attempt was made to secure statutory price control of foodgrains on a uniform basis. The failure in 1942 was mainly due to the absence of an adequate

[1] Report on Bengal, Part III, Chapter I, section E.

[2] Report on Bengal, Part III, Chapter I, section H.

procurement machinery. The question of statutory maximum prices was examined by the Foodgrains Policy Committee, and in its report in September 1943 the majority of the members strongly recommended that statutory price control should be instituted for all the major foodgrains in all provinces and states. The Committee laid great emphasis on the point that one of the essential conditions for effective statutory price control is the existence of an adequate procurement machinery. The Committee also recommended that statutory prices should not be fixed without the consent of the Central Government, and that a Standing Prices Committee, representative of the provinces, states, producers and the trade should be set up to advise the Government of India on prices. These recommendations were endorsed by the Fourth All-India Food Conference held in Delhi in October 1943 and were accepted by the Government of India.

The first step taken towards the co-ordination of maximum prices on an all-India basis was the summoning, in the first week of January 1944, of a conference attended by the Administrations principally concerned, to consider maximum prices for the *kharif* grains, rice, jowar and bajra. As a result of this conference, the maximum prices of jowar and bajra in the primary wholesale markets of all the surplus millet areas were fixed at Rs. 7 and Rs. 7–8–0 per maund respectively. These maxima are still in force. A maximum price for rice on an all-India basis was not fixed because the variations in price between the main producing areas were too great and the prices in parts (particularly Bengal) of the Eastern Region too high.[1]

In accordance with the recommendation of the Foodgrains Policy Committee, a Price Advisory Committee, presided over by the Economic Adviser to the Government of India, was set up early in 1944. On the recommendation of this Committee statutory maximum prices for wheat for the year 1944–45 were fixed at Rs. 9–8–0 per maund at the primary assembling markets in the Punjab and Sind, and at Rs. 10–4–0 per maund in those of the United Provinces. These maxima are still in operation.

23. Statutory minimum prices have not been fixed but in the case of certain foodgrains the Government of India have announced that, with the object of safeguarding the interests of producers, they will be prepared to buy all grain offered in the principal assembling markets should prices fall. In April 1944 it was announced that the Government of India would be willing to accept all wheat of fair average quality offered for sale in the main assembling markets of the Punjab, the United Provinces and Sind at a price of Rs. 7–8–0 per maund. This guarantee is still in operation. About a month later, in May 1944, in order to support the campaign for the diversion to foodgrains of land under short staple cotton, the Government of India announced that, should prices fall, they were prepared to purchase all jowar and

[1] The Eastern Region comprises Assam, Bengal, Bihar, Orissa and the Eastern States.

bajra of the 1944–45 crop offered in the main producing areas, other than Bombay, at "floor" prices of Rs. 5–8–0 and Rs. 6 per maund respectively. Bombay was excluded because it was felt that special prices would have to be fixed in view of the administrative measures which were being taken to compel the cultivation of foodgrains. It was later announced that the price of the 1944–45 millet crop in Bombay would not be less than the statutory prices.

24. As we have pointed out there has been, since 1943, a steady development on the part of some provinces and states towards the "monopoly" procurement of foodgrains. Where schemes of monopoly procurement are in operation, the fixed price at which Governments buy is the all-important factor and statutory maximum and floor prices become irrelevant.

Prices of foodgrains have not yet been fully co-ordinated throughout India, but during the last 18 months an increasing measure of control has been established. Prices have been stabilized and maintained at a steady level over large areas. This has been accomplished by a whole series of measures, an increase in the efficiency of the procurement machinery, the introduction in some areas of schemes of monopoly purchase, control over distribution through the rationing of urban and, in some provinces and states, rural areas, the planned distribution of imports, the planned movement of grain from surplus to deficit areas under the Basic Plan, and the introduction of statutory maximum prices. Success has not, however, been uniform. Prices of rice are still high in most parts of North and North-Eastern India. The price of wheat in the Punjab has at times fluctuated between the statutory maximum and the lower price level at which Government are under an obligation to buy all grain offered. Finally, in the United Provinces the enforcement of the statutory maximum price for wheat proved difficult at the close of the 1944–45 wheat season.

The general level of prices of foodgrains in India is high compared with the world level; for instance, the price of wheat in North America is considerably lower than that prevailing in India. We are of opinion that Indian prices must fall when consumer goods become more plentiful and cheaper and imports of rice are once again available. But we are also of opinion that so long as the supply position of cereals remains as at present, that is, so long as the demands of the defence services continue at the present high level and imports of rice are not available in adequate quantities, prices, generally speaking, will have to remain at about their present levels. High prices have undoubtedly encouraged the production of cereals and if prices should fall substantially before imports of rice become available, production might suffer a setback. The present policy is to hold prices at about their present levels till the supply position is easier. We consider that this is the correct course to follow.

Summary of Conclusions and Recommendations

25. The main conclusions and recommendations of this chapter may be summarized as follows:—

(i) The only completely satisfactory system of procurement and distribution of foodgrains is one in which first, the whole of the surplus of every producer is at the disposal of Government, and secondly, the entire population is rationed. Such a system is described as one of "full monopoly."

(ii) Full monopoly schemes are in operation in parts of Madras and some of the Indian States. The "levy" scheme in operation in parts of the Bombay Presidency is also, for all practical purposes, a scheme of full monopoly.

(iii) Schemes of full monopoly are not a practical proposition in Bengal, Bihar and the permanently settled areas of Orissa and Assam. In areas which have an assured surplus, schemes of full monopoly are not necessary, provided the procurement machinery is adequate. In deficit areas in which internal distribution presents, or in the future may present, serious difficulties, the Administration should aim at the introduction of schemes of full monopoly.

(iv) In Orissa and the Central Provinces and Berar, schemes are in operation which give Government a limited monopoly of purchase over the marketable surplus. In the Report on Bengal it was recommended that the Bengal Government should study these schemes with a view to their introduction, modified if necessary to suit local conditions, as an experimental measure in a selected district or districts. It is suggested that the Bihar Government should also study these schemes with the object of strengthening their procurement machinery.

(v) Storage is one of the most difficult problems with which food administrations in India are faced. Even in normal times a considerable quantity of foodgrains was lost through deterioration and the ravages of insects and rodent pests, and there is little doubt that, at present, when large quantities are handled by official agencies largely unfamiliar with the merchandizing of grain, losses are on a much higher scale. It is, therefore, essential that storage conditions should be improved and made insect and rat proof. It is recommended that all Administrations, which store grain on a considerable scale, should, as far as possible, place their storage branch in charge of a fully qualified technical officer assisted by the necessary technical staff.

Adequate storage is also essential to successful procurement. The Government of India have recently embarked upon a scheme for the construction of storage for 230,000 tons of grain in surplus areas. In addition, it is proposed to provide additional storage for 120,000 tons of imported grain. It is recommended that the construction of this additional accommodation, particularly that for 100,000 tons in the Punjab, should be pushed forward as quickly as possible.

(vi) The poor quality of grain distributed by the different Administrations has often given rise to justifiable complaints. Although the position has improved, the grain distributed is still not infrequently of poor quality. The Government of India have recently set up an Inspection Directorate at the Centre and Inspection Departments have also been established in some provinces. The problem of quality will, however, not be completely solved until there is in each province, whether surplus or deficit, a reliable agency competent to test and inspect all foodgrains brought into Government stock.

(vii) It is recommended that rationing should be extended in the Punjab to the four towns, with a population of over 100,000, which have not yet been rationed.

(viii) Attention is drawn to the observations as regards requisitioning in the Report on Bengal. It is recommended that Governments should not hesitate to requisition from the large producer and the trader if grain is being held back by them from the market in order to raise prices.

(ix) The general level of prices of foodgrains in India is high compared with the world level. Indian prices must fall when consumer goods become more plentiful and cheaper and imports of rice are once again available, but so long as the supply position of cereals remains as at present, prices generally speaking, will have to remain at about their present levels. If prices should fall substantially before imports of rice become available, production may suffer a setback. The present policy to hold prices at about their present levels till the supply position is easier, is, therefore, the correct course to follow.

CHAPTER IV.—STATISTICS OF ACREAGE AND YIELD OF CROPS

Problems arising out of the production and distribution of foodgrains during the war have emphasized the need for accurate agricultural statistics in India and schemes largely experimental in character, are now in operation with the object of securing improvements in such statistics.

2. The provinces fall, generally speaking, into two classes: those in which the land revenue has been temporarily settled and those in which it has been permanently settled. This distinction, however, is not a clear-cut one, for in the United Provinces, Madras and Assam there are areas which have been permanently settled and in the provinces of Bengal, Bihar and Orissa, the "permanently settled provinces," there are areas which have been temporarily settled. In the temporarily settled areas the primary agency for the collection of agricultural statistics is the village revenue officer, who, in the ordinary course of his work, is required to make a detailed inspection of the fields of the village or villages under his charge and record in the village records the crops grown on each field. Provided that supervision by the higher revenue staff is adequate, this system ensures estimates of acreage which it is believed are accurate. The position is the same in the permanently settled areas of the United Provinces, for in these areas the primary reporting agency is the same as in the rest of the province. In the permanently settled and *inam* areas of Madras, although the primary reporting agency is the same as in the rest of the province, the estimates of acreage are not so accurate. The difficulty in these areas is that there is not the same detailed revenue organization as in the rest of the province and parts of these areas have not been accurately surveyed. The Government of Madras have recently, with the object of improving the acreage statistics of the permanently settled and *inam* areas, appointed additional revenue inspectors.

3. In Bengal, Bihar and Orissa, the permanently settled provinces, there is no village revenue establishment corresponding to that in the temporarily settled provinces, and in these provinces, with the exception of the jute acreage in Bengal, estimates of acreage are admittedly very defective. The position is the same in the two permanently settled districts of Assam. In the absence of a village revenue establishment reliance has to be placed on the reports received from Circle Officers, District Agricultural Officers, and officers of the Revenue Department, such as Khasmahal Tahsildars, and even the police. For instance, the following is the method followed in the province of Bengal. Each Circle Officer (a gazetted revenue officer with jurisdiction over three or four *thanas*) ascertains from personal inspection and by questioning other local officers and cultivators, the relation which the area under the crop bears to the normal acreage of that crop in that area, this normal acreage being determined in accordance with certain instructions. The

Circle Officers send their estimates to the Subdivisional Officer who, after making such corrections as he considers necessary, either from his own knowledge, experience, and observations or by enquiry, sends a consolidated estimate for the subdivision to the District Officer. The latter, in his turn, makes such modifications as he thinks necessary on the basis of his own experience and information obtained from District Agricultural Officers and other sources, and forwards the district estimate to the Director of Agriculture. Clearly, acreage estimates prepared in this manner cannot be accurate.

4. In Bengal a complete survey was made of the area under jute in 1940–41 by a plot-to-plot inspection and since that date jute is only grown under licences issued by the Jute Regulation Department. The total area licensed for growing jute in each village is thus known. Further a verification of the lands on which jute is actually grown, is made before the crop is harvested. The statistics of the acreage under jute are now believed to be reasonably dependable.

5. In Bengal the following further measures have recently been adopted with a view to obtaining more satisfactory estimates of the acreage of the crops grown in the province. First, a plot-to-plot enumeration of all crops grown to be carried out by the Jute Regulation staff assisted by a large staff of *amins* and part-time crop-recorders, and secondly, random sample surveys of the acreage under jute, *aus* paddy and *aman* paddy. These schemes were put into operation with effect from the *aman* paddy crop reaped in November-December 1944 and are to be carried on for a period of three years. A decision will then be taken, in the light of the experience gained, on future policy, that is, whether the annual acreage estimates should be made by the plot-to-plot enumeration or by the random sampling method, or by a combination of both these methods.

6. In Bihar, estimates of acreage were made by the random sampling method throughout the province for the *bhadai* and *aghani* crops of 1944 and the *rabi* crops of 1944–45. We understand that the Provincial Government have decided that the more satisfactory method would be to adopt a system similar to that prevailing in the temporarily settled provinces. It is recognized that this will involve heavier expenditure, but it is considered that the establishment of a permanent staff in the villages throughout the province for the collection of agricultural statistics (on a system of plot-to-plot enumeration), as well as other statistics such as cattle statistics, justifies the additional expenditure involved. When this establishment has been recruited it is proposed to abandon the random sampling method.

7. In Orissa, a special temporary staff was appointed early in 1944 for the collection of agricultural statistics. This consists of *amins*, one for every 80 revenue villages, whose duty will be to inspect every field once at the time of sowing and again when the crop is ripe for harvest. The work of these *amins* will be supervised by inspectors at the rate of one inspector for every seven

amins. A statistical officer has also been appointed for each district for the purpose of controlling and directing the work of the inspectors and *amins*. In addition, a Provincial Statistical Officer has been appointed to supervise and co-ordinate the collection of agricultural statistics throughout the province.

8. A plot-to-plot enumeration should give accurate estimates of acreage and we believe that in the temporarily settled provinces the estimates prepared by this method are on the whole accurate. But it does not follow that the application of this method in the permanently settled provinces will produce immediately equally accurate results. In the temporarily settled provinces the work is done by a long established and well organized revenue staff as part of its duties. The village revenue officer is a person of standing and influence and is well trained in the work he is required to perform. Further, there is an efficient inspection staff, the members of which are also well versed in the duties of their office. In the permanently settled provinces there is no such organization and at the beginning the staff—certainly a large proportion of it—will be entirely unacquainted with the work to be done. There is another point to which attention should be drawn. It is this. The area of the primary unit,[1] that is, the area allotted to the officer who carries out the plot-to-plot enumeration, must not be too large. There is, however, a risk that it may be, for the cost of the establishment for carrying out a plot-to-plot enumeration is heavy and there may be a tendency to increase the area of the primary units in order to reduce the cost. The survey of a crop, field by field, is a tiresome task and one which is attended by a considerable amount of discomfort at certain seasons of the year, particularly in areas where the land goes under water. The danger, of course, is that the primary enumerator instead of visiting each field will, to a greater or lesser degree, compile his figures from information gathered by questioning the cultivators. The larger the area with which he has to deal, the greater is the risk that this will happen. There is also another matter which has to be taken account of in determining the size of the primary unit. It is necessary to make an estimate not only of the area sown with the crop but also of the area harvested. The period of time within which the plot-to-plot enumeration at harvest time has to be carried out is relatively short, and hence the area of the primary unit must not be so large as to prevent the enumerator from making a complete inspection, plot by plot, at harvest time. The size of the primary reporting unit is therefore a matter of great importance and until experience has been gained as to what the size should be—it may vary from area to area—the risk of inaccuracy will remain. In all these circumstances, it would be clearly unwise to rely upon the accuracy of estimates based on a plot-to-plot enumeration in permanently settled areas, until the staff has been in being for some years and experience gained of the working of the system. It should not, however, be inferred that we are opposed to the continuance of the

[1] In the temporarily settled provinces the primary unit is the village or a group of small villages.

plot-to-plot enumeration schemes in the permanently settled provinces. We are not. We are of opinion that they should be proceeded with, provided of course, that the primary reporting and inspecting staff is adequate for the purpose. We have, however, stressed that the estimates are unlikely to be accurate until the schemes have been in operation for some time and that the size of the primary units is a most important factor.

9. As regards the relative merits of a plot-to-plot enumeration and random sample survey for the determination of acreage there appears to be some divergence of views. It may be of assistance if we set out the matter as we see it. A plot-to-plot enumeration provides a wealth of information which a random sample survey cannot furnish. For instance, it gives figures for the smallest unit, a village or a part of a village. As against this, a random sample survey can only give acreage figures for large areas, such as a province, and we gather that it has not yet been established that a random sample survey can give accurate figures for a district or a subdivision except at disproportionate cost. The position is that the smaller the area for which acreage figures are to be given, the nearer the random sample survey approaches the plot-to-plot enumeration. Again, a complete enumeration plot by plot can give figures for all crops irrespective of the extent of the area on which they are grown, whereas this is not possible by means of a random sample survey except at disproportionate cost. To sum up, the position appears to be that if full and detailed information as regards the acreage under all crops is the objective—it certainly should be the objective—such information can only be obtained by means of a plot-to-plot enumeration and not by a random sample survey. In these circumstances, there cannot, in our opinion, be any question of the abandonment of the plot-to-plot enumeration method in favour of the random sample survey method in the temporarily settled provinces. In the other provinces also we consider that the plot-to-plot enumeration should be the goal, for it is only by this method that full and detailed information as regards the areas under different crops can be obtained. There are, however, certain points to which we would draw particular attention. The *sine qua non* for carrying out a plot-to-plot enumeration is an adequate and efficient staff of primary enumerators and inspectors. The cost of such a staff is heavy, and unless Administrations are prepared to find the necessary funds, it would be useless to attempt a plot-to-plot enumeration, for the only result would be inaccurate estimates. Again, a plot-to-plot enumeration must be carried out yearly and not at irregular intervals by *ad hoc* establishments. As we have explained in the previous paragraph, estimates prepared by a newly recruited establishment will not be accurate during the early years of the existence of that establishment. Any endeavour, therefore, to economize by carrying out a plot-to-plot enumeration at intervals of, say, 3 to 5 years would only result in the preparation of inaccurate figures. If a plot-to-plot enumeration is to be successful the staff must be on a

permanent basis, for it is only by employing the same staff every year, subject, of course, to recruitment to cover wastage, that accurate estimates will be secured.

10. Under the present system the yield per acre in a particular year is determined by multiplying the normal yield per acre by the condition factor of the crop in the year in question. The normal yield is based upon crop-cutting experiments made yearly over a number of years. These experiments are carried out in plots with average crops, the plots being selected by an " eye " examination. The condition factor (the anna valuation), that is, the relation of the crop reported on to the normal yield per acre, is framed on the results of visual observations made by local officers. The practice of selecting by the " eye " plots with average crops has been condemned by statisticians and the method of determining the condition factor has been severely criticized. There is, no doubt, room for considerable improvement in the method of estimating the yield per acre.

A considerable amount of experimental work has been carried out during the last seven or eight years by the Indian Statistical Institute under the direction of Professor Mahalanobis in estimating by the random sample method the outturn (and the acreage) of crops. As we have said, random sample surveys of the yield (and acreage) of the jute and paddy crops are now in progress in Bengal. They are being carried out by the Indian Statistical Institute on behalf of the Bengal Government and will be continued for a period of three years. Experimental random surveys of yield have also been carried out by the Imperial Council of Agricultural Research. In 1944 such surveys were made of the yield of wheat in the Punjab and the United Provinces and rice in Orissa. In this year (1945) these surveys have been extended to all the main wheat growing areas. The surveys in Bengal will continue till 1946–47 and it would clearly be advantageous if the surveys in other parts of India, conducted either by the Imperial Council of Agricultural Research or by the Indian Statistical Institute, were also continued for the same period. In the light of the experience thus gained it should then be possible, we would hope, for a decision to be reached as regards, first, the technique to be followed in carrying out random sample surveys, and secondly, the extent to which these surveys can be used in determining the yield per acre in a particular year. Until a decision has been reached on these points we doubt whether anything will be gained by examining other methods of improving the present system. The random sample method is a scientific method of computing yields and the first matter to be decided is whether the adoption of this method is a practical proposition and whether it can fulfil completely administrative requirements.

11. The Royal Commission on Agriculture considered that every Director of Agriculture should be given a capable statistical assistant. They referred to the increasing importance which is being attached all over the world to statistical research as an aid

to the formulation of policies, and recommended the appointment of a well qualified statistical officer at provincial headquarters to whom should be entrusted the duty of studying all aspects of the economic and social progress of the province. We draw particular attention to these recommendations because we attach great importance to the Director of Agriculture being provided with statistical assistance, and the establishment at provincial headquarters of statistical officers who would be directors of provincial bureaux of statistical information. In some provinces these officers have been appointed and we strongly recommend that they be appointed in the remaining provinces as quickly as possible.

12. In the "Agricultural Statistics of India" crops are divided into "food" and "non-food" crops. Food crops include (1) foodgrains, that is, rice, wheat, jowar, bajra, barley, maize, gram, other grains, and pulses; (2) sugarcane; (3) vegetables; (4) fruits; (5) condiments; (6) spices; and (7) miscellaneous food crops. Under "non-food" crops are included all edible oil seeds, such as sesamum, rape, mustard, groundnut, and cocoanut, and also non-edible oil seeds such as linseed and castor, and other miscellaneous oil seeds. Within this category are also included the fibre crops such as cotton and jute, as well as indigo, opium, coffee, tea, tobacco, drugs, dyes, fodder crops, and other miscellaneous non-food crops. In our attempt to obtain precise information regarding food crops we have been struck by the difficulties arising from the present classification. Different provinces have adopted different categories which has led to a certain amount of confusion. Although edible oil seeds are used for industrial purposes such as the manufacture of soap, plastics, etc., they are also used largely for human consumption. We incline to the view that for statistical purposes edible oil seeds should be classified under the head "food" crops.

Separate figures are not given for the production of potatoes, sweet potatoes, and tapioca. The two latter have been of importance in times of food shortage. The area under tapioca expanded largely during the years 1943–44. We believe that the areas under potatoes and sweet potatoes have also increased. We take the view that separate figures should be given in the "Agricultural Statistics of India" for these crops.

Summary of Conclusions and Recommendation

13. The conclusions and recommendations of this chapter are—

(i) Problems arising out of the production and distribution of foodgrains during the war, have emphasized the need for accurate statistics of acreage and yield of crops; schemes are now in operation with the object of securing improvements in these statistics.

(ii) For the determination of the acreage a plot-to-plot enumeration is preferred to a random sample survey, because the former can, whereas the latter cannot, give full and detailed information as regards the areas under different crops.

(iii) In the "temporarily settled provinces" the acreage figures are compiled by the subordinate revenue establishment by a plot-to-plot enumeration. In these provinces the acreage figures are on the whole accurate and it is recommended that the present system should continue.

(iv) In the "permanently settled provinces" acreage figures, except in regard to jute in Bengal, are not accurate; they are not compiled by a plot-to-plot enumeration but are based upon reports received from local officers. In the provinces of Bengal, Bihar and Orissa schemes have recently been introduced for the determination of acreage by the system of plot-to-plot enumeration. In addition, in Bengal, a scheme is in operation for the determination of the acreage under jute, *aus* paddy and *aman* paddy by the random sample survey method.

(v) It is considered that in the "permanently settled" provinces the goal should be the determination of acreage by the method of plot-to-plot enumeration. It is pointed out that in order to ensure the accuracy of the estimates prepared by this method it is essential that (*a*) the plot-to-plot enumeration should be carried out by an adequate and efficient staff of primary enumerators and inspectors maintained on a permanent basis, and (*b*) the size of the primary reporting unit should not be too large.

(vi) There is room for considerable improvement in the method of estimating yield per acre.

(vii) The random sample method is a scientific method of computing yields and the first matter to be decided is whether the adoption of this method is a practical proposition and whether it can fulfil completely administrative requirements. Random sample surveys of yield are now being carried out in Bengal by the Indian Statistical Institute and in other parts of India by the Imperial Council of Agricultural Research. The surveys in Bengal will be continued for a period of three years. It is suggested that the surveys by the Imperial Council of Agricultural Research should be continued for a similar period. A decision should then be reached in the light of experience gained as regards first, the technique to be followed in carrying out the random sample surveys, and secondly, the extent to which these surveys can be used in determining the yield per acre in a particular year. Until a decision has been reached on these points nothing will be gained by examining other methods of improving the present system.

(viii) Every Director of Agriculture should be provided with a capable statistical assistant.

(ix) A qualified statistical officer should be appointed at all provincial headquarters to whom should be entrusted the study of all aspects of economic and social progress in the province.

(x) For statistical purposes edible oil-seeds should be classified under the head "food crops." Separate figures showing the acreage under potatoes, sweet potatoes, and tapioca should be given in the "Agricultural Statistics of India."

CHAPTER V.—THE NEED FOR IMPORTS

As explained in Chapter I, India before the war was not self-sufficient in foodgrains, a small exportable surplus in wheat being offset by large imports of rice. During the five years ending 1941–42 the average annual net imports amounted to about 1,000,000 tons and it was on the basis of this figure that in 1943 the Foodgrains Policy Committee came to the conclusion that India required, until further notice, for current consumption, an annual import of foodgrains of not less than this amount.

2. The following tables give the acreage and production of the main cereals, wheat, jowar, bajra, barley, maize and rice, over a series of years. The figures for rice have been shown for Bengal and the rest of India separately because those for Bengal for the year 1943–44 are not comparable with the figures for previous years. This is due to the fact that, as explained in our report on Bengal, the acreage under *aman* rice in 1943–44 was not estimated in the same manner as in previous years.

Crop.	Average of three years ending 1938–39.	Average of three years ending 1941–42.	1942–43.	1943–44.
	Acreage (in millions of acres).			
Wheat	34·8	34·3	34·4	33·7
Jowar	34·8	33·7	35·9	36·0
Bajra	16·9	17·9	22·2	21·1
Barley	6·3	6·3	6·8	6·7
Maize	6·3	6·3	6·9	6·9
Rice (All-India excluding Bengal)	51·7	51·4	51·9	53·4
Rice (Bengal)	22·6	22·3	23·3	24·6
	Production (in millions of tons).			
Wheat	10·2	10·3	11·0	9·7
Jowar	6·8	6·7	6·7	6·7
Bajra	2·6	2·9	4·0	3·7
Barley	2·1	2·1	2·2	2·1
Maize	2·0	2·1	2·4	2·4
Rice (All-India excluding Bengal)	17·7	16·3	17·9	18·8
Rice (Bengal)	8·8	8·1	7·0	10·3
Total (excluding rice in Bengal)	41·4	40·4	44·2	43·4
		40·9		43·8
Average, say ..		41·0	Average, say ..	44·0

We offer the following observations on the above figures:—

(i) *Wheat.*—The acreage under wheat has remained steady. The decrease in 1943–44 was due to unfavourable weather at the sowing time. The wheat crop of 1942–43 was a bumper one; this was due to very favourable weather conditions. The crop in 1943–44 was below normal owing to unfavourable climatic conditions. Heavy rain and hail caused considerable damage towards the end of the growing season.

(ii) *Jowar.*—The acreage shows a considerable expansion but this has not been reflected in the yield.

(iii) *Bajra.*—The acreage and the yield have both increased. The average outturn during the two years 1942–43 and 1943–44 was about a million tons more than the average of the preceding six years.

(iv) *Barley and maize.*—While barley shows practically no change, both the acreage and yield of maize show an increase. The production of maize was about 350,000 tons more in 1942–43 and 1943–44 than the average of the previous six years.

(v) *Rice (Bengal).*—Owing to an excellent monsoon, the rice crop in Bengal in 1943–44 was probably the largest on record. Climatic conditions in 1944–45 were not so favourable and the rice crop of that year is estimated to be 1·44 million tons less than the bumper crop of the previous year. This well illustrates the effect of variations in climatic conditions.

(vi) *Rice (rest of India).*—There was an increase in the acreage as well as in the yield in 1943–44 as compared with 1942–43 and the previous six years. The increase in the yield was about 900,000 tons as compared with that in 1942–43. The increase in acreage and yield was largely due to a very favourable monsoon. In 1944 the monsoon was less favourable and the estimates so far available of the 1944–45 crop show a large fall in yield in some areas. The total yield of the rice crop in 1944–45 will certainly be considerably below the high figure of 1943–44.

3. The following figures are repeated from the tables in the previous paragraph. The total production of the main cereals. wheat, jowar, bajra, barley, maize and rice, in India, excluding rice in Bengal, were:—

Average for the six years ending 1941–42.	(In millions of tons). Average for the years 1942–43 and 1943–44.
41·0	44·0

We have omitted the figures for the yield of rice in Bengal because, as we have said, the estimates for 1943–44 are not comparable with those of the previous years. If they were included it would be impossible to compare the total yield of cereals in India in the two years 1942–43 and 1943–44 with those in previous years. We do not think that this omission will materially affect the comparison.

It may, at first sight, appear that in view of the increase in production of 3 million tons, the difference between the average total production of the years 1942–43 and 1943–44 and that of the six years ending 1941–42, India does not now require imports. Closer examination shows, however, that this conclusion is not well founded.

4. India's population of about 400 millions still continues to increase. During the inter-censal period of 1931 to 1941 the population increased on the average by about 5 millions a year. An annual increase of 5 millions in the number of persons to be fed, involves a yearly addition to India's food bill of over 600,000 tons of cereals on the basis of 1 lb. of grain per day per adult. During the three years that have elapsed since 1941–42 there has, therefore, been an increase in consumption, due to this cause, of nearly 2·0 million tons.

There is also little doubt that, apart from an expanding consumption due to the growth of population, the consumption of foodgrains by large classes of the civilian population has increased during the last two years. There is now practically no unemployment; everybody who wishes to work has no difficulty in obtaining employment. This is a great change from the pre-war position when the number of unemployed, particularly in certain sections of the community, was large. This high level of employment must have been accompanied by an increase in the consumption of foodgrains. Further, large numbers of producer-consumers and their families are now, in all probability, eating more than they did in normal times. The cultivator is obtaining high prices for his produce and has to sell a smaller proportion of his grain than he did before the war, in order to meet his standing payments, such as rent, taxes and debt charges. As against this, of course, the prices of the goods he buys have risen steeply. But on the whole, the financial position of the cultivator has improved considerably in consequence of the high prices for foodgrains and there can be little doubt that millions who were under-nourished in normal times, are now eating more. It is not possible to assess the increase in consumption due to these causes, but in view of the great numbers involved it must be large.

5. The supply of foodgrains for the defence services, including the overseas forces in and based on India, has also thrown an additional burden on the country's food supplies. The yearly requirements of these services amount to approximately 800,000 tons of wheat, rice, barley, maize and millets. It is true that the amount consumed by the Indian soldier does not represent a net increase in the off-take of foodgrains for, he would eat foodgrains if he remained in his village. But the Indian soldier, generally speaking, is better fed than he would be if he were in civil life—the ration for Indian troops is $1\frac{1}{2}$ lb. of foodgrains per day—and hence the feeding of the Indian defence forces adds to the total cereal requirements of the country. The supplying of the overseas forces also involves extra demand.

6. There is another matter to which attention should be drawn. The yields of crops in India are subject to great and often sudden fluctuations owing to climatic conditions. In the irrigated areas, crops are protected against a failure of the monsoon but they are not immune from damage by excessive rain, diseases and pests and,

in some areas, by hot winds, hail and frost. It is, therefore, unsafe to draw conclusions as regards the relation of supply to requirements based upon the yield of the crops in a short period of two years. The yields in 1942-43 and 1943-44 and the estimated outturn for 1944-45 illustrate this point. There was a bumper crop of wheat in 1942–43 and a normal crop of rice. On the other hand 1943–44 was marked by a bumper rice crop and a sub-normal crop of wheat. It is yet too early to form an opinion as regards the supply position in 1944–45. But it is clear that in view of the smaller yield of rice in 1944–45 compared with that in 1943–44 the supply position in 1944–45 will be less favourable than it was in 1942–43 or 1943–44 unless the wheat crop proves to be a bumper one.

7. Having regard to the increase in consumption due to the growth of population, the increase in the *per capita* consumption of large classes of the civilian population—an increase which is in every way desirable in view of the low level of subsistence of the poorer classes in the villages and towns—and the burden of the requirements of the defence services, we doubt whether there was any substantial improvement in the overall position during the years 1942–43 and 1943–44 as compared with previous years. We are of opinion that the present relation of internal supply to requirements is not such as to warrant the conclusion that imports are unnecessary.

8. Experience during the last two years also points to the conclusion that India still needs imports of foodgrains. During this period Food Administration in India developed greatly. Procurement organizations are in operation in the provinces and in the Indian States. The prices of cereals are under control. A large proportion of the urban population, and in some areas, the rural population, is rationed. The Basic Plan has been in operation for two years. It will be recalled that this plan is in the form of a balance-sheet, on one side of which appear the surpluses from surplus areas, and on the other the supplies required by the deficit areas. It is prepared by the Government of India in consultation with the provinces and states and after careful scrutiny of the estimated surpluses and deficits. Much more information is, therefore, now available as regards the actual supply position in India than in 1943 when the Foodgrains Policy Committee reported, and it is possible to make, with more precision, an estimate of the gap between the essential requirements of foodgrains of India as a whole and the quantities available from internal resources. In 1944 imports of foodgrains, chiefly wheat, amounted to over 700,000 tons and the Government of India found it necessary to distribute practically the whole of this amount to the deficit areas. This in itself affords ground for the conclusion that India is still in need of imports.

9. Apart from their intrinsic value imports have a great psychological effect. In 1943 public confidence was greatly shaken by the events in Bengal and by the difficulties experienced in other

areas in maintaining supplies. In 1944 confidence was largely restored. This, no doubt, was due in large measure to the improvements effected in food administration, but we are convinced that the arrival throughout the year of foodgrains from overseas played a most important part in restoring public confidence. Indian opinion is, however, still extremely nervous on the subject of food supplies, and any indication of an unfavourable turn in the supply position leads to the slowing up of procurement operations, and is likely in some parts of the country to give rise to a sharp changes in the price level. It is essential that public confidence should be maintained. In this matter imports play a most important role and we have little hesitation in affirming that the stoppage of imports would place the food position in India in serious jeopardy.

10. Imports must consist mainly of wheat because rice is not available under conditions created by the war, from countries overseas. The question therefore arises how the quantity of wheat imports is to be determined. We understand that the Government of India adopt the following method in estimating the amount of wheat which they consider needs to be imported. Towards the end of the calendar year an estimate is made of the wheat required for the 12 months commencing from the 1st May of the following year, that is, for the Indian wheat year which runs from 1st May of one year to the 30th April of the next. This estimate is based upon the requirements of those provinces and states which do not grow within their own boundaries sufficient wheat for their own consumption, and includes the amount required not only for the population which normally consumes wheat, but also for those sections of the population which normally consume rice and have been compelled, by the short supply of that cereal, to change over to a diet consisting partly of wheat. The demands of the several provinces and states are subjected to a critical examination by the Government of India, with particular reference to the amounts supplied in previous years under the operation of the Basic Plan. To the figure thus obtained is added the wheat demand for the defence services. An estimate is then made of the surpluses available from the surplus wheat provinces and states based in the first instance on the assumption that the wheat crop in those areas will be a normal one. This assumption is made at this stage because the wheat crop is not harvested until some months later and the probable yield is therefore unknown. Experience has shown that with a normal crop the amount available from the surplus wheat areas is approximately 800,000 tons a year. The first estimate of the imports therefore consists of the difference between the amount required for internal consumption in the deficit areas plus the demand for the defence services, and 800,000 tons. This is subject to revision when the yield of the wheat crop which is harvested in April and May, is known. The surplus available from the surplus provinces and states is then adjusted in accordance with the estimated yield of the crop. If the yield of the crop is more than normal, the estimate of imports is reduced accordingly and

vice versa. The estimate is also revised periodically during the course of the year, having regard to any changes in the supplies available from the surplus areas or the requirements of the deficit areas arising out of circumstances which were not foreseen when the estimate was last revised. The Government of India, we understand, consider this to be the best way in which an estimate of imports can be prepared. We endorse that view, particularly as it enables the volume of imports to be regulated in accordance with changes in the supply position in India. We regard this method of calculating the volume of imports of wheat as more satisfactory than one based on the imports of rice during the pre-war period.

11. The Foodgrains Policy Committee recommended the creation of a central foodgrains reserve of not less than 500,000 tons. They considered this reserve to be absolutely necessary to prevent a breakdown in the machinery of procurement, rationing, and price policy and added that it would not be a substitute for, but a complement to, more vigorous administrative action in other fields. It may be urged that a central reserve is not now necessary because, first, in spite of the absence of such a reserve, Administrations in India have been successful in maintaining their procurement, rationing and price policies, secondly, that public confidence which was so severely shaken by the events of 1943, has been restored, thirdly, Provincial and State Governments possess wheat reserves varying from one and a half to three months' requirements of their rationed areas, and fourthly, the Bengal Government have a large reserve of rice and paddy amounting to over 500,000 tons. In spite of this improvement in the situation we take the view that a central reserve is still essential. It is true that the measures taken by the Food Administrations at the Centre and in the Provinces and States have been the important factor in keeping the situation under control, but the success is also due partly to the imports of wheat—700,000 tons were imported in 1944—and partly to the fact that India has been fortunate in having had an exceptionally good wheat crop which came into consumption in 1943–44, followed by an equally good rice crop in 1943–44. If these bumper wheat and rice crops had not occurred in alternate years the position would not have been so good. It was the excellent rice crop in Bengal which enabled the Government of the province to build up their present reserve. But this reserve may be heavily drawn upon, should there be a short crop in that province. Further, it should be remembered that the Bengal Government are now primarily responsible for supplying rice to Greater Calcutta. That demand is in the region of 275,000 tons a year.

The wheat situation in the United Provinces, the North-West Frontier Province, and in Delhi deteriorated rapidly during the early months of 1945, that is, towards the close of the wheat season preceding the reaping of the 1945 crop. This was due to a falling off in procurement in both the Punjab and the United Provinces

and this in its turn was due, in all probability, to the smaller outturn of the crop reaped in April—May 1944. The crop in the United Provinces was badly damaged by hail and heavy rain at harvest time in 1944. The situation has been met by the prompt use of the small reserve which the Centre had been able to accumulate. If this reserve had not been available a disastrous situation might have developed in the United Provinces and dangerous shortages might have occurred in the North-West Frontier Province and in Delhi. It appears clear to us, therefore, that the Central Government should have in their hands, at all times, stocks sufficient to ensure that they are in a position to meet an emergency, such as that which occurred this year, owing to the failure of procurement at the end of the crop season. Such emergencies cannot always be foreseen and the normal reserves kept by the provinces and states against the requirements of the rationed areas are not and cannot be adequate to deal with them. If, however, the Central Government have reserves, supplies can be sent quickly to the affected area and the situation prevented from getting out of hand. We would also advance another reason. Since the war began, there has been no serious failure of the monsoon. But the danger of a poor monsoon before normal conditions return exists. India is a predominantly agricultural country and opinion reacts quickly to any sign of a failure of the rains. It is just at this stage that the knowledge that the Centre has a reserve would prove of great value in preventing panic and maintaining public morale. The same effect cannot be obtained from a programme of imports spread over a period of 12 months, for the rate of imports cannot be speeded up at short notice and in the meantime the situation may have got out of control.

As regards the size of the reserve, this question is not easy to answer. It obviously cannot be so large as to be adequate to deal with the situation that might arise from a serious failure of the monsoon. Such a position would have to be met by drastic control measures and imports. It should, however, be sufficiently large to enable the Central Government first, to deal with local or temporary shortages, which, if handled with speed and decision, can be prevented from spreading and causing serious lack of public confidence, and secondly, to sustain public confidence if the monsoon should give rise to anxiety. In present circumstances such a reserve can only be built up from imports of wheat and we do not think that a reserve of 500,000 tons would be excessive, amounting as it does to only a little more than 3 months' wheat requirements of the deficit provinces and states and the defence services.

12. In conclusion we recommend that India's need for a regular supply of imported wheat to cover the current deficit of wheat under the Basic Plan and to build up a central reserve of 500,000 tons should be recognised by His Majesty's Government. We further recommend that a public announcement may be made indicating broadly the nature of the arrangements made in regard

to the provision of imports. We may add that we fully recognize that the imports of wheat which the United Nations will be able to provide for India depend on various factors in regard to which we have no knowledge, that is, the needs of other countries and the shipping available. In making our recommendations we have not lost sight of these important factors. But we trust that it will be possible to meet the current needs of India for wheat, calculated on the basis of the formula adopted by the Government of India, and in order to build up a central reserve.

Summary of Conclusions and Recommendations.

13. Our conclusions are—

(i) India, before the war, was not self-sufficient in foodgrains, a small exportable surplus of wheat being offset by large imports of rice.

(ii) Although, the production of foodgrains has increased, consumption has also increased, owing to the growth of population, a higher *per capita* consumption by the poorer classes of the population and the requirements of the defence services. India is still in need of imports.

(iii) Imports must consist mainly of wheat because rice is not available under conditions created by the war.

(iv) The method now followed by the Government of India in estimating wheat requirements is considered suitable; it enables the volume of imports to be regulated in accordance with changes in the supply position in India.

(v) In agreement with the Foodgrains Policy Committee it is considered that a central reserve of 500,000 tons of foodgrains is essential. In present circumstances such a reserve can only be built up from imports of wheat.

CHAPTER VI.—FOOD ADMINISTRATION DURING THE IMMEDIATE POST-WAR PERIOD

We have described in an earlier chapter the main features of the present system of food administration in India and pointed out how it is generally adapted to the varying circumstances and needs of different parts of the country. We have also drawn attention to the directions in which a tightening of controls is necessary and improvements may be carried out. We have not, however, dealt with the following questions. How long are these controls to continue; when and how are the controls to be relaxed; and how is the return to peace-time conditions to be organized? We propose to examine these questions in the present chapter.

2. This is necessary primarily because the process of relaxation of existing controls is bound to present difficult problems which must be studied in advance and prepared for. The varying measures of control adopted by the Provincial and State Governments in their respective areas, and by the Central Government in India as a whole, constitute a complex and interdependent system which cannot be withdrawn in a day. The return to normal conditions must be a gradual, regulated and co-ordinated process. Unless it is planned and prepared for in advance, and adapted to the changing conditions of the immediate post-war period, the chaotic price and supply conditions which prevailed in many parts of the country, in the summer of 1942 and during the greater part of 1943, may be repeated. The outstanding lesson of the events of 1942 and 1943 is the need for anticipating the probable effect of changing conditions and establishing a common plan of action agreed upon between the Centre and the Provinces and States.

3. There is also another reason why the process of transition from war to peace conditions should be planned in advance. Obviously, the nature of the steps to be taken during the transition will depend to some extent on the nature of the system which it is proposed to maintain in peace-time for the supply and distribution of food. Is the country to revert entirely to pre-war conditions in this respect or, are any material changes visualized? We deal with this question in a later chapter. In our view, a policy of *laissez faire* in the matter of food supply and distribution is impossible in the future; and we recommend elsewhere the acceptance in principle by all the Governments concerned of their responsibility for increasing the food resources and improving the diet of the people, as a permanent objective of a common food policy for India. Among the measures necessary for the discharge of this responsibility, a prominent place must be assigned to the control of the price of cereals so as to ensure a reasonable return to the cultivator. In practice, we believe this will involve State action designed to regulate the prices of rice and wheat, the

cereals which enter largely into international trade. Such regulation is likely to require co-ordinated action both by the Central Government and the Governments of the Provinces and States along the following lines: First, the fixation of minimum prices which would be fair to the producer, and maximum prices which would be fair to the consumer, and the revision of such prices from time to time; secondly, decisions as to the measures necessary, from time to time, to secure the maintenance of the price level within the pre-determined maxima and minima; and thirdly, the maintenance of an organization to carry out the measures decided upon. The system of regulation need not be, and would indeed not be, identical with the system of food administration which is functioning to-day, but it is certain to include some of the features of the present system. The control of imports of cereals would certainly be an important feature of the future system. It is not our purpose to discuss in detail a plan for the regulation of prices in normal times; such a plan can be settled satisfactorily only on the basis of actual experience of the operation of food controls during the period of transition immediately following the end of the war. We wish to emphasize here that the objectives of long-term food policy are relevant to the problems of the transition period and should be prominently kept in mind. The organization of food administration during the transition period should be designed, not with the object of securing the most expeditious return to pre-war conditions, but so that it can evolve into a system of regulation of prices in normal times.

4. The main features of the foodgrain situation to-day are, broadly, as follows: First, a shortage of internal supply, production in an average season being smaller than consumption requirements, including those of the defence services, and the level of stocks carried in the country lower than stocks carried at corresponding periods in normal times; secondly, shortage of imports from abroad involving in particular the lack of imports of rice; thirdly, transport congestion requiring stringent restrictions; and fourthly, an abnormal price level, which is unduly high generally, presents undue disparities between different parts of the country, and makes continuous action by Government necessary in order to secure the equitable distribution of available supplies within pre-determined price maxima. No material change in the prevailing conditions can be anticipated until after the re-conquest of Burma is completed and the movement of rice from Burma to India is re-established.

5. The transition period which we visualize may, therefore, be regarded as commencing with the arrival of the first shipments of rice from Burma in appreciable quantities. Its duration will depend on a number of factors many of which will not be within the control of Governments in India. Among the more important of these factors, we would mention the following: First, the imports of rice from Burma should increase until they can bridge the gap between production and consumption in India

and allow for the replenishment of stocks; secondly, transport conditions in India should return to normal, that is, the need for restrictions on movement by rail, river steamer and coastal shipping should disappear; thirdly, the present world shortage of food as well as shipping should no longer exist; and fourthly, demobilization should have been completed. We cannot foresee when these conditions are likely to be satisfied. It is clear, however, that the process is bound to take several years. The period of violent disturbances in the food economy of the country started in 1942–43 and it is, in all probability, unsafe to assume that the necessary readjustments would be complete within a period much shorter than ten years from that date. We, therefore, assume that the transition period may last until 1951–52.

6. As the first stage in the transition we visualize a period of approximately three years during which the imports of rice arriving from Burma will gradually increase in volume. The position in respect of imports of wheat will depend largely on world conditions, and we hope it may be possible to meet the requirements of India, which are likely to diminish after the cessation of hostilities in the East. The supplies of rice and wheat will be imported from abroad by the Government of India and distributed under the Basic Plan. With the help of these, we think, it should be possible to secure two important purposes, namely, first, the diminution and eventual elimination of the wide price disparities which at present exist in different parts of the country, and secondly, the gradual withdrawal of the more stringent forms of control.

7. [1]We have endeavoured to form some idea of the relation between the prices of rice and wheat in different parts of the country with pre-war prices, and the extent to which they are out of parity with one another. This has not proved easy because of the imperfections of the available statistics of prices. A review of the available statistics, such as they are, has been made and the results are given in a note appended to this report [2]. The broad conclusions are as follows: Assuming the average of the quinquennium ending 1938–39 to represent the pre-war level, the prices of rice in Bengal (the most important producing province) appear, after their extravagant rise in the famine period, to have come down to somewhere about 350 per cent of the pre-war level. In Madras (the next most important producing province) the price of rice is held at or somewhat below 250 per cent. The prices in Assam, Bihar and the United Provinces tend to approximate to the Bengal level, that is, approximately 350 per cent. The level is somewhat lower in the Punjab and still lower in the Central Provinces, where it is roughly about 300 per cent

[1] The figures in this paragraph are only approximate estimates and refer to the position reached by the end of 1944.

[2] Appendix IV.

of the pre-war level. Prices in Sind are practically on a par with those in Madras, in the neighbourhood of about 250 per cent. Wheat prices appear to be generally in the neighbourhood of 350 per cent of the pre-war level, except in Sind where they are about 300 per cent. We think it is clear that it should be the common aim of all Governments concerned to secure, as early as supply conditions in the transition period permit, that the prices both of rice and wheat in different parts of the country should be brought down to normal parity with the level of rice prices at present prevailing in Madras and Sind. Precisely what this would mean in terms of rupees and annas per maund for different grades of rice and wheat in different areas for different types of transactions would require to be worked out. We believe that, if the actual prices which prevailed during the quinquennium ending 1938–39 were worked out in each province, and a price in the neighbourhood of 240 per cent of such average were determined, the result would broadly represent the target price level to be aimed at at the end of the first stage of the transition period. We do not imply that the proportion should be identical in all provinces. But we feel that the fixation of a price as near as possible to 240 per cent of the pre-war level, would be appropriate in the major producing provinces, that is, in Bengal and Madras for rice, and the Punjab and the United Provinces for wheat, and if prices are fixed in other provinces in normal parity with such prices, they are unlikely to be very much in excess of or very much below 240 per cent.

8. Concurrently with the reduction of prices to the lowest level prevailing at present, we suggest that the distribution of imported supplies should be organized so as to facilitate the withdrawal of the more stringent forms of control. Thus, total procurement and levy schemes (including rationing in rural areas) and other systems of monopoly purchases from the producer, should be withdrawn first. As supply conditions further improve restrictions on movements within a province or state should be relaxed, and rationing withdrawn in smaller towns and then in larger towns. Rationing in the larger cities would probably have to continue for some time longer. Thus, by the end of the first stage of transition, the functions performed by the Central Government would continue to be performed without any alteration, the Basic Plan would continue to be in operation, the existing cordons around the provinces and states would remain, but considerable changes would have occurred in the methods of food administration in those provinces and states, where more stringent forms of control are in force than are at present adopted in certain other provinces, of which the Punjab is a good example. Trade would be operating under licence. Procurement schemes would be based on purchases from the local trade. Only the large cities would be subject to rationing. In general, local food administration in all parts of India would present characteristics of food administration in the Punjab at present.

9. The second stage of the transition would then begin. The main problems of this period would be the co-ordinated removal of cordons around provinces and states, and the retransfer of the responsibility for distribution of supplies from Government agencies to the trade—while, at the same time, Governments should be prepared to reintroduce controls should this be necessary and to ensure the maintenance of the price level within pre-determined limits.

It is at this stage that the technique of preventing the price level from falling below a pre-determined minimum, under conditions in which the distribution of supplies is carried out by the normal trade machinery, should be perfected. The methods of preventing prices from rising higher than a pre-determined maximum have now been fully learnt and tested in practice. But conditions of supply have been such that no real test has been made of the methods of preventing prices from falling below a pre-determined minimum. The need for the development of such methods would, in our opinion, certainly arise during the second stage of the transition period. At that time, the Basic Plan would be in operation and imports would be under the control of the Government of India. Considerable stocks would be available in the hands of the Central and Provincial Governments which would constitute the nucleus of a system of buffer stocks; and though the distribution of supplies would be normally made through trade channels, an organization would be available for making purchases in the open market when the price level tends to fall below the pre-determined minimum. Under these conditions we believe that prices can be effectively prevented from falling below a pre-determined minimum.

10. The level to which prices have been brought down at the end of the first stage of the transition should be, as we have suggested, approximately 240 per cent of the pre-war level. This, we propose, should be fixed as the maximum for the second stage, while the minimum should be fixed at approximately three-quarters of the maximum, that is, at about 180 per cent of the pre-war level. The margins between the maxima and the minima would thus be fairly wide. An attempt should be made to secure that the prevailing price level of foodgrains, within these limits, is maintained in equitable relation to the prevailing prices of essential commodities of rural consumption, such as, cloth, kerosene, etc. We have suggested three-quarters of the maximum rates as suitable minimum rates for the second stage of the transition period, mainly because our review of the course of prices before the present war indicates, that the minimum we have suggested would be generally just below the average price level which prevailed during the quinquennium immediately preceding the economic depression. The maintenance of such a level, as the minimum during the second stage of the present period is, in our opinion, essential to the orderly development of the country's

economy, and we believe that it is only by setting before themselves, in concrete terms, a definite task to perform during the transition period, and actually solving the problems involved as they arise, that Governments would acquire the basis of practical experience on which a system of regulation of prices suitable for normal times can be devised and operated.

11. We wish to draw attention to the importance of co-ordinated action in the transition period, particularly in regard to the removal of cordons around provinces and states. It is desirable that the gradual transfer of responsibility for the distribution of supplies from Government agencies to normal trade machinery, should be effected as soon as supply and price conditions permit. From this point of view it may not be possible at any one time to remove all the cordons around all the provinces and states; and we do not think it necessary or desirable to postpone the removal of the cordons round certain provinces, where this has become possible, until a similar stage is reached in all parts of the country. This consideration indicates that a regional grouping of provinces and states, and the establishment of an effective machinery for co-ordinated action by the different local administrations within each region, will become a matter of increasing importance during the next few years, and an absolute necessity when the time arrives for the removal of cordons. For this purpose, we suggest that Regional Food Councils should be constituted, consisting of representatives of the Governments of Provinces and States in each region. We have carefully considered the question whether, at the stage we are considering, it would not be a convenient arrangement that all functions in regard to the regulation of supplies and prices, should be vested exclusively in the Centre. We feel that this would not be desirable. We are of the opinion that the division of functions between the Central Government and the Provincial Governments at present existing in the field of food administration, is sound and must continue. Within the existing scheme of responsibility, we consider that a special need for regional co-ordination will arise in the transition period, and that the Regional Food Councils should meet that need. The functions of the Councils would be advisory and not executive. They should be co-ordinating bodies established by local administrations and not an agency responsible to the Centre. They should advise local administrations on the steps to be taken by them to secure, within the region, the co-ordinated removal of cordons, the maintenance of supplies through inter-provincial and state trade, the execution of a common price policy for the region within the framework of an all-India price policy, and the fulfilment, in respect of the region, of the All-India Basic Plan.

12. We shall now turn to the question of the relations between the Provinces and the Centre, with reference to the progressive evolution of an all-India food policy, the planning of the measures necessary from time to time for solving the problems presented by

changing conditions, and securing the co-ordinated execution by the Centre and the Provinces, in their respective spheres, of the measures decided upon. On this subject the position is described to us in the following terms by the Food Department of the Government of India in a memorandum furnished to us last year (1944):—

Under the Government of India Act, trade and commerce within a province, production, supply and distribution of goods and agriculture are all provincial subjects. The Government of India in discharging its responsibility for the conduct of the war, including a general responsibility for conserving, augmenting and distributing the food resources of the country, came frequently into contact and sometimes into conflict with the executive authority of the Provincial Governments in regard to these subjects. . . The relations between Provincial Governments and between Central and Local Governments, were not always easy where local interests did not coincide with the wider needs of the whole country; but as a result of the successive All-India Food Conferences there have developed some signs of a better understanding between Governments of each other's difficulties, and a greater degree of co-operation towards a common end. Nevertheless, the Central Government's position is still far from satisfactory. Provincial exclusiveness and resistance to Central interference or control is still strong. The Central Government have accepted the responsibility for the success of food administration throughout India. In the discharge of that responsibility, the Government of India endeavour to exercise a close watch over the proceedings of Provincial Governments within their jurisdiction at every stage. Superintendence and control have, however, to be exercised with judgment and discretion. The Government of India have not and cannot assume direct responsibility for the details of the day-to-day administration in every province. Whenever a difference of opinion on policy or method arises, or a defect in the administration manifests itself, the Government of India have to consider, first, whether their active intervention is essential, secondly, what manner of intervention is most suitable and likely to achieve the purpose in view, and thirdly, the extent to which it must be pressed. In a constitution of a federal nature, the constituent units, especially where a popular ministry is involved, must be allowed due scope in the exercise of the responsibilities with which they are charged. It must be remembered also that the Government of India depend upon the administrative machinery which the provinces, and not they, possess to carry the policy into effect. . . Although, therefore, there have been occasions when the Government of India have felt bound to press their view to the extent of issuing a Direction, there have also been, and will doubtless be, others in which, though not fully satisfied, the Government of India have not felt justified in pressing their opinion to the length of using the emergency powers of the Government of India Act . . .

13. We may say at once that we are impressed on the whole by the satisfactory character of the relations which exist at present between the provinces and the centre. We do not take an unduly serious view of the differences which manifested themselves in the past. To some extent, they were inevitable in the circumstances of the critical situation which developed during 1942 and 1943, against a background of unpreparedness. But, in envisaging

the future of food administration in the country, the problems which await solution in the future, and the need for the centre, the provinces as well as the states to act together as one unit in the planning and execution of the measures necessary to solve those problems, we are convinced that the establishment of a permanent and recognized machinery for co-ordinating food administration at the centre as well as in the provinces and states is necessary. A suitable model for such machinery already exists (as the passage we have quoted above indicates), in the All-India Food Conferences summoned by the Central Government from time to time. These were attended by duly authorized representatives of the Central and Provincial Governments and of the Indian States, possessing administrative experience and technical knowledge of the problems which came up for discussion. We suggest that, in the place of these *ad hoc* conferences summoned at irregular intervals, a permanent organization should be established which may be called the All-India Food Council. It should consist of representatives of the Government of India in the departments concerned and the representatives of the Provincial and State Governments. It should be recognized, both by the Central Government and the Governments of Provinces and States, as the common organ for co-ordinating the activities of these Governments in framing and executing a common food policy for the country as a whole. It should meet at regular intervals, say once every half-year. We recognize that its legal status must be that of an advisory body; its conclusions would bind the Governments—Central, Provincial or State—only upon acceptance by the latter. This should not in any way detract from the usefulness of such a body, because we are convinced that its conclusions would carry such weight with the Governments concerned as to permit the development of a healthy convention, that its conclusions should be accepted except for very gravest reasons to the contrary. We also feel that in those exceptional instances where the Central Government may have to issue a Direction to any province, public opinion is likely to support the Central Government when they exercise their over-riding authority with the support of an All-India Food Council.

14. It has been suggested that, in view of the large number of provinces and states which have to be represented, the Food Conferences have been somewhat unwieldy bodies and may not, therefore, be a suitable pattern for the constitution of an Indian Food Council. This is not in our opinion an insuperable objection. It should be possible to limit the numbers in such a manner as to secure a body which is not too unwieldy. Thus, each province may be represented by only one member who should be in a position to speak authoritatively on behalf of his Government, normally a Minister or Adviser. The larger states may be similarly represented at the highest level, and some system might be devised for grouping the smaller states for purposes of choosing one representative for each group. We think it would be necessary that the Council should be presided over by a Member of the Government of India. Consistent with our proposal that

the All-India Food Council should be a permanent body, and that it should not be merely an organ of the Central Government but a common organ of the Central Government and the Governments of the Provinces and the States, we think it is desirable that it should have a small staff of its own, with a Secretary who might suitably be an officer attached to the Food Department of the Government of India.

15. We are not, it may be added, in favour of multiplying the number of consultative bodies associated with the Central Government, as we recognize that a considerable amount of time and labour has to be spent by the departments concerned with the meetings of such bodies. We hope, therefore, that the All-India Food Council would be recognized as the sole authoritative organ of consultation on matters of food policy and administration. The need for referring such matters to other committees and councils would greatly diminish in consequence.

16. From what we have said, it will be clear that we visualize the continuance, during the immediate post-war period, of the existing organization of the Food Department at the Centre. It is obvious that for some time to come it will have to perform functions of substantially the same character as at present. Towards the end of the period we have been considering, we anticipate that much of the work of the Food Department relating to the defence services is likely to diminish, while, the activities of that part of the Education, Health and Lands Department, which deals with agriculture, are likely to increase because of post-war development in food production. In view of the close connection between the duties of the Centre in executing a common food policy for India and the development of agriculture, generally, we think it will be convenient in due course, to constitute a single department at the Centre which will deal with both Food and Agriculture and whose functions are limited to these two subjects only.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

17. Our conclusions and recommendations are—

(i) The process of relaxation of existing controls is bound to present difficult problems which require to be studied in advance, and preparations for their solution must be made before they arise.

(ii) The return to normal conditions must be a gradual, regulated and co-ordinated process; otherwise the chaotic price and supply conditions which prevailed in many parts of the country in the summer of 1942 and during the greater part of 1943, may recur.

(iii) The permanent objectives of food policy have a bearing on the problems of the transition period and must be prominently kept in mind in considering these problems.

(iv) The organization of food administration during the transition period should be designed, not with a view to securing the most expeditious return to pre-war conditions, but so that it can evolve into a system of regulation of prices in normal times.

(v) The transition period may be regarded as commencing with the arrival of the first shipments of rice from Burma in appreciable quantities. Its probable duration is unpredictable; it may last until 1951–52.

(vi) During the first stage of the transition period, it should be possible to secure the diminution and eventual elimination of wide price disparities at present existing in different parts of the country.

(vii) If the actual prices which prevailed during the quinquennium ending 1938–39 are worked out in each province, and a price in the neighbourhood of 240 per cent of such average determined, the result would broadly represent the target price level to be aimed at at the end of the first stage of the transition period.

(viii) Concurrently with the reduction of prices the more stringent forms of control should be withdrawn.

(ix) The main problems of the second stage of the transition would be the co-ordinated removal of cordons around provinces and states, and the re-transfer of the responsibility for distribution of supplies from Government agencies to the trade. At the same time Governments must be prepared to reintroduce controls should this be necessary, and to ensure the maintenance of the price level within pre-determined limits.

(x) Effective methods for preventing the price level from falling below a pre-determined minimum should be perfected at this time.

(xi) During this stage the price level should not be allowed to exceed 240 per cent of the pre-war level, that is, the average of the quinquennium ending 1938–39, nor allowed to fall below 180 per cent of the pre-war level.

(xii) The maintenance of the suggested minimum level during the stage of the transition period is essential to the orderly development of the country's economy.

(xiii) It is only by setting before themselves in concrete terms a definite task to perform during the transition period, and actually solving the problems involved as they arise, that Governments will acquire the basis of practical experience on which a system of regulation of prices suitable for normal times can be devised and operated.

(xiv) A special need for regional co-ordination will arise in the circumstances of the transition period, and the establishment of Regional Food Councils consisting of representatives of the Governments of Provinces and States in each region is recommended.

(xv) The functions of Regional Food Councils should be to advise provincial and state administrations on the steps to be taken by them in order to secure, within the region, the co-ordinated removal of cordons, the maintenance of supplies through inter-provincial and state trade, the execution of a common price policy for the region within the framework of an all-India price policy, and the fulfilment, in respect of the region of the all-India Basic Plan.

(xvi) The need also exists for the establishment of a permanent and recognized machinery for co-ordination of food administration at the Centre as well as in the Provinces and States.

(xvii) A suitable model for such machinery already exists in the all-India Food Conferences. We suggest that, in the place of *ad hoc* conferences summoned at irregular intervals, a permanent organization should be established which may be called the All-India Food Council.

(xviii) The All-India Food Council should be recognized, both by the Central Government and the Governments of Provinces and States, as the common organ of co-ordination of the activities of these Governments in framing and executing a common food policy for the country as a whole.

(xix) The existing organization of the Food Department at the Centre will have to continue during the immediate post-war period and to perform functions of substantially the same character as at present.

(xx) We think it would be convenient in due course to constitute a single Department at the Centre which would deal with both Food and Agriculture and whose functions would be limited to these two subjects only.

PART II

POPULATION, NUTRITION AND FOOD POLICY

PART II

Population, Nutrition and Food Policy

CHAPTER I.—POPULATION

We propose to consider at some length the question of population because of its important bearing on the principal items in our terms of reference—the development of agricultural resources and the improvement of nutrition. We have attempted to give an objective account of a controversial subject and where we have quoted views other than our own we have done so for purposes of illustration and with no implication that we agree with them. At the outset we may draw attention to certain points which should be borne in mind in the perusal of the chapter. In the first place, writers on population problems in India are sometimes unconsciously influenced by the mere size of the numbers with which they are concerned, and confuse the idea of a very large population with that of over-population. India is a large country and has a large population of some 400 millions, but *a priori* this figure is of little significance. A country is over-populated or under-populated only in relation to its area and resources. Secondly, while we hold that there is a serious population situation, we emphasize throughout that the *primary* problem is that of under-development of resources, both agricultural and industrial, in a wide sense of the term.

The Growth of Population

2. Little is known about the size of the population during the long centuries of Indian history between the dawn of civilization and first census in 1872. The estimate of 100 millions at the beginning of the seventeenth century—one-quarter of the present figure—is familiar, but as Carr Saunders[1] points out, "it is a mere guess taken from Moreland's description of the state of India at the death of Akbar in 1605. Moreland's figure has been quoted with favour in the census report of India; no better estimate is available, but its factual basis is of the most slender kind." All that can indeed be said is that in the historical past the population of India, like that of Europe, was much smaller than that at the present time. There is some evidence that during the first three-quarters of the nineteenth century, as peace and stability replaced the turmoil of the preceding century, a considerable increase in population occurred. This is attested by some imperfect figures for Madras, a pioneer province in census taking, which are quoted in the Madras Census Report of 1931. According to these figures, which represent the results of nine attempts in enumeration between 1802 and 1866, the popuplation increased from 9·5 millions in 1802 to 15·5 millions in 1831, and reached 26·5 millions in 1866. Both the areas covered and the method of enumeration differed, however, throughout the series,

[1] World population—1936.

and the results can be accepted only as indicating in a rough way that the period was one of rapid population growth in this part of India.

Since 1872 a census has been taken in every decade. The census figures are reasonably accurate—more so, for example, than statistics of births and deaths—and the existence of such figures covering nearly three-quarters of a century is an enormous asset in the study of population problems in India. If, as in China, the total population could not be estimated to within a hundred million, no rational discussion would be possible. The following figures show the growth of population in India, which includes British India and the Indian States, from 1872 to 1941:—

Census.	Population (Millions.)	Increase per cent since previous census.
1872	203	..
1881	250	23·2
1891	279	11·6
1901	284	1·8
1911	308	6·7
1921	306	1·0
1931	338	10·6
1941	389	15·1

Part of the large increase between 1872 and 1881 was due to the inclusion of new territory in the census area. The slow rate of growth from 1891 to 1901 was due largely to famines, and that from 1911 to 1921 at least to a considerable extent to the formidable influenza epidemic of 1918–19, which is said to have caused 13 million deaths. The two decades from 1921 to 1941 were decades of steady growth. Of the total population of 389 millions, recorded in 1941, 296 millions were in British India and 93 millions in States and Agencies.

The numbers added to the population during the decade 1931-41 exceed the total population of England and Wales. India (with the possible exception of China) is unique among countries as regards the *size* of her contribution to world population growth. The *rate* of increase has not, however, been remarkably rapid, in comparison with that of certain other countries. In the Census Report of 1931 the following figures (1872–1931) are given as representing real increase, allowance being made for the inclusion of new areas and improvement in the method of enumeration, which, it has been estimated, had the effect of adding some 57 millions to the census returns from 1872 to 1901:

Period.	Percentage of real increase.
1872–1881	1·5
1881–1891	9·6
1891–1901	1·4
1901–1911	6·4
1911–1921	1·2
1921–1931	10·6
1931–1941	15·1

According to these figures the increase from 1872 to 1931 was 30 per cent. In England and Wales during the same period an increase of 77 per cent took place. In few other countries is the rate of increase during this period accurately known. In France it was considerably lower than in India, while in the United States of America it was more rapid than in England, largely, no doubt, because of immigration. During the years 1921 to 1941 India was free from major famines, and no abnormal mortality from epidemic disease, such as that caused by plague and influenza during the previous 20 years, took place. We may reasonably conclude that the relatively slow and fluctuating rate of growth during most of the period for which census figures are available, was due to high mortality from disease and famine, and that in the absence of these checks the population would now be considerably greater than it is.

Birth and Death Rates.

3. The birth and death rates for British India during the four decades from 1901 to 1940 and the subsequent years 1941–43, are shown below. The figures are those of the Public Health Commissioner with the Government of India, recorded to the nearest integer:

Period.	Birth rate per mille.	Death rate per mille.
1901–1910	38	34
1911–1920	37	34
1921–1930	35	26
1931–1940	34	23
1941	32	22
1942	29	21
1943	26	23

During the present century up to 1940, the recorded birth rate was relatively constant with perhaps a slight tendency to fall. The significance of the recorded fall in 1942 and 1943 cannot at present be assessed; it may not persist throughout the present decade. The death rate, on the other hand, is steadily declining, the rise in 1943 being largely due to the Bengal famine and in all probability a temporary phenomenon. Among the most important causes of the reduction in the number of deaths are the steady decline in the infantile mortality rate, which fell from 195 in 1920 to 160 in 1940, and the decrease in mortality from cholera and plague. Since registration is improving, the real decrease in the death rate may be greater than the recorded figures suggest. There are immediate possibilities of bringing about a further considerable fall in the death rate by the improvement and development of public health organizations and activities in general, and notably by measures designed to reduce maternal and infant mortality.

Leaving aside the birth-rate figures for 1942 and 1943, we may say that during the last few decades the excess of births over deaths has increased. If the tendencies shown by the recorded birth and death rates during the present century up to 1940 persist,

an *increase* in the rate of growth of the population is to be anticipated. In this connection there is another important point which must not be overlooked. According to the report of the Public Health Commissioner with the Government of India (1936) the number of births in the country as a whole may be underestimated by 20–25 per cent, because of omissions in registration. On the other hand, omissions in the registration of deaths are less frequent and the probable percentage error in total mortality statistics is considerably smaller. The growth capacity of the population may thus be greater than the recorded excess of births over deaths within recent decades suggests.

Density of Population

4. The density of population in India as a whole, the larger provinces and a number of the larger states, is as follows (1941 census):—

Population per square mile— All-India (British India and the Indian States)	246	British India	341
	Provinces.		
Bengal	779	Orissa	271
Bihar	521	N.W.F.P.	213
United Provinces	518	Assam	186
Madras	491	Central Provinces and Berar	170
Punjab	287	Sind	94
Bombay	272	Baluchistan	9
	States.		
Cochin	952	Mysore	249
Travancore	792	Hyderabad	198
Baroda	345		

This may be compared with the figures of density of population in (or about) 1937 for certain other countries:

Belgium	710	Italy	359
England and Wales ..	703	France	197
Japan	482	United States	43
Germany	373	New Zealand	16

Among the provinces Bengal, Bihar and the United Provinces and among the states Cochin and Travancore, stand out as being the most densely populated. At the other end of the scale is Baluchistan, mostly mountain or desert, with only 9 inhabitants per square mile. In Bengal density exceeds 1,000 per square mile in the rural districts of Faridpur, Noakhali, Dacca and Tipperah, the figures for the last two being 1,542 and 1,525, respectively. In Bihar, three districts, Saran, Muzaffarpur and Darbhanga, and in the United Provinces, Benares, are just over the thousand mark. In no other rural district in British India does the density exceed 1,000 per square mile. The two most thickly populated districts in Madras are Tanjore and Malabar, with population densities of 686 and 679 per square mile respectively. Comparison of the density of population in areas of different size including different kinds of land in varying proportion can, of course, give only an approximate idea of density in

relation to the food and the agricultural resources of the area concerned. The latter could be determined only by detailed and prolonged investigation.

Deltaic areas such as Bengal, with abundant water-supply, the great river valleys, and the strip of fertile land between the Western Ghats and the sea along the south-west of the peninsula, are all densely populated. Canal-irrigated areas support a dense population when they are fully developed, as in the irrigated deltas of the Madras Presidency; in the canal zones in the Punjab and Sind population is growing rapidly but the stage of high or maximum density has not yet been reached. Unirrigated areas of low rainfall carry a much smaller population and there are vast tracts of forests, mountain and desert which are sparsely inhabited or devoid of inhabitants.

LAND AND FOOD PRODUCTION

5. The total land area of India is 1·58 million square miles, or about 1,000 million acres. Of this, 512 million acres are in British India. According to statistics for 1940–41, land in British India can be classified as follows:—

	Million acres.
Cultivated area—	
Net area sown	214
Net area under food crops	170
Current fallows	45
Uncultivated area—	
Not available for cultivation (desert, etc)	87
Forest	68
Other uncultivated land	98

In some of the cultivated areas more than one crop is sown during the year. The *gross* area sown, which includes all sowings was reported as 248 million acres in 1940–41, and the gross area under food crops as 198 million acres. We give below *per capita* acreage, estimated in various ways, on the basis of the census figure (296 millions) for the population of British India in 1941:

	Acres per capita (British India.)
Total area	1·75
Gross area sown	0·84
Plus current fallows	0·99
Gross area under food crops	0·67
Plus current fallows	0·82
Net area sown	0·72
Plus current fallows	0·87
Net area under food crops	0·57
Plus current fallows	0·72

In some of the most densely populated provinces the above ratios are considerably smaller. The following is an extract from a report presented to us by the Government of Bihar:—

Between 1921 and 1941 the population of Bihar increased from 29 millions to 36, while during the same period the total cultivated

area fell from 26 to 25 million acres. Thus the same or slightly diminished area of land has to support a very much higher population with no striking advance in the methods employed for agricultural production. The total average area under food crops in the quinquennium ending 1941–42 was about 19·5 million acres (including about 4 million acres sown more than once), i.e., about 0·5 of an acre per head of population. In Bihar even if all the cultivable waste (6·5 million acres) is brought under cultivation, there will be little less than an acre per head of population.

The results of dividing the net area sown, as reported in the Government of India publication " Statistics of Area and Yield," by the census figures are shown below, the period covered being 1911 to 1941. A steady decline in the *per capita* area sown is revealed by this method of calculation.

Net per capita area sown (British India).

Year.	Population (millions).	Average net area sown* (million acres).	Per capita area sown (acres).
1911	231·6	208	0·90
1921	233·6	205	0·88
1931	256·8	211	0·82
1941	295·8	215	0·72

The proportion in various provinces of uncultivated land, other than forests and land not available for cultivation, to cultivated land including current fallows is shown below. The figures are as reported by the provinces for 1940–41.

Provinces.	Cultivated land including current fallows.	Total area excluding forests and lands not available for cultivation.	Percentage of column (2) to column (3).
(1)	(2) ('000 acres.)	(3) ('000 acres).	(4)
Assam	8,923	26,603	34
Bengal	30,064	36,097	83
Bihar	24,770	31,199	99
Bombay	33,765	34,697	97
Central Provinces and Berar..	28,276	42,355	67
Madras	41,278	52,594	78
North-West Frontier Province.	2,737	5,548	49
Orissa	7,690	10,956	70
Punjab	31,235	45,221	69
Sind	10,282	21,430	48
United Provinces	39,050	48,898	80
Total British India ..	259,216	357,075	73

According to the Royal Commission on Agriculture (1928), " a large proportion of culturable land other than fallow could in no conceivable circumstances be brought under tillage," since it

*Represents the average for five years with the census year as the central one.

consists for the most part of land too poor to give economic returns. In certain provinces an attempt has been made to estimate the proportion which can be regarded as " culturable." The available figures which refer to 1940–41 are as follows:—

	Uncultivated land excluding current fallows.	Culturable area of land so described.
	ACS.	ACS.
Bengal	6,033,983	142,960
Bombay	931,918	181,073
Central Provinces and Berar ..	14,079,275	5,147,663
Punjab	13,986,465	3,781,068

This is in general conformity with the finding of the Royal Commission on Agriculture and suggests that in India as a whole a high proportion of the area described as " uncultivated " is in fact unsuitable for cultivation. It is not, however, clear whether a complete survey of " culturable " land has been carried out even in the provinces mentioned above. In quoting the views of the Royal Commission on Agriculture on " cultivable land other than fallow," it must be added that land which is at present too poor to give economic returns to ignorant ryots without capital or scientific resources, may be capable of development by irrigation schemes and application of scientific methods of land reclamation and soil improvement.

Diet and Land Area.

6. Let us refer once more to the objective of " improving the diet of the people." It is clear that if an agricultural population has to live on the food which it itself produces, the amount of land available *per capita* must at least be sufficient to provide enough calories to satisfy hunger. But apart from this obvious fact there is another relation between diet and land which is of the utmost importance. More land is needed to produce a well-balanced diet containing an abundance of protective foods than an ill-balanced diet of similar calorie value consisting mainly of cereals. To produce 1,000 calories in the form of milk requires from three to four times as much land as to produce 1,000 calories in the form of wheat or rice. To put it in another way, land devoted to fodder crops or grazing cannot return as many calories per acre, in the form of milk, as the same land sown with cereals or tubers. Similarly, fruit and vegetables in general, eggs and particularly meat give a lower calorie return per unit area than the energy-yielding crops. It follows, therefore, that if the amount of land available *per capita* is small, it must, if the population it supports is to obtain enough to eat, be devoted to the production of foods which give a high calorie return. Wherever we find, anywhere in the world, a dense population dependent on agriculture, we also find a lack of protective foods because the pressure on land does not permit their production in sufficient quantities.

In this connexion we may refer to the results of certain studies made by workers in the United States, which have long been

familiar to nutrition and agricultural experts, but will bear repetition. In these investigations[1] four diets were drawn up as follows:—

(*a*) An "emergency restricted diet." This diet consisted largely of cereals and was designed to tide very poor and destitute people, e.g., the unemployed, over a comparatively short period of privation.

(*b*) An "adequate diet at minimum cost." This was a more expensive diet, including less cereals and rather more milk, meat, fruit, and green vegetables.

(*c*) An "adequate diet at moderate cost." This was roughly similar to (*b*) but was richer in milk and other nutritious foods.

(*d*) A "liberal diet." In this diet the proportion of cereals was reduced to 100 lb. per year, a quart of milk per day was included, and meat, fruit and green vegetables were added in maximum quantities.

Diets (*b*), (*c*) and (*d*) are similar in energy value, while that of diet (*a*) is slightly less.

The amount of land *per capita* required (in the United States of America) to produce these various diets was calculated by an agricultural expert (Dr. O. E. Baker).[2] The acreage was as follows:—

Diet.	Acres per capita.	Diet.	Acres per capita.
(a)	1·2	(c)	2·3
(b)	1·8	(d)	3·1

In a previous paragraph it has been shown that the net area *per capita* under food crops in India (including current fallows) is 0·72 acre. The difference between this figure and the acreage which according to the above estimate is required to yield the various kinds of diet is indeed striking, but agricultural conditions in United States of America and India are very different and a direct comparison is scarcely justified. We quote the American investigations here in order to illustrate the fact that the density of the agricultural population has a direct bearing on the potential production of certain kinds of protective foods.

Agriculture and Industry

7. According to the census report of 1931, 67·9 per cent[3] of the population at that date was supported by agriculture and 9·7 per cent by industry. Owing to some lack of uniformity in classification in the census returns, it is difficult to draw conclusions with regard to the proportions similarly occupied during the 40 years

[1] Stiebeling and Ward. U.S. Department of Agriculture Circular No. 296, 1933.

[2] The Future Need for Farmland. U.S. Department of Agriculture—1934.

[3] This percentage is smaller than that given in the 1921 Census report, which is 72·4. The Census Commissioner (1931) points out, however, that the decrease is more apparent than real. "The change" he remarks, "is due to the number of females . . . who have returned their occupation as domestic service. In 1921 these would have appeared as workers (mainly if not entirely agricultural) in the occupations in which they assisted the male members of their families."

previous to 1921, but the available evidence suggests that the percentage dependent on agriculture *increased* during this period. In the report of the 1880 Famine Commission, the percentage of the male population engaged in industry is given as 12·3. The decline in rural industries, which had the effect of driving people back on the land and increasing the number of landless agricultural labourers, is the probable explanation of this occupational trend.

The 1941 census report unfortunately does not include occupational statistics, such tabulation having been excluded from the tabulation operations sanctioned by the Government of India. It does, however, draw special attention to the growth of the population of large cities during the previous decade, and the increase in the number of such cities. "The number of cities with a hundred thousand inhabitants or more was 35 in 1931 and is 58 now. The population living in cities of this size has increased over the decade from 9·1 to 16·5 million, a rise of 81 per cent which is a notable contrast with the 15 per cent increase over the whole country." Relevant figures are as follows:—

	1941 (millions).	Percentage of total population.	1931 (millions.)	Percentage of total population.
Total population	389·0	100	338·1	100
In rural areas	339·2	87·2	300·7	88·9
In towns with 100,000 inhabitants or over ..	16·5	4·2	9·1	2·7
In towns with 20,000 to 100,000 inhabitants ..	15·0	3·9	28·3	8·4
In towns with 5,000 to 20,000 inhabitants ..	18·3	4·7		

The rapid growth of large cities during the decade is a striking phenomenon, and there can be little doubt that since 1941 considerable further growth has taken place. How far the concentration of industry in a relatively small number of urban centres is desirable we need not discuss here. It is to be observed that the number of people inhabiting smaller towns increased by only 5 millions and their proportion to the total remained almost unaltered. Many would prefer to see a more even spread of industry, involving small towns as well as large. The extension of cheap electric power would further such a spread.

The fact, however, that during the decade 1931 to 1941 some 7 millions were added to the population of large cities, and that since 1941 the process has continued, should not convey the impression that India is now becoming an industrial rather than an agricultural country. During the same decade the non-urban population increased from 300 to 339 millions, and its percentage to the total fell only from 88·9 to 87·2. Previous to 1931 the percentage of the population dependent on agriculture appears to have been increasing. Whatever the future prospects of industrial development, India is at the present time essentially a country of agriculturists.

Ideas about Population

8. To trace in detail the history of thought about population would be beyond the scope of this report. It is, however, important to refer to certain basic trends in population theories. Throughout the nineteenth century the influence of Malthus on population theory remained paramount; attention was focussed on the danger of over-population, and the potentialities for a rapid decrease in the rate of population growth, and for increase in food production by the application of scientific methods to agriculture were not fully realized. Actually, the course of events showed that one of the basic hypotheses of Malthus—that whereas population increases by geometrical progression, food production can increase only by arithmetical progression—was quite erroneous. He did not foresee, and could not have foreseen, the opening up, in the Americas, Australia and elsewhere, of vast areas of land which has enormously augmented the world's food supply, and the increased productivity resulting from the scientific development of agriculture. Nor could he have foreseen the slackening of population growth in the West. It is well known that at the present time most western countries are faced with the prospect of a fall in population, resulting from a remarkable decrease in the birth rate during the last half century or so, and the change in age distribution which the decrease has occasioned. In most countries the population is still rising, but the scientific study of demographical facts clearly indicates the existence of factors leading to cessation of growth and subsequent decline. The process can only be checked by a substantial and permanent rise in the birth rate to a point considerably above existing levels.

It is natural in such circumstances that the question of over-population, and the relation between population and food supply, should have receded into the background. When the future development of agriculture and the improvement of nutrition on a world scale were discussed at the United Nations Conference on Food and Agriculture in 1943, the problem of over-population received relatively little attention. The Conference, holding steadily in view the principle that the potentialities of science, and the power of man to control his environment, are unlimited, made the following declaration:—

"There has never been enough food for the health of all people. This is justified neither by ignorance nor by the harshness of nature. Production of food must be greatly expanded; we now have knowledge of the means by which this can be done."

The high optimism of the Hot Springs Conference has had salutary repercussions on India. It has prompted agricultural authorities to consider far-reaching developments in agriculture and animal husbandry, the object of which is to raise standards of nutrition to satisfactory levels. We are ourselves in full sympathy with the spirit of progress, the dissatisfaction with existing conditions and the determination to ameliorate them, which animated the delegates. Nevertheless, in planning the development of India, careful consideration must be given to the factor

of population growth and its bearing on food supply. This is necessary if only because certain writers regard the population problem as the chief problem with which the country is faced. Thus, Sir John Megaw, late Director-General, Indian Medical Service, made the following statement in 1933:—

"There is every reason to believe that the maximum increase which can be hoped for in the production of necessaries of life will not keep pace with the growth of the population, so that there is a prospect of steady deterioration in the state of nutrition of the people."

Carr Saunders, in his book "World Population" singles out India as the one country in the world in which "the situation which Malthus assumed to be more or less universal in time and space" still persists. We are not in sympathy with these views, since we are convinced that the needs of the growing population can be met by the intensive development of all resources. In this section on "ideas about population" we are simply drawing attention to trends of thought on the subject.

The future Growth of Population

9. According to the census figures, the population of India has increased by about ten or fifteen per cent in each of the last two decades, respectively. What course is the curve of population growth or decline likely to follow in the future? Apart from emigration and immigration, population growth depends on the relation between births and deaths, but neither the birth rate nor the death rate are constant factors. Other factors of importance are the age and sex composition of the population, and the fertility of women in the child-bearing period. In England and certain other European countries, previous to the war, the number of births exceeded the number of deaths and the population was slowly rising. But the application of new and ingenious methods of analysis to demographical data, largely devised by Kuczynski, showed that growth was likely to cease within a few years and be followed by a decline. The now well-known reasons for this conclusion are that the rapid fall in the birth rate during the last 50 or 60 years has led to an ageing of the population, so that the number of potential mothers of child-bearing age is becoming insufficient, at the existing rate of reproduction per woman, to maintain the growth of the population or to prevent its decline. Only women between the age of 15 and 50 can bear children, and birth rate per 1,000 of any given population is determined by the proportion of this age and sex group to the total population and the number of children born per woman.

10. Though decreasing, the death rate in India is still high. During the decade 1931–41, it averaged 23 per mile, a rate corresponding to that of Great Britain from 1860–70. In 1939 the latter was 12 per mille. When the death rate is high, the development of public health services may be expected to give large and rapid returns in the shape of a reduction in mortality; it is probably

easier to bring about a fall from 30 to 20 than from 15 to 12 per mille. Schemes are now being drawn up for extending and improving health and medical services which, if they come to fruition, are likely to produce immediate results. Modern medicine and public health have at their disposal numerous potent weapons for the prevention of disease and the saving of life.

Reference has been made in an earlier paragraph to the prevention of epidemic diseases. According to the 1941 census report, 500,000 fewer people died of cholera in the decade 1931–41 than in the previous decade. " In other words, half a million people were added to our 1941 population, who otherwise could have not lived into it. " The complete elimination of cholera is a perfectly feasible proposition. Plague is ceasing to be an important cause of death and could also be eradicated. Smallpox has declined less rapidly than cholera and plague and here there is great scope for reduction in mortality. Universal vaccination—one of the first objectives of an efficient health service—would have an appreciable effect on the death rate. But of all public health measures, a vigorous attack on malaria would probably save more lives than any other.

If the life of an elderly man or woman is saved and prolonged, the population is increased by one for a limited number of years. But a reduction in the mortality of younger people—e.g., of infants, children and women in the child-bearing period—affects not only existing numbers but also generations to come. The recent fall in the infantile mortality rate, as the Census Commissioner points out, added to the population during the decade 1931–41 three million children who would not have survived had the mortality rate of 1920 persisted. If infantile mortality continues to fall from 1941 to 1961 at the same rate as in the previous two decades, the number of lives saved and added to the population, on a similar assumption, would be over 13 millions. Similarly, a reduction in maternal mortality would have a considerable influence on population growth. At present the maternal mortality rate is high—perhaps 20 per thousand births. If this was lowered by half, which must be regarded as a by no means unattainable goal since the figure for England and Wales is 2·9, six millions would be added to the population in a decade. Not only this, but the children borne by women saved from death from anæmia, puerperal sepsis and other causes of maternal mortality would also swell the total population.

It has been pointed out that the high death rate among infants, children and women in the child-bearing period is to a considerable extent due to malnutrition. Special attention is now being given to plans for improving the nutrition of these " vulnerable groups. " The Bombay scheme whereby milk is distributed at half-price to expectant and nursing mothers and young children is an example. School feeding on a wide scale is strongly advocated. The effect of such measures must be to improve the health of the groups in question, increase their resistance to disease and

lower their death rate. Other things being equal, an increase in the rate of population growth must inevitably follow their adoption on an extensive scale.

11. *Fecundity* means the absolute capacity of women to bear children. "The full effect of feculity would be realized if all females throughout their entire child-bearing period had sexual intercourse with procreative men and did nothing to prevent conception and produce abortion".[1] The term *fertility* refers to the actual number of children born per woman of child-bearing age. In all countries, in fact, in almost any conceivable human circumstances, there must be a gap between fecundity and fertility. In England and certain other western countries, the wideness of the gap is due to the relatively large proportion of women who are unmarried, the late average age of marriage and the general use of contraceptive methods. In India these causes are scarcely operative, but fertility is relatively low for other reasons. Here we may quote Carr Saunders: "In India the average number of children born to a woman is not large. The census of 1931 gives the results of a special enquiry into 900,000 families scattered among all classes and in all parts of India. The conclusion derived from an analysis of the returns is that the average married woman in India has four[2] children born alive and that 2·9 in every four, 70 per cent, that is, survive. The relatively small number of children is not due to birth control or to postponement of marriage, since all women marry early. The explanation is in part that many women die before they reach the end of the reproductive period." The Census Commissioner (1931) remarked that "the families investigated were drawn from all grades of society and (except for the United Provinces) from every part of India, so that the resulting figures may be taken as a well-mixed sample, though admittedly inadequate numerically." Actually there is little doubt that the "sample" investigated was statistically unsatisfactory and was not, in fact, a true sample according to the statistical meaning of the term. It is noteworthy that in some of the occupational groups included in the enquiry the number of children per marriage was considerably above the over-all average of 4·2.

While we cannot accept the result of this enquiry as they stand, it may perhaps be true that "the average number of children born to a woman is not large." A high death rate among women during the reproductive period would of course tend to reduce the average fertility rate. But there may be other causes which lead to similar results. The reproductive faculty in living men and women may be impaired by malnutrition and disease. Reproduction is a physiological process and like all physiological processes is influenced by the general health of the body. For example, research has shown that certain types of dietary deficiency (e.g., deficiency of vitamin E) affect the functioning of the reproductive

[1] Kuczynski—The measurement of Population Growth 1930.

[2] Actually the figure given in the census report is 4·2.

organs in both males and females. In times of famine, as was pointed out in our first report, the birth rate is greatly reduced, largely, it seems, because of the actual physiological effect of food shortage on reproduction in its various aspects. It follows that an improvement in health and nutrition will, other things being equal, increase capacity to conceive and bear living children —will, in fact, tend to decrease the gap between fertility and fecundity. This is a point of some importance, which should not be overlooked in discussions of the population problem.

12. The age and sex composition of a population obviously affect its capacity for reproduction. In various western countries, the proportion of women of child-bearing age to the rest of the population is declining and this, if fertility remains constant, must lead to a decline in population. As far as India is concerned, there does not appear to be any immediate prospect of a similar trend influencing the curve of population growth. The following figures are taken from the Census Report of 1931:—

Proportion of females per 10,000 females at specific age periods for successive censuses.

Ages.	1931.	1921.	1911.	1901.
All ages.				
5– 9 ..	1,280	1,494	1,383	1,382
10–14 ..	1,124	1,081	997	1,082
15–19 ..	938	815	826	835
20–24 ..	985	881	930	892
25–29 ..	868	885	909	895
30–34 ..	756	833	835	851
35–39 ..	595	565	556	557
40–44 ..	505	621	631	652
45–49 ..	389	346	338	339

The Census Commissioner comments as follows:—

Taking the child-bearing period for a woman to be 15 to 40 the figures show at once that the 1931 census population was more favourable for growth than that of the three previous records. The difference is particularly noticeable in the first ten years of the reproductive span when fertility is greatest. Out of 10,000 women of all ages 1,923 were aged between 15 and 24, perhaps the most favourable of all for reproduction. The 1921 figure was 1,696, 1911 —1,756.

Unfortunately similar figures for 1941 are not available. The Census Commissioner (1941), however, draws attention to the fact that the proportion in the age group 5—9 in 1931 was definitely lower than in the three previous census years. This would mean a corresponding reduction in the age group 15—19 in 1941. He further makes the tentative suggestion that " in 1931 the reproductive position in India was more favourable than it had been in the past and may indeed have been at a peak." His guarded language is fully justified. There are not at present sufficient grounds for the conclusion that a reproductive " peak " occurred in 1931.

13. Knowledge of existing population, and estimates of future population, are of vital importance to governments in many spheres of state activity, and notably in connection with plans for reconstruction and development. It is particularly unfortunate that in the 1941 census, no age table was prepared, since such a

table is essential for the satisfactory forecasting of population growth. Belated efforts have been made to repair the loss by the appointment of a " Population Data Committee " to study a sample of one in fifty extracted from the returns during the census by the Census Commissioner. We learn that the Committee has met with difficulties in collecting this sample material and that for considerable areas it is no longer available. We hope, however, that it will be able to produce some valuable demographical data and throw light on future trends in population by the analysis of the available sample.

The future is always obscure. The most reasonable predictions about trends in human affairs are apt to be falsified by events. The Population Data Committee, in its first report, points out that " the population forecaster is not a prophet in the sense that he foretells what infallibly would come about. The correct view of his function is that he sets forth in exact and unequivocal form the state of our present knowledge and the tendencies deducible from it. He also says whither these tendencies are taking us but he does not say that they will continue to operate or whether we shall be landed at a particular destination. He says, in fact, to the people of the country: ' The present position is this—if the tendencies appearing from the present examination continue to have effect, or are not disturbed by major calamities or mass movements of population, the result will be of the following order.'

This is the correct scientific attitude. But as regards population growth in India, certain broad conclusions may justifiably be drawn, even if satisfactory scientific data are lacking. It seems clear that, in the absence of major calamities acting as " checks " in the Malthusian sense, the population will continue to grow at the present rate, or at an accelerated rate, for several decades to come. In giving evidence before us Professor Fisher[1] anticipated, with the same proviso, that the population would reach 500 millions in 20 or 25 years time. Age composition is favourable to growth. The possibilities of reducing mortality by the development of health and medical services are tremendous and plans are being laid to further such development. The present fall in the birth rate is important, but its significance cannot yet be assessed. If it is due to family separation, resulting from enlistment and the growth of war industries, it is likely to be followed by a compensatory rise when normal conditions return. A reduction in the number of babies affects the size of the female reproductive group, i.e., the " reproductive position " of any given population—only after a period of 15 or more years. The loss of life in the Bengal famine was considerable and will have some influence on the population of Bengal during the next few decades, but its immediate and after-effects on the total population of India may be dismissed as almost negligible.

14. In the next section we shall discuss the questions whether India is over-populated, and whether steps should or can be taken

[1] Professor R. A. Fisher, the well-known Statistician, who visited India early in 1945.

to check the growth of numbers or to bring about an absolute decline. Here we are simply drawing attention to the fact that *the existing set of circumstances* favour the continued growth of population, perhaps at a faster rate than at the present time. Those whose task it is to prepare plans for the future must keep this fact firmly in mind.

Is India overpopulated

15. This question has been answered in several ways. At one extreme there is the fanatical Malthusian who regards pressure of population as the basic cause of the poverty and malnutrition from which the country suffers, and anticipates that the continued increase of numbers will inevitably lead to catastrophe, since food production cannot possibly keep pace with it. At the other, there are those who hold that the growth of population is desirable and beneficial to the country, adding to its resources and man-power, and that with the satisfactory development of agriculture and industry India could easily support in comfort a much larger population.

16. Since 1880, the population has increased by 150 millions or thereabouts. The food resources of the country must have substantially increased during the same period, for, otherwise, the present population could not exist. But if, in 1880, total food supply in relation to the needs of the population was greater than at the present time, it follows that the growth of the population has been faster than that of food production. With regard to the question, we feel it of interest to refer to certain passages in the report of the 1880 Famine Commission. The first [1] of these concerns estimated requirements of foodgrains:

> One of these (questions under discussion) is the amount of food required by workers and non-workers. The conclusion we draw from a careful examination of the evidence of authorities in all parts of India is that, on an average, a ration of about 1½ lb. per diem of the meal or flour of the common coarser grain of the country suffices for an ordinary adult working male. In the rice-eating countries, an equal weight of rice may be accepted in lieu of flour, and in any case the ration should include a suitable proportion of pulse. A man doing light work would require about 1¼ lb.; and the ration which consists of 1 lb. of flour with a little pulse, has been found sufficient to support life in numerous relief houses, where no work is exacted, all over the country. On these bases the diet scale should be built up, it being understood that a female requires a little less than a male, a child below twelve years of age about half the allowance of an adult male, and a non-working child below six or seven about half as much as a working child.

The report includes a table giving data about the production of foodgrains in the various provinces, on which the following comment is made [2]:—

> The figures (though they are but approximate and rough estimates made from data which we hope soon to see more accurately established) indicate that the ordinary out-turn of food in British

[1] Indian Famine Commission, 1880—paragraph 184.

[2] Ibid—paragraph 156.

India exceeds 50 million tons, and the ordinary surplus for storage, for export, or for the luxurious consumption of the richer classes is more than 5 million tons.

The views of the 1880 Commission on population and food supply are worth quoting:—

> We can have no doubt that the surplus produce of India, taken as a whole, at present furnishes the means of meeting the demands of any part of the country likely to suffer from famine at any one time. It must, however, be observed that the present estimated yearly surplus would soon be all consumed by the increase of population which it is reasonable to anticipate in the future, unless the production should keep pace with the increase. The agricultural and trade statistics of the past 20 years justify the conclusion that the increased production of all sorts has up to the present time more than kept pace with the requirements of an increasing population, and the known large area of land which may still be brought under profitable cultivation, and the possibilities of securing increased production by means of improved agriculture and extended irrigation, afford reasonable grounds of confidence for the future. Fears, however, have been expressed that the grazing lands have already in many parts of the country been injuriously curtailed by being turned into arable land. If this be the case there will be no means of adding to the food supply otherwise than by introducing an improved agriculture which should yield a moderate increase in each acre already cultivated, and by bringing under the plough some of those vast tracts of uncultivated land which are fortunately still available; and eventually there must be pressing needs for such measures of improvement. The gradual movement of the surplus population where excessive, to these virgin tracts, would further assure the prospects of the future.[1]

It must be added that two members of the Commission, in a note of dissent, found themselves "unable to place confidence . . . in the approximate and rough estimates . . ." which showed an annual surplus yield of five million tons of foodgrains, and were less optimistic about the food situation generally. They pointed out that "population is increasing, the price of food is rising, the production of it as shown by exports scarcely advances, whilst, as the number of the landless class who depend on wages is constantly growing, the supply of labour in the absence of industries other than agriculture must soon exceed the demand."

17. The standard of cereal requirements which was accepted by the 1880 Commission as the result of "careful examination" was higher than the present standard of one pound per adult, on which calculations of requirements and rationing schemes are based. This suggests that the general level of consumption 60 years ago was higher than at the present time. With regard to the total supply position, while the dissenting members refused to accept the estimate of a surplus of five million tons, there was undoubtedly a very considerable surplus in normal years. Further the Commission was able to refer to "the vast tracts of uncultivated land which are fortunately still available." Since

[1] Indian Famine Commission, 1880—paragraph 157.

1880 a large part of this land has been brought under cultivation. While there are still considerable areas of waste land which might be cultivated, the scope for such development is obviously smaller in 1945 than it was in 1880.

We find it difficult to avoid the conclusion that in 1880 the whole food situation was *in certain respects* more favourable than the situation with which we are faced to-day. There is, however, no fully satisfactory evidence available that standards of nutrition have fallen during recent decades. Increasing under-nutrition would tend to raise the death rate, but the death rate has fallen. It may of course be argued that any effects on the death rate of increasing under-nutrition have been offset by public health measures against epidemics, the development of maternity and child-welfare services, the improvement in the treatment of hospital patients, etc. The possibility may also be mentioned that average height and weight have fallen as a result of deterioration in diet, i.e., that there has been a process of physical adaptation to a decreasing *per capita* food supply. Whether there has been deterioration or improvement, the important fact is that existing standards of nutrition are thoroughly unsatisfactory. The population is indeed being fed, but fed at a low level. Under-nutrition and malnutrition are widespread.

18. In relation to the existing stage of development of her industrial and agricultural resources, India is, in our opinion, overpopulated. Pressure of population, which of course varies in intensity in different parts of the country, is shown and felt in various ways; by the general trend of food imports and exports, India having within a generation become an importing rather than an exporting country; by the decrease in the size of holdings, the fragmentation of holdings, and the increase in the number of landless labourers [1], all related to the fact that the total area under cultivation has not increased as rapidly as the population, so that the *per capita* area has decreased; by the continuing poverty of the mass of the people and by the widespread existence of mal- and under-nutrition, in spite of growth in total industrial and agricultural resources and in the total wealth of the country. The existing situation emphasizes the need for developing the resources of the country rapidly and to the fullest possible extent.

There is one cheerful lesson which may be drawn from a study of the 1880 report. The Commission was concerned with the

[1] In the 1921 census returns, the proportion of the categories "Farm servants plus field labourers" to "ordinary cultivators" was 291 to 1,000. The Census Commissioner of 1931, in attempting to compare the position in 1931 and 1921, remarks that "probably the fairest comparison would be to take the 1931 figures of cultivating owners and tenant-cultivators, both principal and dependent, and to compare them with the number of those only who returned agricultural labour as their principal occupation, in which case the resulting ratio is 407 agricultural labourers to every 1,000 cultivators. In any case, the change in ratio is somewhat remarkable, even when adopting the lowest ratio which can be compared with that of 1921. Possibly, the explanation is that a large increase has taken place in the agricultural population without a corresponding increase in actual holders of land, whether as tenants or owners, though it is likely that a concentration of land in the hands of non-cultivating owners is also taking place."

growth of population in relation to food supply, as we are to-day. They would probably have found it difficult to envisage the possibility that the country would be capable in 1945 of supporting a population of 400 millions, 150 millions more than in 1880, at any level of consumption. Yet this has actually happened. As a result of achievements in irrigation and the extension of cultivation nearly 400 millions are now being fed on food produced within the country, supplemented to a relatively small extent by imports, at a level of consumption which has hitherto been compatible with a fall in the death rate. Food production has at least to this extent kept pace with population growth. Similarly the prospect that the population will increase by a further 100 millions during the next 25 years may at the present time appear to make formidable demands in the sphere of food production, particularly in view of the fact that certain potentialities for increase which existed in 1880 no longer exist to-day. On the other hand, agricultural science has developed enormously in the intervening period and has opened up great possibilities for increasing food production. A primary difference between 1880 and 1945 is that we have to-day at our disposal new knowledge and new methods created by the advance of science.

THE FUTURE OUTLOOK

19. We shall in other sections of our report discuss the various possibilities of increasing food production. Here we may draw attention to certain broad trends in the approach to this problem. The Famine Commission of 1880 laid particular stress on the development of communications, notably railways, in order to ensure that food could be transported into famine areas and to open up new areas for cultivation. It also strongly recommended the development of irrigation in suitable localities. It was fully aware of the need for improving the practice of agriculture and the economic position of the agriculturist, and had much to say about indebtedness. It drew attention to the need for developing industries. It recommended the establishment of agricultural departments, but it was not until much later that such departments, in the modern sense, came into existence.

During the last two decades of the nineteenth century many new irrigation works were constructed. The Famine Commission of 1898 reviewed the progress that had been made and remarked that "among the means that may be adopted for giving India direct protection from famine arising from drought, the first place must unquestionably be assigned to works of irrigation." This Commission paid relatively little attention to other measures for increasing food supply. An Irrigation Commission was appointed in 1903 to further the development of irrigation.

The Famine Commission of 1901, which initiated the co-operative credit movement, struck a new note in considering methods of increasing food supply. To this Commission, as the Royal Commission on Agriculture pointed out, "we owe the development of agricultural departments working on scientific

lines for the improvement of agriculture." During the nineties agricultural experts were employed by the Government of India to survey agricultural conditions, but no facilities existed for systematic research and its practical application. It was not until 1905 that steps were taken to further these ends. In that year " the Government of India announced their intention of setting aside annually a sum of Rs. 20 lakhs which was subsequently increased to Rs. 24 lakhs, for the development of agricultural research, experiment, demonstration and education in the provinces. The aim which the Government set before themselves was the establishment of agricultural colleges with a course of three years' duration in all the provinces and provision of an expert staff for these institutions for purposes of research. The link between the colleges and the districts was to be provided by experimental farms in charge of officers whose duty it would be to keep in close touch with the cultivators and advise them in regard to improved methods of agriculture ".[1] At the same time, provincial departments of agriculture were established more or less in accordance with the system of organization which exists at the present time.

We are not concerned here with the success or failure of the organizations for the improvement of agriculture initiated forty years ago. We are drawing attention to a certain change in the approach to the problem of increasing food supply which has taken place since the first Famine Commission presented its report in 1880. At that date the main emphasis was perhaps on the need for bringing waste land under cultivation. There is still room for extending cultivation in uncultivated areas, but in the main we must now look to an increase in the productivity of land already under cultivation as the means of meeting the food requirements of the growing population. Although irrigation in all its forms is still of primary importance in increasing yields, other methods of raising outturn, such as, manuring, improved varieties of seed and protection against pests and diseases have steadily gained in prominence. The Royal Commission on Agriculture considered them in detail, and brought into being the Imperial Council of Agricultural Research which has done much to further the development of agriculture and animal husbandry along scientific lines.

20. It is difficult to assess the general trend of yields in the country as a whole at the present time. In the case of certain crops, notably sugarcane, there has been a remarkable increase in average yields, but the position as regards cereals is less clear. Probably progress has been achieved in certain parts of the country, and large cultivators in general, with resources at their disposal, have improved the productivity of their lands. But it is very questionable whether the bulk of small cultivators in many areas have as yet been able to achieve anything in this direction, and statistics from various provinces indeed suggest that average cereal yields

[1] The Royal Commission on Agriculture, page 33.

have been decreasing. We regret the lack of satisfactory information on this point, since it has a bearing on future possibilities. The question of potential increase in yields has been discussed by Dr. Burns, who served for some years as Agricultural Commissioner with the Government of India, in his monograph on "Technological Possibilities of Agricultural Development in India (1944)". According to this authority, yields of rice could be "increased by 30 per cent, 5 per cent by using improved varieties, 20 per cent by increasing manure, 5 per cent by protecting from pests and diseases. There should even be no difficulty in increasing the present average outturn by 50 per cent, viz., 10 per cent by variety and 40 per cent by manuring." Potential increases in the yield of wheat and millets, according to this authority, are of the order of 30 per cent; for cow and buffalo milk, 75 and 60 per cent respectively. The present average yield of sugarcane is about 15 tons per acre. Dr. Burns thinks it possible to produce yields of 30 to 55 tons per acre according to the part of India. These are *technological* possibilities, illustrating what might be achieved by the application of thoroughly efficient agricultural methods. They are not immediate practical possibilities for the small producers, without capital or education, who form the bulk of Indian agriculturists. But the fact that, by the reorganization of agriculture and agricultural methods, yields can be very substantially increased, influences the whole future outlook. We believe that it is possible, by a variety of means, notably by increasing water supply and by improved farming in the widest sense of the term, to produce not only enough food to meet the needs of the growing population at subsistence level but enough to effect an improvement in the diet of the people. But the magnitude of the task involved and its imperious necessity, must be strongly emphasised. Either an effort must be made on a scale hitherto unthought of, or a decline in standards of living and nutrition is inevitable.

CHECKING THE GROWTH OF POPULATION

21. It is impossible to forecast what will actually be accomplished during the next few decades in increasing food production. But whatever success is achieved, the population cannot continue to increase indefinitely, for even the developments in food production envisaged as possible by Dr. Burns have their limits. Ultimately a decrease in the rate of population growth is not only desirable but necessary. What are the possibilities that stabilization will occur? During the next 25 years or thereabouts continued growth must be expected. A figure of five hundred millions in 1970 or thereabouts is to be anticipated. The essential point is whether, when that figure is reached, the whole "reproductive situation," including the relation between the birth rate and the death rate, is favourable to continued growth at an equal or accelerated rate, or whether the population has reached, or is approaching, a position of stability.

The trend towards a reduction in the birth rate observable in the last three years would, if it continues, strongly influence the

future course of population growth. At present its underlying causes are not fully understood and we consider it essential that they should be scientifically investigated. Professor R. A. Fisher has suggested to us that this can be done by the methods of sample surveys. We recommend that an enquiry should be undertaken immediately, under the guidance of statistical experts. As we point out elsewhere in our report, rapid industrial development is necessary in India to relieve pressure on land and increase national wealth. The relation between the apparent fall in the birth rate in 1942 and 1943 and the recent growth of industry and the employment of labour for war purposes is therefore a question of interest and importance.

EMIGRATION

22. One way of reducing numbers is by emigration. During the second half of the nineteenth century and the first thirteen years of the twentieth century emigration and immigration had an important influence on population in various countries of the world. Immigrants from Europe helped to swell the population of North America and British Dominions; for example, Carr Saunders points out that "the actual rate of increase of the population of Italy was kept down to a low figure between 1900 and 1913 because emigration (to the United States) was on so large a scale; in fact in 1905, 1906, 1907 and 1913 the net loss by emigration exceeded the natural increase." In Asia the Chinese have emigrated in considerable numbers to such countries as Java and Malaya. Emigration of Indians to Burma, Malaya, Ceylon, Africa, etc., has also taken place. It is to be observed, however, that emigration from India has been negligible in relation to the size of the population. In 1931 it was calculated that about 2¼ million Indians were living overseas, a number about equal to two-thirds of the average annnal increase between 1921 and 1931.

Conditions as regards emigration after the war cannot be foreseen and we are not at present justified in depending on emigration to places abroad as a means of influencing population growth. There is, however, one aspect of the matter to which we would draw attention. Within the Commonwealth and the Empire there are regions which are sparsely populated and need additional population for their development. The emigration of Indians to these regions would serve a double purpose; it would relieve to some extent the pressure of population on the land in India, and would facilitate the development of those regions. The war has emphasized the need for mutual assistance amongst all peoples within the Commonwealth and the Empire and we look forward to the day not only when India will be a self-governing and equal partner in the Commonwealth, but also when her sons, who have fought beside other peoples of the Commonwealth and Empire in the cause of freedom in the present war, and their descendants, will be able to emigrate as colonists, entitled to the full rights of citizenship, to these sparsely populated areas.

The internal movement of population is briefly referred to in Section C of Chapter II of Part IV. While such movement does not affect total numbers it can relieve population pressure in congested areas. Its future importance in connection with population and food supply depends on the opportunities for employment provided by the growth of industry, and for colonisation created by the development of agricultural areas which are now thinly populated and under-cultivated, but could be opened up by the extension of irrigation, tractor ploughing, anti-malarial measures, etc. This is only another way of saying that the general development of resources will faciliate the re-distribution of population and relieve the present situation.

URBANIZATION

23. There are two ways in which the development of industry may affect population growth. The first is a crude one. At the present time in India unskilled workers from rural areas are being employed in large numbers in war industries and on military projects. The latter, e.g., the construction of roads and aerodromes, are not strictly speaking industries, but they attract rural labour in the same way as factories engaged in war production. Employment is often of a temporary nature and for a number of reasons male workers are often unaccompanied by their families. The movement of workers to large centres at which mass employment is available is obviously inimical to family life and reproduction, influencing the birth rate either by postponement of marriage or by preventing the cohabitation of those already married. The enlistment of large numbers of young men in the army has approximately the same effect. The development of existing industries and the creation of new industries in peace time may influence family life in a similar manner, but presumably to a smaller extent than war-time industrialization and employment and war conditions generally.

The growth of industry under normal conditions affects population growth because it increases *urbanization*. "Within all communities", Enid Charles remarks, "we generally find a different level of fertility in rural and urban areas."[1] In other words, people living in cities have fewer children than people living in the country. It would be outside the scope of this report to consider in detail the complex factors which produce this result. Conditions of family life, the employment of married women, housing, the relatively high percentage in cities of middle-class families with strong economic motives towards family limitation, the availability of contraceptives—all these and others play a part. The declining birth-rate in the West has been associated with increasing urbanization. We need not consider here the question whether the reduction in the birth-rate due to urbanization is a good or bad thing; actually many of the social forces concerned are evil. We are simply drawing attention to a fact which has

[1] The Twilight of Parenthood, 1934.

a bearing on population growth. The population of large cities in India increased by 9 millions during the decade 1931–41 and there is every indication that this process will continue, probably at a faster rate. It is reasonable to suppose that urbanization and industrialization will have the same effect on reproduction in India as they have had in other countries of the world.

Urban areas in India are at present most unhealthy, with a higher death-rate than rural areas. In 1938, the recorded rural and urban infantile mortality rates were 164 and 191 per mille respectively, while in Calcutta, Bombay and Madras, the rates respectively were 219, 268 and 222. While the registration of deaths may be more complete in cities than in rural areas, there is no doubt that health conditions are seen at their worst among the urban poor, and that such conditions are inimical to infant survival. If industry develops rapidly without proper steps being taken to safeguard the health of the workers, a high death rate among such workers and their families is to be expected. It is, of course, essential that the living conditions of the growing industrial population should be satisfactory and that there should be adequate health services in industrial areas. We refer here to the existing high death-rate in urban areas as a factor which might have some bearing on population growth should industry develop rapidly on a wide scale without sufficient attention being paid to the health of industrial workers.

Family Limitation

24. There can be no doubt that the fall in the birth-rate in the West has been brought about largely by the use of contraceptive devices, or, to use the popular expression, by birth control. The evidence on this point is quite convincing. This is not to say that the spread of knowledge about contraception and the availability of contraceptive devices have been the *cause* of the fall; the issue is deeper than that. Rather they were the means whereby social forces strongly in favour of small families were able to operate effectively. The mere availability of contraceptives and the dissemination of knowledge on the subject will, of course, of themselves influence the attitude of a people towards birth control. But it is important to realize that the fall in the birth-rate which has taken place in western countries is the result of the interplay of many social, economic and psychological factors. The reproduction of a community is determined by the whole manner of life of the community. In this country, the social environment which has encouraged and facilitated birth control in the West, does not exist as far as the bulk of the population is concerned. There is little doubt, however, that the practice of family limitation has appeared and is spreading amongst the well-to-do classes. Facts about differential fertility in various economic strata are urgently required, but here again the unfortunate decision of the Government of India to restrict to a minimum the tabulation of the 1941 census data had the result that vitally important information is unavailable. In the absence of any recent data about

differential fertility, we are reduced to quoting the following familiar figures from the 1931 census report:—

Average number of children per family born alive.

Pasture and agriculture	4·3
Law, medicine and instruction ...	3·7

We may also quote an interesting passage from the evidence given by the Director of Public Health, Madras, to the Royal Commission on Agriculture in 1927.

"I examined the birth-rate figures for Madras city in 1924 and 1925, and to my amazement found that the birth-rate among the Brahmins of the city was practically equal to the birth-rate among the Europeans. The birth-rate of other communities gradually rises as one goes down the social scale until you get to the lowest class of all, when it is practically double the Brahmin birth-rate."

We realize that existing information about differential fertility is totally inadequate. All we can say is that there are signs that among the upper and professional classes generally the birth-rate is falling. In western countries the birth-rate first declined among the well-to-do; later, decline became evident among lower income groups, spreading downward through the social strata. The significant fact is that the first beginnings of the process, which in its fully developed stages has strongly influenced the curve of population growth in the West, are discernible in India. The upper and middle classes are, however, at present only a tiny fraction of the total population and any change in the birth-rate of these classes can have little immediate effect on population growth.

25. In our questionnaire, which was circulated to Provincial Governments and to a number of private individuals, the following question was included:—

"Having regard to the present size of the population of your province and its potential growth, and having regard also to the present and potential resources of your province, are you convinced that measures should now be taken for securing a limitation of the rate of increase of the population? If so, state and discuss the measures you would recommend for this purpose."

A number of replies to this question, both from governments and individuals, and expressing different points of view, are included in Appendix I. We do not know whether in every instance the statements made by government spokesmen represent the considered attitude of the governments concerned towards this question. The replies are, however, interesting and instructive and illustrate the present stage of public opinion with regard to the issue of family limitation. To some extent the attitude of government spokesmen reflects the density of population and the present food situation in the province concerned. Sind admits no population problem; the North-west Frontier Province advises us to keep

away from the subject altogether; the Central Provinces and Berar, a surplus province with a relatively low population density, is not seriously worried. In Bihar, on the other hand, population pressure appears to be making itself acutely felt. In many of the statements the desirability of family limitation is recognized, but emphasis is laid on the great difficulty of encouraging the practice of birth control at the present time, both for religious reasons and because of the low economic condition of the people. The effect of postponement of the age of marriage in reducing population growth is referred to in several of the replies. Finally, we may draw attention to the view, expressed in various replies that a rise in the standard of living is an essential preliminary to family limitation, as far as the mass of the population is concerned.

Final Observations

26. We have discussed the population problem at some length because of its close bearing on our terms of reference. In our previous report on the Bengal famine we included among the causes of the famine the fact that agricultural production has not kept pace with population growth in Bengal. We now propose to recapitulate the main facts as we see them and add some concluding remarks.

Considerable areas in India are at present overpopulated, the effect of excessive pressure being shown in various ways. The population is likely to increase to 500 millions in 25 years, unless some major calamity intervenes. Sooner or later a decrease in the rate of population growth must occur, and we believe that the sooner this occurs the better. As far as the immediate future is concerned, population growth imposes the stern necessity of increasing food supply by all available means. To provide enough food for all, all the resources of science and technology must be used to increase yields from land already under cultivation and to bring under cultivation all land capable of yielding satisfactory returns. Because of the existence of these resources, we hold the view that the population situation, as we have described it, is compatible with general improvement in standards of nutrition.

With regard to family limitation, the middle classes have already begun to reduce their families from prudential motives. We would lay strong emphasis on the fact that a rise in the standard of living is the primary means of checking the rate of population growth. All experience in other countries supports this conclusion. In India, as elsewhere, a fall in the birth-rate will tend to follow rather than precede economic betterment. At the present time, in our opinion, a deliberate state policy with the objective of encouraging the practice of birth-control among the mass of the population (e.g., by the free distribution of contraceptive devices) is impracticable. For religious reasons, public opinion is not prepared to accept such a policy; some of the statements quoted in appendix I provide evidence on this point. Further, the low economic condition of the poorer

classes and their lack of education, together with the factor of expense, seem to make the widespread encouragement of birth-control a practical impossibility.

The postponement of the age of marriage tends to lower the birth-rate, not only because it reduces the effective child bearing period, but also because women are most fertile in their earlier years. Here the Census Report may be quoted; " We have no figures for India showing the differential fertility rates by age period, but figures from all countries bear it out that the earlier years and 15–25 particularly are markedly more fertile than the later ones in the reproductive span." It is well known that in Ireland, a largely Roman Catholic country in which contraception is frowned on by the Church, the growth of population has been held in check by the remarkably late average age of marriage. The average age of marriage appears to be rising in India, at any rate among certain classes, but no satisfactory data on this point are available. Many social and other factors influence the age at which marriage takes place for women. We recommend a careful study of the whole question. Postponement of marriage may have a most important influence on the trend of population growth in India. It may be added that the reproduction of a human community is profoundly affected by the status of women in that community. Experience in other countries suggests that feminine advancement in general is likely to be associated with a falling birth-rate. We cannot discuss this complicated question in detail. In referring to it we would call attention once again to the depth of the whole problem of population growth and its far-reaching human and social implications.

27. We have pointed out in a previous section that the development of public health would appear likely to accelerate population growth, e.g., by its effect on infant and maternal mortality. In this connexion we may draw attention to certain important points. In the first place the fear that improvement in public health may lead to over-population should on no account be allowed to interfere with progress in this sphere. We may quote here a passage from the Census Report of 1931. " It would appear, in view of the present rate of increase, that efforts to reduce the rate of infantile mortality should be preceded by precautions to reduce the birth-rate, and if the luxury of ' Baby Weeks ' be permitted they should at least be accompanied by instruction on birth-control." Given the fact that the country is over-populated, the statement may at first sight appear to be a reasonable one, even though the description of ' Baby Weeks ' as a luxury, with the infantile mortality rate at its present figure, has a somewhat inhuman sound. Again, Carr Saunders,[1] while emphasising the need for better health services, remarks that such progress "might tend merely to increase malnutrition and the danger of starvation " by increasing the rate of population growth. Such sentiments, however expressed, convey the

[1] World population, 1936.

suggestion that a vigorous public health policy might do more harm than good, and are in our view misguided. There are grounds for supposing that public health development may *in the long run* have effects on population growth other than the obvious one of swelling numbers by the addition of those who have been saved from death.

Our attention was drawn by Professor Fisher to an important relationship between the birth-rate and the death-rate, which was observed and studied in England early in the present century. This may be described in simple terms as follows: If the life of infants and children is precarious, parents tend to "over-compensate" by having more children. It was found that there was a correlation between a high death-rate among first children in infancy and the size of the family. Professor Fisher remarked to us that "parents who have suffered losses and disappointment are more desirous of replacement than parents who have not been affected in this way, and I am quite sure that a large part of the fall in the birth-rate in Europe and in America is the psychological consequence of the fall in the infantile death-rate". We do not know how far this hypothesis is generally accepted, but it seems plausible. It is probably true that in India the urge to "insure" against the loss of male children by producing a large family is particularly strong. It has been suggested to us that a serious assault on infantile mortality would, for the reasons given above, have a potent influence on the birth-rate. We feel that this question, inadequately and briefly discussed here, deserves the close attention of students of population in India. It provides an apt illustration of the subtlety of population problems, and of the fact that public health development may affect the birth-rate in an unexpected manner.

Measures to improve the health of the people are an essential part of the effort to raise the standard of living. Only a healthy people will have the energy necessary for progress. To give an obvious example, the eradication of malaria would, as we point out in Chapter VI of Part III immediately ameliorate economic conditions in malarious areas, since the population, now weak and anaemic as a result of the disease, would have more stamina and initiative and greater capacity for work. As we have said, a rise in the standard of living is the most important factor in decreasing population growth.

28. A high birth-rate accompanied by a high death-rate means *waste* of human effort and lives, since many children brought into the world fail to reach maturity. The very high death-rate among infants, and children up to 10 years of age, has previously been referred to. Similarly there is much ill-health and mortality among women in the child-bearing period—equally a wasteful process from the standpoint of the community—which could be prevented by better maternal care, and the avoidance of a rapid succession of pregnancies by the "spacing" of births This is an aspect of the question under discussion on which emphasis must be laid.

Health education is a necessary part of public health development. It involves training in hygiene and elementary physiology, and tends indirectly to pave the way towards family limitation. We have said that we are not in favour of an out-spoken state policy "with the objective of disseminating knowledge of birth-control among the poor and encouraging its practice", and have given reasons for this view. There is, however, no reason why the state should not take other steps, through the medium of health services, which will have the effect of encouraging family limitation. Knowledge of birth-control could be imparted through maternity and child welfare centres, by women doctors, to women whose health would be endangered by further or excessive child-bearing, and also to women who seek advice because of a reasonable desire to "space" their children. The satisfactory "spacing" of children, to ensure that each child will be borne healthy and can receive adequate maternal attention, is a legitimate and desirable public health objective. If sound advice given by qualified doctors is unavailable, advertisers who offer for sale injurious and ineffective contraceptives may reap a rich harvest. We are, of course, aware of the fact that the number of women doctors is at present hopelessly inadequate, but this state of affairs can be remedied. The development of health services, the general purpose of which is the care of women in the child-bearing period, will in our opinion help to spread knowledge and practice of birth-control in the most desirable manner, without any overt clash with public opinion. In view of the present grave risks of maternity, the need for such services cannot be over-emphasised. In this case also public health progress may *in the long run* have a tendency to stabilize population.

29. In considering population in its various aspects, we have been struck by the insufficiency of existing knowledge and we venture to hope that any defects and omissions in our survey will be excused on this score. The need for the collection of more complete and accurate demographical data is clear; such knowledge is vitally necessary to a modern government which is concerned with state planning and the orderly development of the country's resources. The decennial census is a great administrative achievement which has produced data of essential importance, but the investigation of population trends and population problems generally every ten years is not sufficient. The growth of population, with all that it involves, is a continuing process. We consider it essential that an organization should be set up for the collection of demographical information year by year and its scientific study. We recommend the appointment of a Registrar-General to the Government of India with a suitable staff at the centre, whose task will be to improve methods of registering births, deaths, etc., and to study and interpret figures of greater accuracy than those at present available. Similar officers will be required in the provinces, working in touch with the Registrar-General. Registration is of primary public health importance and data about births and deaths are collected through the medium

of public health services. Registrars in the Central Government and in the Provinces would naturally work in close association with public health authorities. In view, however, of the importance of the population problem, we conceive the task of the Registrar-General, and of Registrars in the provinces, as having a significance outside the field of public health. *Ad hoc* enquiries on questions of primary importance, e.g., differential fertility, could be initiated by the Registrar-General. He and his organization could play a prominent part in the taking of the decennial censuses and arrange for the collection of special data and the investigation of special problems at the time of the census. We may add that demographical problems offer a field of absorbing interest for scientific investigation. We visualize the possibility of a group of keen young statisticans, associated with the Registrar-General, undertaking the detailed study of some of the many questions referred to in this chapter and others of equal importance. This would help to replace expressions of opinion by clear and convincing scientific facts and stimulate the interest of administrators and the educated public in a subject which, in India as in all countries, has a close bearing on long-term plans of development.

SUMMARY

30. (i) The population of India has increased by about 30 per cent since 1872 and is now in the neighbourhood of 400 millions. The rate of increase has not been as rapid as in certain other countries. There is a general tendency for the excess of births over deaths to increase and great possibilities exist for further reduction in the death rate by the development of public health services.

(ii) The reported net area under food crops *per capita* is about 0·72 acre. It appears that during the last 30–40 years the area under cultivation *per capita* has decreased. American experts have calculated that 1·2 acres *per capita* are required to produce an "emergency restricted diet" in United States of America.

(iii) During the decade 1931 to 1941 the population of large cities increased more rapidly than the population as a whole. During the same decade, however, the non-urban population increased from 300 to 339 millions and its percentage to the total fell only from 88·9 to 87·2. Whatever the future prospects of industrial development, India is at the present time essentially a country of agriculturists.

(iv) Analysis of the various factors concerned with population growth suggests that, in the absence of major calamities, the population will reach 500 millions in 20 or 25 years time.

(v) The food position in relation to population appears to be in certain respects less favourable than in 1880. There is, however, no fully satisfactory evidence that standards of nutrition have declined since that date. India, in relation to the existing

stage of her industrial and economic development, is over-populated, increasing pressure of population manifesting itself in various ways. On the other hand, the advance of science has opened up possibilities of increasing food production which did not exist 60 years ago.

(vi) Whatever success in increasing food production can be achieved, ultimately a decrease in the rate of population growth is not only desirable but necessary. While an addition of a further 100 millions to the population within the next 25 years must be anticipated, the essential point is whether, when that figure is reached, the whole "reproductive situation," including the relation between the birth-rate and the death-rate, is favourable to continued growth at an equal or accelerated rate, or whether the population has reached, or is approaching, a position of stability.

(vii) The course of population growth may be influenced by emigration, urbanization and family limitation. Emigration abroad has hitherto had little influence on population in India. It is, however, pointed out that the emigration of Indians as colonists to sparsely populated regions in the Commonwealth and the Empire, would serve the double purpose of relieving to some extent the pressure of population on land in India, and of facilitating the development of such regions.

(viii) Experience in other countries indicates that urbanization is, for various reasons, associated with the slackening of population growth, and increasing urbanization in India may have a similar effect.

(ix) There is evidence that the practice of family limitation has appeared in India, but it is as yet confined to the more prosperous classes. At the present time a deliberate state policy with the objective of encouraging the practice of birth control among the mass of the population is impracticable, both because of public opinion on this matter and because of the low economic condition of the poorer classes and their lack of education. A fall in the birth-rate will tend to follow rather than precede economic betterment.

(x) Development of public health services may *in the long run* have a tendency to stabilise population. A high birth-rate accompanied by a high death-rate means waste of human effort and lives. It is suggested that an assault on infant mortality would *ultimately* tend to reduce the birth-rate. The state can legitimately take steps, through the medium of health services, which will have the effect of encouraging family limitation. Knowledge of birth-control could be imparted through maternity and child welfare centres, by women doctors, to women whose health would be endangered by further or excessive child-bearing, and also to women who seek advice because of reasonable desire to "space" their children.

(xi) The appointment of a Registrar-General to the Government of India, and Registrars in the Provinces, is recommended.

Among their tasks would be the improvement of the registration of deaths and births, and the collection and scientific study of demographical data of various kinds.

(xii) While the fact that there is a serious population situation must be recognized, the primary problem is that of under-development of resources, both agricultural and industrial. The belief is expressed that it is possible, by a variety of means, to produce not only enough food to meet the needs of the growing population at subsistence level, but enough to effect an improvement in the diet of the people. The magnitude of the task involved, and its imperious necessity, are, however, strongly emphasised.

CHAPTER II.—THE PROBLEM OF NUTRITION

Our terms of reference include " the possibility of improving the diet of the people." Previous Famine Commissions were concerned with the prevention of famine, i.e., with ensuring that food supply was sufficient in quantity. At the date of the last Commission—1901—the science of nutrition had scarcely passed the embryonic stage and modern ideas about the importance of the *kind* of foods consumed by human beings had not been conceived. It was generally believed that if an individual had enough to eat, of any kind of food, his nutritional condition was satisfactory. Since the beginning of the century, however, there have been remarkable developments in nutritional science and it is now known that a diet may be sufficient in quantity but at the same time unsatisfactory in quality. A human being needs not only enough food (calories); he needs also, if his diet is to be adequate for health, enough proteins, vitamins and mineral elements. The bearing on human affairs of the modern science of nutrition was summed up as follows by the United Nations Conference on Food and Agriculture, held in the United States of America in 1943:—

(1) The kind of diet which man requires for health has been established.

(2) Investigations in many parts of the world have shown that the diets consumed by the greater part of mankind are nutritionally unsatisfactory.

(3) Diets which do not conform with the principles of satisfactory nutrition lead to impaired physical development, ill-health and untimely death.

(4) Through diet a new level of health can be attained, enabling mankind to develop inherited capacities to the fullest extent.

Dietary Standards

2. We may briefly discuss, with reference to India, these four propositions. Standards of satisfactory nutrition have been drawn up by various authoritative bodies, such as the Technical Commission on Nutrition of the League of Nations. In India a standard has been put forward by the Nutrition Advisory Committee of the Indian Research Fund Association. In approaching this question, nutrition workers proceed in the following way: First, human requirements of the various food factors necessary for health are worked out on a scientific basis, the records of experiments and observations made by scientific workers all over the world being available for this purpose. It is agreed that a child or an adult requires so much protein, so much vitamin A, so much vitamin C, so much calcium and so on. The quantities of these and other nutrients or food factors contained in common foods are known, again as a result of investigations in many laboratories. The next step is to translate requirements in terms of nutrients into terms of common foods, which can be done in numerous different ways. The Nutrition Advisory Committee has drawn up the following

balanced diet, in terms of Indian dietary habits, which will provide the various nutrients in quantities sufficient for the daily needs of an adult man :—

COMPOSITION OF A BALANCED DIET

(Adequate for the maintenance of good health.)

	Oz.		Oz.
Cereals	14	Milk	10
Pulses	3	Sugar and jaggery ..	2
Green leafy vegetables..	4	Vegetable oil, ghee, etc.	2
Root vegetables ..	3	Fish and meat	3
Other vegetables ..	3		No.
Fruits	3	Eggs	1

PROTECTIVE FOODS

3. The term " protective foods," coined some years ago by Professor McCollum of John's Hopkins University, is now familiar to the educated public. We can summarize modern ideas about dietary requirements by saying that human diets must contain protective foods in sufficient quantities. A diet largely composed of cereals does not contain enough of the nutrients required for health and needs to be supplemented by other foods to make good its deficiencies in respect of proteins, fat, vitamins and mineral salts. These include milk and milk products, meat, fish, eggs, pulses, vegetables and fruits. In brief, the problem of improving the diet of the people and the problem of providing more protective foods are identical, or very nearly so. The conception of protective foods is a simple one and appeals to the public mind, but underlying it there is a solid scientific foundation.

THE PRESENT POSITION IN INDIA

4. To what extent does the population suffer from under- and malnutrition? There is a distinction between these terms. " In the strict sense under-nutrition means insufficient food, while malnutrition implies the wrong sort of food. It is clear, however, that an under-nourished individual will almost invariably be mal-nourished also, since he will not obtain enough of the various food constituents needed for health. On the other hand, an ill-balanced diet may be sufficient in quantity and yet lead to malnutrition because of its qualitative defects. In practice under-nutrition and malnutrition usually co-exist and the term malnutrition is often used with reference to general inadequacy of the diet in both the quantitative and qualitative sense."[1]

A large proportion of the population consumes a diet which fails to conform with the standards put forward by nutrition workers, i.e., which does not contain protective foods in sufficient amounts. Among the poor sections of the community, both urban and rural, there is much under-nutrition as well as malnutrition. We shall not attempt to assess the proportion of the population which, in normal times, does not get enough to eat; it has been estimated by certain authorities at 30 per cent. Light has been

1. Nutrition Advisory Committee, Indian Research Fund Association, March 1944.

thrown on the nature of the diets consumed in various parts of India, and their adequacy or otherwise in the quantitative and qualitative sense, by a series of diet surveys carried out within recent years by nutrition research workers. Here we shall quote once more from the Nutrition Advisory Committee:

Some 100 surveys have already been carried out. In a typical survey a quantitative investigation is made of all the foods consumed by a simple group of 15–30 families in a given area for a period of 10–30 days. Intake of the various foods per adult man or consumption unit is worked out and the composition of the diet in terms of food factors, i.e., protein, mineral salts, vitamins, etc., is calculated. Surveys have sometimes been repeated on the same area at different seasons. It is to be observed that while there is inevitably a considerable margin of error in diet surveys, because of the circumstances in which they are made and for numerous other reasons, they provide the most satisfactory means of obtaining a true picture of dietary habits and information about dietary defects.

It has been found, in surveys of typical urban and rural groups, that the calorie intake of some 30 per cent of families is below requirements and that even when the diet is quantitatively adequate it is almost invariably ill-balanced, containing a preponderance of cereals and insufficient "protective" foods of higher nutritive value. Intake of milk, pulses, meat, fish, vegetables and fruit is generally insufficient.

In terms of food factors, the most important deficiencies are those of proteins of high biological value, fat, vitamin A and carotene, vitamins of the B group, and calcium. Intake of vitamin C is generally low. There is also a deficiency of vitamin D in the diet which may lead to rachitic diseases when this vitamin is not obtained in sufficient quantities by the action of sunlight on the skin. Evidence from the clinical side regarding the incidence and prevalence of deficiency diseases in general supports these conclusions.

The diet of the poor rice-eater is very much the same all over India. In addition to his staple cereal he consumes only small quantities of pulses and vegetables. Intake of pulses is from 0·5 to 1·5 ounces daily; of non-leafy vegetables, 2 to 6 ounces; of vegetable oil, less than 1 ounce. Consumption of meat, fish and eggs taken together does not often exceed 1·5 ounces daily and as a rule less than this amount is taken. Leafy vegetables are eaten in small quantities while the consumption of milk is negligible. Fruit is a rare ingredient in the diet. Millet diets are in general similar to rice diets except that millet replaces rice as the main ingredient. The wheat-eater's diet usually contains more milk than that of the rice or millet-eater, since milk production is higher in the wheat-eating parts of India than elsewhere, and his intake of pulses also tends to be greater. An adequate intake of milk is, however, by no means universal in wheat-eating areas. In their content of other protective foods, wheat diets resemble rice and millet diets.

If typical Indian diets, as described above, are contrasted with the balanced diet shown in the table in paragraph 2 above, it will at once be seen that the former contain insufficient protective foods. It will, of course, be understood that we are concerned here with

broad generalizations and are ignoring the very considerable variations in the intake of certain non-cereal foods, e.g., fish and vegetables, which exist in different parts of the country. The inadequacy of the present consumption of protective foods can be illustrated by quoting an estimate made by the Imperial Council of Agricultural Research of the percentage increase in the production of various foods required to provide "a suitably balanced diet" in minimum quantity for the 400 million people of India:—

Cereals by 10 per cent.
Pulses by 20 per cent.
Fats and oils by 250 per cent.
Fruits by 50 per cent.
Vegetables by 100 per cent.
Milk by 300 per cent.
Fish and eggs by 300 per cent. [1]

Food and Health

5. The United Nations Conference on Food and Agriculture pointed out that faulty diet leads to "impaired physical development, ill-health and untimely death," and drew attention to possibility of raising general levels of health by means of diet. The Nutrition Advisory Committee (March 1944) made the following comments on these subjects:—

The ill effects of faulty and insufficient diet are manifold. The infant, maternal and general mortality rates in India are high, and the expectation of life is low. [2] Among the causes of ill-health and disease and death are contaminated water supplies, lack of sanitation, bad housing, mosquitoes and flies which carry disease, and malnutrition. There is no doubt that malnutrition occupies a very prominent position in this group of evil and lethal agents.

(*a*) Emphasis may be laid on the high mortality rates among infants, and young children, and among women in the child-bearing period. The general experience of those concerned with infant welfare work supports the view that much sickness and mortality among infants are due to the faulty feeding of mother and child. The infant mortality rate for India in 1941 was reported as 158 per thousand live births, while in certain urban areas the rate reached 250 per mille. In the same year the infant mortality rate in England was 59 per mille. In India infant deaths amount to some 24 per cent of all deaths, while in England in 1936 they amounted to only 7 per cent of all deaths.

(*b*) Perhaps even more significant is the high death rate during the early years of childhood. About half the mortality recorded in India in any given area occurs in children under 10 years, the corresponding figure for England being about 10 per cent. The pre-school child, i.e., the child aged 1–5, probably suffers more severely.

[1] Memorandum on the Development of Agriculture and Animal Husbandry in India, by Imperial Council of Agricultural Research, 1944.

[2] The following figures of expectation of life at birth (males) are taken from the "Health Atlas" published by the Government of India (Department of Education, Health and Lands):—

	Years.		Years.
New Zealand (1931) ..	65	France (1931–33) ..	54
Sweden (1931–35) ..	63	Japan (1926–30) ..	46
England and Wales (1930–32)	59	British India (1921–30).	26

from malnutrition than any other group in the population, and the mortality in this group is exceptionally high. The percetnage of all mortality occurring in the age groups 1–5 and 6–10 is 19·4 and 5·6 per cent, respectively, as compared with 2·1 and 1·1 per cent in England. When breast feeding has ceased, children of the poorer classes cannot be supplied with milk from animals as a substitute and are usually fed on an ill-balanced diet consisting of rice or another cereal, with a few vegetables. Their development is impaired and resistance to such diseases as broncho-pneumonia and dysentery—among the most important causes of death in this group—is reduced.

(*c*) The female death rate during the reproductive period (15 to 45) is higher than the male, and the excess is largely due to mortality from child-bearing. The vital statistics of England do not reveal a similar trend. Estimates of maternal mortality in various parts of India vary from 16 to 24 per thousand live births, a very high rate. The anæmias of pregnancy, unquestionably associated with malnutrition, are an important cause of maternal deaths. Further, resistance to puerperal sepsis, the principal recorded cause of maternal mortality, is often reduced by co-existent anæmia.

(*d*) Specific food deficiency diseases, i.e., diseases which are due to insufficiency of some food factor or factors in the diet and which can be prevented or cured by making good the deficiency—are in themselves a serious public health problem. The most important are perhaps beriberi, keratomalacia, rickets, and osteomalacia, clinical conditions associated with riboflavin deficiency, and goitre. Mention must also be made of various forms of anaemia, which are associated with blood-destroying diseases such as malaria and hookworm and also with malnutrition. Nutritional oedema is frequently seen among ill-nourished children and adults. In addition to well-recognized deficiency diseases, there are numerous other diseases in the causation of which nutritional factors are concerned. These include epidemic dropsy, peptic ulcer, lathyrism, flurosis, various forms of cirrhosis of the liver, urinary lithiasis, diabetes, tropical ulcer, eclampsia, sprue, and certain kinds of chronic diarrhoea, various eye and skin conditions, etc. Further research is needed to elucidate the part played by faulty diet in the causation of these diseases and of numerous other diseases of unknown etiology which are commonly seen in hospitals and out-patient departments.

(*e*) The general effect of malnutrition in lowering resistance to microbic and parasitic disease must also be emphasized. Experience gained in times of famine amply demonstrates its importance. Attention is especially drawn to the association between malnutrition and tuberculosis, a disease which is steadily increasing in prevalence. It is generally recognized that resistance to tubercular infection is decreased by diet deficiency.

(*f*) The modern public health movement is not concerned solely with the prevention of disease. It has the broader aim of creating an environment in which each individual can develop his potentialities fully and completely. This is particularly true as regards nutrition. Malnutrition produces states of ill-health and lowered physical efficiency, short of actual disease which are perhaps more important, because more widespread, than disease itself. Numerous investigations among school children in India have shown that a large percentage of children are in a poor state of nutrition, with consequent impairment of physical and mental growth. Again, in the adult population the ill-effects of malnutrition are widely evident

in the shape of a low level of general health and reduced capacity for work. On the other side, the striking improvement in the condition of army recruits which takes place after a few months of abundant and satisfactory feeding is highly significant.

The positive aspects of the campaign for improved nutrition must be strongly emphasized. Freedom from disease is one thing, abundant health is another. The goal to be aimed at is the creation of a healthy and vigorous population.

We may draw special attention to the final paragraph about the attainment of good health and physical fitness by means of good nutrition. The raising of health standards must be given a prominent position in plans for the future development of India and the improvement of nutrition is an essential part of the public health programme.

6. In other parts of our report we have discussed the question whether there has been a deterioration in nutrition and physique during recent decades and have pointed out that no conclusion can be reached on this point because of the lack of past records. If, for example, satisfactory data about the average height, weight, etc., of sections of the population, collected in 1920 or 1900, were available, these could be compared with similar data obtainable at the present time. It is important that any changes in the physical development of the population which may occur in the future should be carefully watched and recorded. The precise methods by which this can effectively be done may be left for the consideration of public health workers, nutrition workers and statisticians. It would seem perfectly feasible to obtain accurate physical records of such groups as students, labourers, school children, new-born infants, etc., in various parts of the country and tabulate these for future comparison. Actually a good deal of anthropometric data has been collected during recent years by research workers, school medical officers, university authorities, etc., which would probably be of value for the purpose in question. In several western countries fairly accurate information about the trend of national physical development during the last 50 years or more is available —in general it may be remarked, a steady improvement in development has been manifest. We feel it is desirable that India should possess similar records, and recommend that appropriate action in the matter should be taken under the guidance of public health authorities.

Economic Aspects of Nutrition

7. We have referred to the shortage of protective foods in India. Equally important is the fact that a large percentage of the population could not afford a diet containing such foods in sufficient amounts, even if adequate supplies were available. A good well-balanced diet costs more than a poor diet which contains little else besides cereals. The protective foods—milk, meat, etc.—are in general, more expensive than the " energy yielding " foods, e.g., cereals and tubers. To put it in another way, a unit of money spent on the latter gives the purchaser a larger return of calories than

the same sum spent on the former. The poor man is forced, in order to satisfy hunger, to depend largely on the cheaper kinds of foods. Economic and diet surveys have shown that in India, as in other countries, the consumption of protective foods rises with increasing income, with a corresponding decrease in the percentage of calories obtained from cereals. Lack of purchasing power is thus a most important, perhaps *the* most important, cause of malnutrition.

We may illustrate this point as follows. Before the war it was reckoned that the cost of a well-balanced diet, containing enough protective foods, was about Rs. 5 per adult per month—that is to say, Rs. 20 for a family containing the equivalent of 4 adult males. The cost of an ill-balanced diet, mainly composed of rice or another cereal and sufficient in quantity but defective in quality, was about Rs. 10 for a family of the same size. Among the urban poor 50 to 60 per cent of total income was spent on food, the percentage so spent decreasing with increasing income. Unskilled urban workers often earned Rs. 10 a month or less. To assess the real income of agricultural families is a difficult matter, since for the most part such families do not live on a cash basis. We may, however, quote with reserve some estimates which have been made of family income in certain rural groups. The average total annual income of cultivating families in Bengal was estimated at Rs. 225 by the Floud Commission[1] and at Rs. 150 by Azizul Haque[2]. The same figures for groups of poor rural families in Madras[3] and the Kangra Valley, Punjab[4], were Rs. 100 and Rs. 125 respectively. In a rural area in Mysore an economic enquiry covering 11,142 families was carried out in 1935[5]. Of these families more than half had an income of Rs. 10 to Rs. 15 per family per month or less.

Little reliance can perhaps be placed on estimates of national *per capita* income, because the basic data necessary for such calculations are not fully available. One estimate may, however, be quoted, that of Dr. V. K. R. V. Rao, who gives a figure of Rs. 65 with an error of 6 per cent, for annual *per capita* income in British India[6]. His estimate is somewhat higher than those made by various other investigators.

Such figures, approximate and open to criticism though they may be, serve to indicate the gulf between possible and desirable expenditure on food. The simple fact is that a well-balanced and satisfactory diet is beyond the means of a large section of the population. At the present time the price of cereals is well above

[1] Report of the Land Revenue Commission, Bengal, Vol. I, 1940.

[2] The Man Behind the Plough, 1939.

[3] Aykroyd, W. R. and Krishnan, B. G.—Indian Journal of Medical Research, 1937. 2: 668.

[4] Punjab Public Health Department, "An Inquiry into Diets, State of Nutrition and Factors Associated therewith, in relation to health in the Kangra Valley, Punjab, 1939".

[5] Hand-book of the Rural Welfare Centre, 1939, Closepet, Mysore

[6] National Income of British India (1931–32), 1940.

pre-war levels and that of protective foods is abnormally high. Wage levels, both agricultural and industrial, have risen, but scarcely to such an extent as to compensate for the increased price of foods. No studies have been made of the existing relation between the two. They would probably show that at present prices a larger proportion of the population than before the war cannot afford a nutritious diet.

8. We shall refer later to specific measures for providing certain vulnerable sections of the population—infants, children and expectant and nursing mothers—with additional protective foods. Such measures may be of great value, but the fact must be faced that the problem of malnutrition cannot be solved merely by a redistribution of available food supplies. The " improvement of the diet of the people " cannot be achieved without a great increase in the production of protective foods and a simultaneous increase in purchasing power. The inclusion of this item in our terms of reference extends those terms to cover the whole field of agricultural and economic development.

Summary of Conclusions

9. The main conclusions of this chapter may be summarised as follows:—

(i) Among the poor sections of the community in India, both urban and rural, there is much under-nutrition as well as mal nutrition. It has been estimated, by certain authorities, that 30 per cent of the population in normal times do not get enough to eat. Further, a large proportion of the population of India consumes a diet which does not contain protective foods in sufficient amounts.

(ii) Much ill-health, disease and mortality in India, particularly among infants, children and women in the child-bearing period, are due to malnutrition. Diseases caused by or associated with insufficiency of some food factor or factors in the diet are of common occurrence. The improvement of nutrition is, therefore, an essential part of the public health programme in India.

(iii) Steps should be taken to collect satisfactory records of standards of nutrition and physical development, with the object of obtaining a clear picture of their general trend from decade to decade in the future.

(iv) A well balanced and satisfactory diet is beyond the means of large sections of the population. The poor man is forced, in order to satisfy hunger, to depend largely on the cheaper kinds of food. The lack of purchasing power is thus a most important, perhaps the most important, cause of malnutrition.

(v) The improvement of the diet of the people cannot be achieved without a great increase in the production of protective foods and simultaneous increase in purchasing power.

CHAPTER III.—FOOD POLICY

In the first part of this report we have dealt with the existing food situation, the existing system of food administration, and the results of the Grow More Food campaign, showing that the major part of the increase in cereal production has been an increase in the production of millets. In the preceding two chapters of this part we have discussed the growth of population and its bearing on food supply and have attempted to define the problem of nutrition. The results of our examination of the present position may be briefly recapitulated. The diet of the greater part of the population is unbalanced and does not provide in sufficient quantities the nutrients which are necessary for health, or, in other words, does not contain enough protective foods. Within this majority group, there is a considerable section, perhaps amounting to 30 per cent of the whole population, which does not get *enough* to eat—i.e., is short of both energy-yielding and protective foods. It has also been shown that the poorer classes, both urban and rural, cannot afford to purchase a balanced diet even if protective foods were available in sufficient quantities. There is evidence of increasing pressure of population on existing land resources in various parts of the country, and the population is likely to increase by 100 millions in the next 25 years. At present the most widely consumed cereal, rice, is in short supply and the production of all protective foods—pulses, milk, meat, fish, fruits and vegetables—is quite insufficient. To offset this picture of the present state of affairs, there are abundant opportunities for development in agriculture and other spheres which the growth of scientific knowledge and technology has opened up. Throughout our report strong emphasis is laid on these opportunities and we consider that the resources of India both agricultural and industrial, are, if vigorously developed, such as to remove any future threat of famine and decisively raise standards of living and nutrition.

We must now consider the food policy, in a broad sense of the term, which should be followed in pressing towards this great objective. In this central chapter, which is linked with both the preceding and following parts of the report, we shall discuss the general lines of such a policy.

State Responsibility

2. The State should recognize its ultimate responsibility to provide enough food for all. We enunciate this here as a broad principle, the implications of which emerge from the report as a whole. In India the problems of food supply and nutrition are fundamental and must at all times be one of the primary concerns of Central, Provincial and State Governments. It is abundantly clear that a policy of *laissez faire* in the matter of food supply and distribution can lead nowhere and would probably end in catastrophe. All the resources of Government must be brought to bear

in order to achieve the end in view. In putting forward the principle of State responsibility for the feeding of the people we are in line with the United Nations Conference on Food and Agriculture, to whose report the Government of India is a signatory.

Recommendation III of the Conference reads as follows:—

That the governments and authorities here represented—

(a) Immediately undertake the task of increasing the food resources and improving the diets of their people in accordance with the principles and objectives outlined in the findings of the Conference, and declare to their respective peoples and to other governments and authorities here represented their intention of so doing.

Governments in India have within the last 100 years accepted the duty of preventing widespread death from famine, witness the Famine Code elaborated in the second half of the nineteenth century. The further obligation of taking every possible step not only to prevent starvation, but to improve nutrition and create a healthy and vigorous population, has not yet been fully recognized and accepted.

In times of emergency, such as the present, the satisfactory distribution of available food supplies is an essential task which must be undertaken by governments. In our earlier report on the Bengal famine and in Chapter III of Part I of this report we have dealt with this question in detail. In such times the surplus food grown by the producer should, after his needs have been satisfied, be regarded as the property of the community for which he is entitled only to a reasonable return. This principle underlies the procurement operations undertaken during the war by the Provincial and State Governments. In an emergency, rationing on a wide scale is also necessary to ensure equitable distribution. The need for these emergency measures will no doubt disappear as the food situation improves, but Governments must be ready to put them into force should there be any recurrence of a similar situation in the future. We may express here our faith that such a recurrence will not take place; it is, in fact, one of our main duties as a Commission to consider ways and means of making it impossible.

The Production of Cereals

3. Cereals are the basic food of the people of India and the food situation which has arisen during the war has emphasized their importance. The Basic Plan was in the first place concerned only with cereals, being extended later to pulses. As regards two major cereals, wheat and millets, before the war India was self-sufficient at the prevailing levels of intake. Millets are largely consumed where they are grown and there were no imports or exports. In normal times the annual exportable surplus of wheat was of the order of 200,000 tons. The supplies of rice grown in the country, on the other hand, did not meet requirements, and the annual deficit, as indicated by the import figures, was about 1,750,000 tons. India was thus normally self-sufficient in wheat but not in rice, the deficiency of the latter being made up previous to 1942.

by imports from Burma. The most important deficit provinces and states are deficit in rice. These are: the provinces of Bombay, Madras, Bengal, the United Provinces and Bihar and the states of Travancore and Cochin.

The gap caused by the cessation of rice imports has been partially filled by imports of wheat, but the latter have not been sufficient to make up for the over-all deficiency in cereals, as estimated under the Basic Plan. The cereal consumption of the rice-eating provinces has fallen. Attempts have been made to increase the consumption of alternative cereals in such areas, but these have achieved only limited success. Some well-to-do rice-eaters may take wheat as a partial substitute for rice and a proportion of poor rice-eaters may be ready to consume millets if need arises. But the great bulk of the rice-eating population cannot turn to wheat as their staple food; nor is it practicable that they should. The rice-producing areas in Bengal, Madras and various other provinces are unfitted to produce any other cereal besides rice. In general, therefore, rice-eating provinces must remain rice-eating provinces.

It is difficult to make a quantitative estimate of the future requirements of rice or indeed of any other food in relation to existing supply, since the latter is not accurately known, and allowance must be made for the fact that the intake of a considerable section of the people is below physiological requirements, and for the increase in the number of consumers with the growth of population. According to the available figures total average annual rice supplies (production in India plus net imports) were 27·4 million tons during the five years ending 1938–39. At the same level of consumption, allowing for an annual increase in population of 1 per cent, requirements in 1944–45 would be increased by 6 per cent, that is, they become 29 million tons. To allow for under-consumption on the part of a proportion of rice-eaters, we may make an arbitrary addition of one million tons, and estimate requirements in 1944–45 at 30 million tons. During the next 15 years, assuming that the population continues to grow at the same rate, and the proportion of rice-eaters in the population remains constant, requirements will increase by 15 per cent, and this means a requirement in 1960 of 34·5 million tons at a satisfactory level of intake. Annual supply at that date must be greater than the average annual production for the five years ending 1938–39, 25·8 million tons, by a third or rather more than 8 million tons.

While we are fully aware that this estimate is open to criticism in many respects, the point we wish to emphasize is that future self-sufficiency in rice involves a very substantial increase in supply. Can this increase be achieved? The area under rice has increased during the war. This has been due mainly to two factors, first, a decrease in the area under jute and a corresponding increase in the area under rice: secondly, the bringing of marginal lands under rice cultivation owing to high prices. The first factor will cease to operate after the war. The extent to

which the second will continue to operate will depend upon the level of rice prices. The area of marginal land, however, is relatively not very large, and it is unlikely that the contribution of this source to the post-war production will exceed a few hundred thousands of tons.

4. The irrigation schemes which the Madras Government propose to carry out, will produce an additional 900,000 tons of rice.[1] In Sind the construction of the two additional barrages on the Indus will probably lead to an increase in rice production of between 400,000 and 500,000 tons. The irrigation schemes under consideration in Bengal will, if carried out, increase rice production in the western part of the province but no estimate can be framed of this increase. The total increase in production due to irrigation may be in the region of, say, 1,500,000 tons, which is, of course, a very rough estimate. It will be several years, at least ten, before these large irrigation schemes come into operation. The development of large-scale irrigation schemes, which depends on the policy and action of governments, is a certain means of increasing rice production. The possibilities of land reclamation on a large scale are more difficult to assess, since it is only recently that they have begun to be explored. They are to a considerable extent dependent on the success of anti-malarial measures. Mention may be made of three proposed schemes which, if successful, would bring considerable areas of land under cultivation and add to rice production; one of these is in the Terai tract of the United Provinces and the other two in Madras, in the Wynaad in the Malabar district and the Araku Valley in the Vizagapatam district.

5. It is of the greatest importance that irrigation and land reclamation schemes should be vigorously pushed forward. But it is clear that the potential increase in production from these sources cannot fully meet future requirements and that strong emphasis must be placed on increased yields from land already under cultivation, as the foremost means of meeting these requirements. It has been estimated that rice yields can be increased by 30 per cent, viz., 5 per cent by improved varieties, 20 per cent by increased manuring, and 5 per cent by protection from pests and diseases. This has been described as a conservative estimate and it has been said that 50 per cent increase can be achieved without difficulty, that is, 10 per cent by improved varieties and 40 per cent by manure. These are theoretical possibilities. Can they be translated into practical possibilities?

The conclusion is that the possibility of increasing supplies of rice to the extent necessary to meet future requirements is largely dependent on a great increase in the supply of fertilizers.

[1] It is estimated that the Godavari Reservoir scheme, which has been included in the Madras Government's first five years plan of post-war reconstruction, and will cost Rs 60 crores, will result in the production of about 600,000 tons of rice annually, i.e., a quantity approximately equivalent to the pre-war import of Burma rice into South India.

It has been remarked that fertilizers may be of little value in the absence of an adequate water supply, but this point is irrelevant in the case of rice lands, for rice can only be grown on land sufficiently supplied with water. In the chapter on manures we have pointed out some of the difficulties to be overcome in obtaining a large increase in the use of manures. It has been estimated by Dr. Burns that in order to increase the outturn of rice by 20 per cent, the following tonnages would be required:—

Manure.	Tons.	Manure.	Tons.
Oil cake	3,052,000	Farm-yard manure or compost	30,520,000
Bone meal	3,815,000	Green manure	21,800,000
Sulphate of ammonia.	763,000		

These quantities are very large in relation to present supplies and illustrate the scale of the effort required to bring about a substantial increase in rice yields by means of fertilizers.

6. With regard to wheat and millets, the position is more favourable than in the case of rice. There was a small exportable surplus of wheat before the war. Adopting approximately the same method of calculation as that followed above for rice, we may assess wheat requirements in 1960 at about 12 million tons, as against the present yield of about 10 million tons annually. Irrigation is the most important means of increasing the production of wheat; a well-irrigated wheat field may give double the yield of an unirrigated field. Manuring is also important, but water comes first. Hence it is mainly to the development of irrigation that we must look to increased supplies of wheat to meet future requirements.

The area under the two principal millets, jowar and bajra, has increased considerably during the war as a result of the decrease in area under cotton. There has been a substantial rise in the production of bajra (from 2·6 million tons in 1938–39 to 3·7 million tons in 1943–44) but that of jowar has remained stationary, probably because of unfavourable climatic conditions. Presumably the land turned over to jowar and bajra during the war will again be put under cotton in the post-war period, so that the area under these millets will return to its former dimensions. The pre-war annual production was about 9 million tons, representing self-sufficiency with the proviso that some millet-eaters were under-fed. This means a requirement of about 11·25 million tons in 1960. A similar order of increase will be called for in the case of other millets, such as ragi.

Jowar is grown in areas of relatively low rainfall. Very large increases in yield can be obtained by irrigation: dry crop yields range from 300 to 700 lbs. per acre, whereas yields from irrigated land may be as high as 1,200 to 1,500 lbs. Generally speaking, however, jowar is grown on areas in which irrigation is difficult because of climatic conditions and physiographical

[1] Chapter II of Part II.

characteristics, and will remain difficult. It is therefore unlikely that irrigation will play an important part in increasing the production of jowar and reliance must mainly be placed on the development of efficient dry farming methods, which include contour bunding for the conservation of rainfall. We place special emphasis on the latter. Manuring can also play an important part. According to an estimate made by Dr. Burns, an increase of the order of 20 per cent is possible by the application of various dry farming methods including the use of fertilizers.

Bajra is generally speaking grown on soil which is poorer than that under jowar and which receives a smaller rainfall. Dr. Burns considers that it should be possible to increase the average yield of bajra from 320 to 400 lbs. per acre, that is, by 25 per cent by the use of more efficient dry farming methods.

7. We consider that self-sufficiency in cereals, at a satisfactory level of intake, should be one of the cardinal aims of food and agricultural policy. It is, of course, obvious that requirements of cereals are related to the supply of non-cereal foods, and that if the production of the latter is increased the demand for cereals will be correspondingly reduced. In putting forward this objective in regard to cereals, we do not, however, propose that the producer should be compelled to grow cereals in preference to other food or non-food crops except in an emergency, such as that created by the present war. We do not consider it necessary or desirable that an uneconomical diversion of cultivation from non-cereal crops to cereal crops should be compulsorily effected for the purpose of achieving self-sufficiency in cereals.

It is clear that so long as the amount of cereals needed for consumption exceeds the production within the country, supplies from abroad will be necessary. How long the need for imports will persist depends on the progress towards increased yields achieved by the various methods we have discussed. We do not under-estimate the difficulties; in fact we insist, here as often elsewhere in our report, that an enormous and untiring effort is necessary to attain the end in view. But such an effort can and must be made.

Price Control.

8. If agriculture is to develop and the agriculturist to prosper, the latter must be assured of a satisfactory price for the cereals he produces. The State must therefore determine from time to time the minimum prices of rice and wheat which are fair to the producer, and maximum prices fair to the consumer, and ensure that prevailing prices fall within this range. This subject is discussed in Chapter VI of Part I as well as in Chapter II of Part IV. If the prices of wheat and rice are controlled at satisfactory levels, those of other cereals are likely to follow the same trend.

Students of economics all over the world are generally agreed that a fair return to the cultivator is one of the foundations, not

only of agricultural prosperity, but general prosperity also. The present world shortage of food may appear to render any precipitate fall in agricultural prices unlikely for some years to come, but world recovery may be more rapid than is generally anticipated and it is impossible to predict the course of events. Any repetition of the agricultural slump of the thirties would be disastrous to India and might bring progress to a standstill. We ourselves lay strong emphasis on this aspect of food policy.

Supplementary and Protective Foods

9. It is unnecessary to repeat that a diet largely composed of wheat, rice, millet or any other cereal is an ill-balanced diet. While we have stressed the importance of increasing cereal production, it is clear that this will not improve the diet of the people in respect of quality. In the chapter on nutrition[1] a well-balanced diet for an adult male, drawn up by the Nutrition Advisory Committee, is given; this diet contains 14 oz. of cereals—that is, rather less than the standard at present adopted in food administration—and quantities of non-cereal foods greatly in excess of existing intake. This diet was translated into terms of over-all requirements by the Nutrition Advisory Committee and the results are shown below. Allowance is made for the growth of population, that is, the requirements as stated are those of 400 million adult males, or a population of 500 millions.

Estimated annual requirements of foodstuffs for human consumption.

	Million tons.	
1 Cereals	57	
2 Pulses	12	
3 Vegetables—		
(i) Green leafy	16	
(ii) Non-leafy including tuberous vegetables	24	
4 Fruits	12	
5 Sugar and jaggery	8	
6 Fats (oils and *ghee*)	8	
7 Milk	46	
8 Fish and meat	9*	
9 Eggs	102,000	million eggs *

We may add some comments on production targets of this nature. In the first place, they represent a very remote ideal. The United Nations Conference on Food and Agriculture recommended that "dietary standards or allowances based upon a scientific assessment of the amounts and quality of foods, in terms of nutrients, which promote health" should be adopted as "the ultimate goal of food and nutrition policy," but at the same time it recognized that it would be necessary, in the poorer countries of the world, to set up *intermediate* objectives more easy of attainment, which "with the continued and expanding application of science to the development of the world's food resources, can be gradually raised in the direction of the ultimate objective." We are in agreement with these views. The chief value of production

[1] Chapter II of Part II.

* Assuming that 30 per cent of the population is vegetarian and would not partake of these foods.

targets based on a scientific assessment of nutritional requirements at the highest level, is that they indicate in a general way the direction in which progress should take place, and thus provide guiding lines for food and agricultural policy.

10. The production of one kind of food cannot be considered apart from that of other foods. For example, to increase the supply of milk, it is necessary to devote more land to fodder crops and pasture, and this may conflict with projects for the greater production of cereals and pulses. Again, the requirements of the different foods are influenced by the availability of other foods, and in planning food production due weight must be given to the intensity of the effort, immediate and remote, needed to extend the production of the various foods. The Nutrition Advisory Committee comments on this point as follows:—

> The fact that cereal requirements, as part of a programme which calls for the production of other non-cereal foods far in excess of the present level, are evaluated in this report at 14 oz., makes it essential to emphasize strongly that 14 oz. of cereals per day are adequate only if the diet contains the other foods listed in Table II in sufficient quantity. At present production of the latter is highly insufficient and enormous effort will be needed over a period of years to bring it to a position approaching adequacy. Since the Committee are informed that it is more immediately feasible to increase the production of cereals than that of other foods up to the required standard, emphasis must be laid on more cereals as part of short-term production policy. Further, there is a serious shortage of rice in the country if requirements are assessed in terms of the demand of those who prefer rice to other cereals.

11. Let us consider the production of supplementary foods in its practical aspects. Pulses are an important ingredient in Indian diets, since they supply protein and other nutrients. There are considerable differences in the level of consumption in different parts of India; for example, in rice-eating areas in which pulses are most needed to supplement the staple cereal, intake tends to be smaller than in wheat-eating areas. If the present production of pulses for human consumption is taken to be 7·5 million tons, the figure put forward by the Nutrition Advisory Committee represents an increase of 60 per cent as a long-term target. In our report on Bengal we discussed the position in regard to pulses and pointed out that at present there is a glut in some provinces and a shortage in others, and that supply and demand appear to be uncorrelated. The question of pulse production and supply, in accordance with the needs and preferences of the different provinces, requires detailed study, and that of increasing yields by the introduction of improved varieties, etc., demands the close attention of agricultural research workers and departments. We understand that work on pulses is included in the programme of the Imperial Council of Agricultural Research. Apart from their nutritive value, pulses have an important part to play in

maintaining the fertility of the soil by adding to its nitrogen content. The whole subject is of very definite importance in connection with food policy.

Brief reference must be made here to soya-bean, the production and popularization of which in India, as a partial solution of the problem of nutrition, have often been strongly advocated. Soya-bean, an important food in China and Japan, is rich in protein and fat and is a high-yielding crop. Prepared for consumption in the same way as the common pulses of India, it is somewhat unpalatable, and in China and the Far East generally it is usually consumed in the form of traditional preparations, e.g., sauces, made not in households but in special shops. Its palatability can also be improved by various methods of factory processing, by which the unpleasant aromatic substances which it contains are removed. It is clear that a very considerable effort would be needed to popularize this unfamiliar food in India. The Nutrition Advisory Committee have carefully studied the *pros* and *cons* of the question, and, after a series of conjoint investigations carried out in four different laboratories, reached the conclusion that " the nutritive value of soya-bean, in comparison with that of other common Indian pulses, is *not* such as to justify, from the standpoint of human nutrition, the immediate encouragement of the production and consumption of soya-bean on a wide scale in India."

Soya-bean is, of course, a crop of considerable industrial importance. It is a rich source of oil, which has many industrial uses, and it also provides raw material for the manufacture of plastics which are basic to many branches of modern industry. In the United States soya-bean is widely cultivated as an industrial crop. With the growth of industry in India its cultivation for industrial purposes may be called for. Soya-bean flour suitably processed in factories, produced, as in the United States of America, as a by-product of the development of soya-bean cultivation for industrial uses, may be more acceptable and of higher nutritive value than the untreated pulse. Soya-bean is a leguminous crop of value as fodder and in the rotation of crops, and the part it could play for these purposes in Indian agriculture is worthy of investigation. With regard, however, to its use as a substitute for common Indian pulses, cultivated, prepared, and consumed in the same manner as such pulses, we are in agreement with the findings of the Nutrition Advisory Committee.

12. Vegetables and fruits are discussed at length in a later chapter.[1] A large increase in the supply of these foods is needed and is perfectly feasible. We have emphasized the need for greater production of vegetables, particularly green leafy vegetables, for local consumption. We also consider later[2] a group of non-cereal foods, potatoes, sweet potatoes, tapioca, and plantains, which have the characteristic of giving a higher calorie

[1] Chapter X of Part III. [2] Chapter IX of Part III.

yield per unit area than cereals and pulses. These foods are deficient in protein and if they are taken as the main ingredient in the diet protein intake is seriously reduced. It is not, of course, the custom in India to take potatoes, sweet potatoes, and plantains as a staple article of diet, though in certain areas at certain seasons sweet potatoes are widely consumed. The conclusion is that, provided supplies of protein from pulses and fish can be simultaneously increased, an increase in the production of these foods has much to recommend it from the standpoint of food and agricultural policy, with particular reference to economy in the use of land. It would reduce the demand for cereals and release land for the production of other foods. As regards tapioca, the position is more doubtful; this root, which is highly deficient in protein, tends to be eaten as a staple rather than as a supplementary food, replacing rice to an extent which is nutritionally undesirable. This question is considered in more detail in Chapter IX of Part III.

13. Intake of fats and oils is at present too low, and an increase of the order of 200 to 250 per cent has been recommended on nutritional grounds. In most parts of India the chief source of fat in the diet is vegetable oil; milk fat (*ghee*) is consumed by the poorer classes to some extent in certain provinces in Northern India, but elsewhere its consumption on the part of these classes is in general negligible. One part of vegetable oil is equivalent, in calorie value, to about 2½ parts of cereal, so that an increased supply of vegetable oils would have an appreciable effect on cereal requirements. We have pointed out elsewhere the advantages of developing the oil-crushing industry, thereby obtaining more oil-cake for cattle food and manure. An increased production of oil-seeds, and their processing in India, would result in greater supplies of oil for human consumption, both in the form of the oil itself, and as hydrogenated oil or *vanaspati*. While *vanaspati* or ' vegetable *ghee* ' is in certain respects inferior to animal *ghee* in nutritive value, supplies of the latter are grossly deficient, and we feel that the present policy of the Government of India of encouraging the *vanaspati* industry is justified. It must be added that in recommending the increased production and consumption of vegetable oil we are assuming that an all-round improvement in the diet in other respects will take place simultaneously. There are some scientific grounds for supposing that if the fat content of a poor cereal diet is raised without other improvement in the diet the result may be unsatisfactory from the standpoint of nutrition. We recommend that this question should receive the careful consideration of nutrition research workers.

14. Sugar, either refined or unrefined in the form of *gur* or jaggery, is a food of importance in India, the production of which has been greatly extended within recent years. While it is a carbohydrate food, containing no protein or vitamins, it supplies calories, and since there is much under-nutrition calories are needed. *Gur* or jaggery contains some mineral matter of

nutritive value which is absent from refined sugar. The present *per capita* intake of sugar in all forms in India is much lower than peace-time intake in most western countries, and we believe that its production and consumption can with advantage be considerably increased. Sugar is, however, in no sense a 'protective' food, and in formulating agricultural policy the greater nutritive value of various other foods must be borne in mind.

15. The animal foods, milk, meat, fish, and eggs, are prominent in the group of 'protective' foods. Experiments have shown that milk is the best of all supplements to cereal diets, and the improvement in the health and development of Indian children which results from the regular intake of 8 to 12 oz. of milk daily, has been repeatedly demonstrated. We are fully aware of these facts, as well as of the importance of cattle in farm economy, and of the advantages of 'mixed farming' whereby milch cattle contribute manure and add to the fertility of the soil. But looking at the problem realistically, we cannot visualize any immediate possibility of increasing the production of milk to such an extent that it can become a regular article of diet consumed in adequate quantities by the poorer classes in the greater part of India; very reluctantly we conclude that the ideal set by nutrition experts—half a pound of milk or more daily for every child in the country—is not a practicable objective attainable within the next few decades. Every effort must, however, be made to increase supplies of milk products, and we regard this as a most important aspect of food policy. The more milk the better, even if all cannot be adequately supplied. Possibilities of developing production vary in different parts of the country and while efforts to increase supplies should be made everywhere, there are unquestionably certain areas, e.g., Bengal, Bihar, Orissa, Cochin, Travancore, and parts of Madras, which for a number of reasons are less suited for such development than others. In such areas there are other means of improving the diet to which special attention must be given in planning food policy.

Imports of dried separated milk can to some small extent make up for deficient supplies within the country. We consider that the import of this valuable and relatively cheap protective food, for distribution to children in schools, etc., is fully justified. The manufacture of dried and condensed milk in the limited areas in which the dairy industry is well-developed is also to be recommended; such milk could supplement supplies in areas in which milk is scarce.

16. The consumption of meat in India, as in most sub-tropical and tropical countries, is low. We do not think it possible for India to become a meat-eating country, in the sense that Northern Europe and America are meat-eating countries, and feel that, while some increase in supply is desirable, meat cannot be given a prominent position in the production programme. The same applies to eggs, an expensive article of diet beyond the means of the poor in most parts of the world. Poultry farming on a

commercial scale should be vigorously developed in the neighbourhood of urban centres, and the production of eggs both for marketing and immediate consumption, as a subsidiary village occupation, must be included in the programme of rural development. But the habitual consumption of eggs on the part of the poor in urban and rural areas must be regarded as a remote objective and other methods of improving the diet of the population are more immediately feasible. We have emphasized strongly in Chapter XI of Part III that the supply of fish can and should be greatly increased and have pointed out that ' the development of sea, estuarine and inland fisheries is one of the most promising means of improving the diet of the people.' Fish is not equivalent to milk in nutritive value, but has some of the useful dietary properties of the former, i.e., it is a good source of protein. In many parts of the country fish should become the main protective food of animal origin in the diet of the masses.

17. The food production policy which we suggest can be summed up as follows: Self-sufficiency in cereals, the basic food of the country, should be a main objective. To balance cereals, it is essential to increase the production of pulses, fish, vegetable oils, vegetables and fruits. Certain highly productive foods, notably potatoes, sweet potatoes, and plantains, should be grown in greater quantities to relieve pressure on land and add to the total supply of calories. Supplies of milk and eggs should be increased as far as possible. If these objectives can be achieved, the national diet will be a reasonably satisfactory diet, compatible with much higher levels of health and physical development than those at present existing, even if milk, eggs and meat enter sparingly into the diet of the bulk of the population in many parts of the country. It may be added that we have attempted here to define only the broad lines of food production policy. The approach must differ in some respects in different provinces and be modified to some extent in accordance with experience and achievement. The basic principle is the development and adjustment of agricultural production to meet nutritional requirements.

Improving the Diet of certain groups in the population

18. We have considered this question in Chapter XII of Part III in which stress is laid on the development of schemes for providing a midday meal to children in schools. Other groups whose diet requires special attention are infants, pre-school children and expectant and nursing mothers. Special measures to safeguard the nutrition of " vulnerable " groups were recommended by the United Nations Conference on Food and Agriculture. We endorse this recommendation and regard such measures as an important part of State food and nutrition policy. In Chapter XII of Part III we have also discussed other matters which have a bearing on such policy, including the encouragement of nutrition research, the organization of practical nutrition work, the education of the public about diet, the milling of cereals, food industry, vitamin pills and concentrates, food yeast, and food standards and food control.

THE REORGANIZATION OF AGRICULTURE

19. The discovery of improved farming methods is of little value unless the cultivator can make use of them. The production programme which we have outlined depends for its execution on the labours of millions of cultivators, large and small, and unless they can benefit from the resources made available by science, progress will be impossible. Accordingly, we have devoted considerable attention to questions of land tenure, rent, co-operation, and agricultural economy generally. The investigation of such problems, and their solution where they stand in the way of increased food production, is a vital aspect of food policy.

THE DEVELOPMENT OF INDUSTRY

20. Improvement in diet and a rise in the standard of living are very nearly equivalent objectives. In order to increase agricultural production and improve the national diet, simultaneous industrial development to augment the total wealth of the country is essential. The growth of industry will itself help to solve some of the most thorny problems of village economy, such as excessive population pressure on land, rural unemployment, etc. There can be no question that India possesses great potentialities for industrial development which have as yet been opened up only to a small extent. Just as Governments should recognize their responsibility to provide food for all, so also they should recognize the responsibility of developing economic resources to the fullest extent. Signs of a new attitude towards this matter are visible in the post-war reconstruction plans put forward by the Central and Provincial Governments.

21. For convenience we repeat below the main lines of our proposed food policy:—

(i) Government responsibility for increasing food resources and improving the diet of the people.

(ii) Self-sufficiency in cereals.

(iii) Control of the price of cereals to ensure a reasonable return to the cultivator.

(iv) Increased production of certain protective and supplementary foods.

(v) The reorganization of agriculture.

(vi) The development of industry.

PART III

IMPROVEMENT OF FOOD PRODUCTION AND NUTRITION

PART III

Improvement of Food Production and Nutrition

CHAPTER I.—IRRIGATION

Among the measures that may be adopted for increasing the area under cultivation and the yield of crops on land already under cultivation, the first place must be assigned to works for the supply and conservation of water. We quote the following from the report of the Irrigation Commission of 1901–03:—

Where, however, the annual rainfall is below 10 or 12 inches, cultivation becomes practically impossible without irrigation. On the other hand, in Eastern Bengal, and Assam and the narrow strip between the Western Ghats and the Arabian Sea, the rainfall, which exceeds 70 inches has always been so abundant that the chance of its serious failure may be regarded as extremely remote. Between these areas, in which the crops are thus rendered safe by exclusive reliance on irrigation or by an assured and abundant rainfall, lies a vast tract[1] of nearly a million square miles of which, in the absence of irrigation, no portion can be deemed absolutely secure against the uncertainties of the season and the scourge of famine.

Although the area under irrigation has expanded greatly since the Irrigation Commission reported there are still numerous tracts in British India and the Indian States in which the agriculturists' greatest need is an assured water supply, and in which water is the most potent agent for increasing the yield of crops. Many local and other conditions, however, impose limitations on the extension of irrigation and there are vast areas, particularly in peninsular India, which must of necessity continue to depend upon rainfall. But the existence of these limitations makes it all the more incumbent to utilize to the utmost all such means as exist for the extension of irrigation and the conservation of rain water.

Area under Irrigation

2. The following table gives figures showing the average acreage under irrigation in British India from Government works during the quinquennia ending 1921–22 and 1941–42:—

Province.	Average area under irrigation during the quinquennium ending 1921–22.	Average area under irrigation during the quinquennium ending 1941–42.	(In thousands) Increase (+) Decrease (—).
	ACS.	ACS.	ACS.
Bengal	109	204	+ 95
Bihar	672	700	+ 28
Bombay	381	494	+ 113
Central Provinces and Berar	310	458	+ 148
Madras	6,945	7,464	+ 519

[1] The tract lies partly in British India and partly in Indian States.

Province.	Average area under irrigation during the quinquennium ending 1921–22.	Average area under irrigation during the quinquennium ending 1941–42.	(In thousands) Increase (+) Decrease (—).
	ACS.	ACS.	ACS.
North-west Frontier Province	360	492	+ 132
Orissa	681	645	— 36
Punjab	9,719	12,533	+2,834
Sind	3,161	5,010	+1,849
United Provinces ..	3,293	5,418	+2,125
	25,631	33,438	+7,807

Note.—The area sown twice a year under irrigation is counted twice.

It will be noticed that of the total increase of 7·8 million acres under irrigation, 6·8 millions lie in the three provinces of the Punjab, Sind and the United Provinces; that the increase in the provinces of Bombay, Bihar, Central Provinces and Berar and the North-West Frontier Province is small; and finally, that the irrigated area in Orissa has contracted slightly.

3. The table below gives figures showing the average acreage under irrigation in British India from works belonging to and maintained by private persons during the quinquennia ending 1921–22 and 1941–42:—

Province.	Average area under irrigation during the quinquennium ending 1921–22.	Average area under irrigation during the quinquennium ending 1941–42.	(In thousands) Increase (+) Decrease (—).
	ACS.	ACS.	ACS.
Bengal	1,125	1,028	— 97
Bihar	4,064	4,332	+ 268
Bombay	712	773	+ 61
Central Provinces and Berar	709	933	+ 224
Madras	Not available.	1,700[1]	..
North-west Frontier Province	601	588	— 13
Orissa	Not available.	850	
Punjab	4,191	5,257	+1,066
Sind	..	Not available.	
United Provinces ..	8,202	8,015	— 187

The figures for the provinces of Bengal and Bihar are not accurate and it is not certain that there has been an increase in the irrigated area in Bihar. The Government of Bihar have informed us that the figures include large areas in which the irrigation systems have been out of order for many years. There has been a considerable increase in the area irrigated in the Central Provinces and Berar and the Punjab. This is due to an increase in the number of private wells. Although the figures are not accurate they afford clear indication of the important part which irrigation from private sources plays in providing water for purposes of cultivation.

[1] Figure is for the year 1942–43.

EXTENSION OF IRRIGATION WORKS BELONGING TO GOVERNMENT

4. In our questionnaire we asked the provinces to supply us with information about the possibilities of increasing the area irrigated by works belonging to Government. In the Punjab although the area under irrigation from Government works has steadily increased from 2·3 million acres in 1887–88 to an average of 12·5 million acres during the five years ending 1941–42, the possibilities of further expansion are not exhausted. The Punjab Government have told us that it is proposed to carry out the following projects during the post-war period:—

Name of project.	Anticipated additional area to be brought under irrigation (acres in thousands).
(1) The Khizar Branch[1] of the Thal project	495 (gross).
(2) The Rasul Hydel Tubewell project	700 (annual).
(3) The Kishau Dam project (including a hydro-electric project)	334 ,,
(4) The Gurgaon project	122 ,,
(5) The Giri Dam project (including a hydro-electric project)	200 ,,
(6) The Bist Doab Canal project	180 ,,
(7) The Bhakra Dam project (including a hydro-electric project)	1,600 (gross).
	3,631

The Madras Government propose to take up 19 projects of which the largest are the Godavari, the Tungabhadra, and the Lower Bhavani reservoirs and the Gandikota project. The additional area expected to be brought under irrigation by these schemes is about 2·5 million acres. The Madras Government attach great importance to the Godavari reservoir which is expected to irrigate 1·5 million acres and produce extra foodgrains amounting to 600,000 tons of rice. In Sind it is proposed to construct two new barrages over the river Indus, one in Upper and the other in Lower Sind. The increase in the irrigated area is estimated at 2·5 million acres and it is anticipated that the schemes will be in operation within ten years.

The Government of Bengal propose to prepare several major irrigation projects, namely, the More project, the Howrah-Hooghly flushing and irrigation scheme, the Darkeswar Reservoir project and others. We gather, however, that little progress has been made in the drawing up of these schemes. The Government of Bombay have included, in their postwar plan, irrigation schemes roughly estimated to cost Rs. 14 crores, and 11 schemes, mainly for the construction of storage dams, have been selected for detailed investigation. The Government of the United Provinces have informed us that a number of postwar development schemes are under investigation, including combined storage and power generation schemes, state tubewells, river pumping schemes, and extensions to existing canals. We gather, however, that these schemes, with the exception of a further series of 200 tube-wells,

[1] This project is already under construction.

are still in the early stages of investigation. It should be explained that these schemes are in addition to those being carried out under the Grow More Food Campaign, viz., the construction of 1,000 miles of new channels and 400 tube-wells for the irrigation of an additional area of 579,000 acres.

The Government of Bihar have in hand a number of small schemes, including tube-well and river-pumping projects, but no large scheme is at present contemplated. In the Central Provinces and Berar, Orissa and the North-West Frontier Province the programmes do not include any scheme of large dimensions, but experimental schemes for pumping from rivers and the construction of tube-wells are being carried out in the latter province which may open the way to larger developments.

5. From the short review we have given in the previous paragraph of the possibilites of increasing the area irrigated by works belonging to Government, it would appear that there is still scope for the construction of works designed to utilize the surface flow of water for the purpose of irrigation. We cannot express any opinion on the technical aspects of these schemes; that is a matter for the technical advisers of the Governments concerned; but we trust that work on them will be commenced at the earliest possible date. They are all important. For instance, the Bhakra Dam Project and to a lesser extent the Kishau Dam Project will bring relief to a large area in the districts of Hissar, Rohtak and Gurgaon in the Punjab and in the adjoining States of Bikaner and Patiala which are at present very liable to famine. Further the hydro-electric works, to be associated with these storage projects, will enable large scale pumping to be done from tube-wells for the reclamation of water-logged areas and the supply of water for irrigation. Similarly the Tungabhadra, the Lower Bhavani and the Gandikota projects in Madras will provide irrigation to an area which suffers frequently from scarcity or famine, and the Godavari reservoir will very materially increase the production of rice. We attach great importance to the flushing and irrigation schemes which the Bengal Government propose to prepare for the improvement of large areas in West and Central Bengal. These areas no longer receive the fertilizing silt from the large rivers which formerly flowed through them, and in consequence the fertility of the soil is deteriorating. Malaria is also becoming more prevalent. The carrying out therefore of irrigation and flushing schemes in these areas is a matter of great urgency. We also attach importance to the schemes proposed by the Government of Bombay, for there are many tracts in that province which are urgently in need of protection against famine.

Financial Criteria

6. At the present time, before a major irrigation work is undertaken, its financial soundness is assessed by estimating the net annual revenue directly attributable to the work in question, i.e., the gross receipts from water rates, land revenue, interest on capital receipts from the sale of crown lands, etc., less working

expenses. A work is not undertaken unless the estimated net annual revenue is sufficient, at the end of the period prescribed for development, to cover the annual loan charges. In the case of irrigation works which afford protection against scarcity or famine—many works are of this type—account is also taken, or should be taken, of the saving in relief expenditure, whether the latter takes the form of direct relief to persons in distress or revenue remissions granted on the partial or total failure of crops. It is now more difficult to find schemes which are calculated to yield, on the present basis of computation, an adequate financial return than it was when large scale irrigation works were first initiated. We feel that some change in the existing attitude of governments towards the financial aspects of irrigation is necessary, for otherwise they may be reluctant to take up schemes which are necessary to increase agricultural production. In the first place, under the present system allowance is not made for additional revenue indirectly accruing to government as a result of the increase in wealth of the population concerned, e.g., by increased receipts from sales taxes, stamps and income-tax (including agricultural income-tax). No doubt it is difficult to assess such revenue accurately, though the receipts in areas which have been successfully brought under irrigation may be of guidance. We are of the opinion, however, that indirect revenue of this nature should be given due weight when irrigation schemes are under contemplation.

In the second place, the improvement of the well-being and standard of living of the population are the direct concern of governments. Successful irrigation schemes promote these ends, which cannot be satisfactorily reduced to terms of hard cash and increase in revenue. In view, however, of their importance, there is, in our opinion, nothing intrinsically unsound in the propositions that general revenues should contribute towards the loan charges of irrigation schemes, and that well-considered schemes may be undertaken even when, in their financial aspects, they do not fully conform with the criteria hitherto adopted.

Tubewells and River Pumping Projects

7. The Ganges Valley Tubewell Irrigation Scheme in the United Provinces marked a new development in irrigation practice in India. Under that scheme which now comprises about 1,700 tubewells, of which 1,300 were installed during the three years 1935–37, some 700,000 acres are irrigated in years of average rainfall. A feature of the scheme is that water is sold to the cultivator on a volumetric basis enabling him to co-ordinate his requirements for tubewell water with the rainfall. According to Sir William Stampe, who was responsible for the execution of this scheme and who is now Irrigation Adviser with the Government of India for Grow More Food projects, four conditions are in general essential for the success of a tubewell irrigation scheme. Firstly, the flow of water in the subsoil must be adequate to meet the surface demands, thus ensuring a stable water table, secondly, the depth of this water table below the ground level must not ordinarily

exceed about 50 feet, thirdly, the irrigation demand must prevail over a wide tract for an average period of not less than 3,000 hours in a year, and fourthly, electric power must be available over the tract in question at a rate not exceeding half an anna per unit. Experiments and investigations are now being made in different parts of India with the object of deciding whether other areas exist where conditions are favourable for tube well projects.

We have also been informed that experience in river pumping in the United Provinces has shown that water can be economically lifted from deep-set rivers on to high ground commanding lower areas by means of canals, provided first, the lift does not, as in the case of tubewells, exceed 50 feet, secondly that power is available at a rate not exceeding half an anna per unit, and thirdly that the cost of the river control works is not heavy. Several projects of this nature are in operation in the United Provinces and experimental stations are now being erected in different parts of India. If these experiments are successful, it will be possible to bring under irrigation areas which cannot be served by gravity canals. The more extensive use of these forms of irrigation is clearly linked with the development of hydro-electric-cum-thermal grid schemes; a matter to which we refer in greater detail in a later paragraph.

Private Irrigation Works, Wells and Tanks

8. We have referred to the important part which irrigation from private sources plays in providing water for purposes of agriculture. Indeed we regard the development of irrigation from private works as at least equal in importance to that of irrigation from works constructed by Government. If India's production of agricultural produce is not only to keep pace with but overtake the growth of population it will not suffice to extend irrigation through projects constructed by Government; private irrigation works must also be greatly expanded.

9. Wells are the most important among private irrigation works. The following table shows the number of wells in actual use and the area irrigated by them in 1938–39 :—[1]

[1] *Triennial Review of Irrigation in India*, 1936–1939.

Province.	Number of wells in actual use in 1938–39.	Total area irrigated by wells in 1938–39 (acres).
Madras	645,000	1,388,000
Bombay	290.000	768,000
Bengal	Nil	Nil
United Provinces	1,135,000	5,554,000
Punjab	340,000	4,749,000
Bihar	Not available	473,000
Central Provinces and Berar [1]	129,000	134,000
North West Frontier Province	14,000	81,000
Orissa	200	200
Sind	19,000	40,000
	2,572,200	13,187,200

[1] The number of irrigation wells in the Central Provinces and Berar in 1941–42 is given as 170,000.

The area irrigated from wells has increased considerably since the Report of the Royal Commission on Agriculture in 1928, the increase being of the order of 1·75 million acres. The major part of this increase has taken place in the United Provinces and in the Punjab.

The Indian Irrigation Commission of 1901–03 observed in regard to irrigation from wells as follows:—

166. It has been shown that well-irrigation varies in extent to an extraordinary degree in the different provinces and that the variation is presumably due to immutable differences of physical conditions. It is, however, certain that there is no single province in which this form of irrigation might not be very largely extended with advantage. Even in the Punjab and United Provinces in which the largest areas are irrigated, there are tracts very poorly equipped in relation to their capacities. In some districts abundantly equipped, wells are so essential to successful cultivation, and to the maintenance of a dense population, that endeavours to multiply them should be maintained and sustained until the very maximum numbers have been reached which can profitably be employed. There are also tracts in which water lies so close to the surface that canal irrigation may be not only unnecessary but actually harmful, but in which, nevertheless, irrigation of some kind is urgently required in order to get full production in ordinary years and to save the crops in times of drought. For such tracts wells are a necessity. In other tracts . . . wells are of immense service in supplementing deficiencies in supply. In all such places the construction of wells should be liberally encouraged.

167. In Central and Southern India wells are relatively few and the areas which can be protected by each well are small. The need for them is also urgent, not only for the increase of production and the support of a dense population but because they supply the only apparent means of protection against severe and frequently recurring drought in vast tracts, into which except at prohibitive expense, it is physically impossible to take canals, or if taken, to assure them a supply of water when it is most needed.

We feel we need offer no apology for quoting at length from the report of the Irrigation Commission. Wells are a most important source of irrigation and if the area under irrigation is to expand to the fullest extent, a large increase in the numbers of private wells is imperative.

10. There are several ways in which the State may encourage the development of private wells. We would first refer to the need for further research into sub-soil water supplies. In some areas, knowledge of the nature of the sub-strata and the sub-soil water are reasonably complete and in these areas Government are in a position to advise as regards the probability of finding water. In other areas, however, information is incomplete and Government are not able to offer advice about the sinking of wells. It is in these areas that further investigations are required. We attach great importance to the collection of full information as regards

subsoil water supplies and we note that this is a matter which will be examined by the newly constituted Central Waterways, Irrigation and Navigation Commission in consultation with Provincial Governments. The second point to which we would draw attention is the need in those areas, in which Government, in view of the data available, are in a position to advise as regards the sinking of wells, of a special staff to which the villager who wishes to construct a well (or indeed any work for the better utilization of water) can turn to for technical advice and assistance. As the Royal Commission on Agriculture pointed out, the members of this staff should not wait to be consulted by the landholder; they should go to him. Their duty should be to get into touch with the villager in the village, discuss with him problems arising out of his water-supply, advise him as regards the improvement of an old well or the construction of a new one, give him an idea of the cost of the work, and tell him how he should proceed in order to obtain financial help from Government. Such a staff may not be so necessary where the sinking of wells presents little difficulty, but we feel that in many areas the number of wells will not increase unless a special staff of this character is employed. It should also be possible to employ this staff on making enquiries into applications under the Land Improvement Loans Act, advising on the payment of instalments and supervising the expenditure of the loans when they have been sanctioned.

Another method by which we consider that well irrigation can be encouraged is the employment of more efficient means for lifting water, especially in tracts having a deep water table. Under present conditions animal power is generally the sole means of lifting water. Not only is the amount of water that can be lifted thus unduly restricted, but a heavy load is imposed on the cattle power available in the village. If first, means could be devised for increasing the yield of open wells by tapping additional strata, either by tubes or headings, and, secondly, suitable mechanical devices could be organized to operate persian wheels or other forms of mechanical lift by power, not only could bullock power be conserved for other agricultural purposes, but the protective range of open wells could often be substantially increased. We are of opinion that an intensive study of such methods should be carried out by Government, with a view to their application in tracts where the water table is deep, and where widespread electric power is likely to become available under the various hydro- and thermal-electric grid schemes now being projected in many parts of India.

11. The construction of a well involves considerable capital outlay and we see little chance of an appreciable acceleration in the rate of construction of wells, unless funds in the way of loans and grants are provided by Government. The Irrigation Commission of 1901–03 expressed the opinion that the chief way in which Government can assist in extending well irrigation, is by liberal advances (takavi loans) under the Land Improvement Loans Act (XIX of 1883). We take the same view and we note that this

method has been adopted in the Grow More Food campaign. An alternative procedure would be for advances to be made by Land Mortgage Banks. Indeed this method would possess certain advantages over that of granting loans under the Land Improvement Loans Act. Land Mortgage Banks, however, have not made much progress and their number is very small, being about 200 in British India with a membership of approximately 100,000. In these circumstances loans by Land Mortgage Banks cannot take the place of advances under the Land Improvement Loans Act. Under the Grow More Food campaign large sums have been made available for takavi advances, and in view of the imperative need for a large extension of well-irrigation we are of opinion that this policy should be continued as a long-term measure.

A feature of the schemes initiated under the Grow More Food campaign has been the sanction, in addition to takavi advances, of grants-in-aid equal to one-fifth (one-fourth in one province) of the cost of the work subject to a maximum. The question is: should this system of grants-in-aid be continued as a long-term measure? As regards precarious tracts we think it should and such a policy would be in accordance with the recommendation of the Irrigation Commission. In regard to other areas we suggest that the position should be reviewed, after experience has been gained of the working of the schemes now in operation under the Grow More Food campaign, and a decision taken in the light of that experience whether in these areas this special stimulus is necessary.

We understand that grants-in-aid, under the Grow More Food schemes, are given in all cases irrespective of the financial resources of the grantees. A plan of a grant-in-aid for every well has the merit of simplicity and it avoids the difficulty of determining the resources of the grantee. But as against these advantages it involves the payment of grants to persons of ample means who would construct wells without Government aid. Funds for grants-in-aid are not and will not be unlimited and we would prefer that a simple means test should be applied with the object of eliminating persons of sufficient means from this concession.

It is particularly important that the rate of interest charged on loans should be kept as low as possible. We think that the loans should not be a source of profit to the State and that the surcharge, over and above the rate of interest payable by the State on its borrowings, should be reduced to an amount sufficient merely to cover the risks taken. We do not favour interest-free loans or a rate of interest lower than that fixed in the manner we have suggested.

12. Tanks in many parts of India form an important source of irrigation and we believe there is considerable scope for extending works of this character. What we have said about wells applies in large measure to tanks. The special staff we have suggested for well-irrigation would be able to advise and assist the landholder

in improving and constructing tanks, and *takavi* advances and grants-in-aid should be available for the purpose of stimulating the improvement and construction of tanks as well as of wells.

WATERLOGGING IN IRRIGATED AREAS AND REPAIR OF PRIVATE IRRIGATION WORKS

13. There are two matters to which our attention has been drawn by the replies to our questionnaire. They are these. First, waterlogging in the irrigated areas of the Punjab, and secondly, the state of disrepair of private irrigation works in the permanently settled areas of Bengal, Bihar, and Madras. Waterlogging in the irrigated areas of the Punjab has become a very serious matter. It is due to the rise of the water table and the harmful effects of this rise appear in two forms. First, the saturation of the soil, locally known as *sem*, or, in the worst affected areas, the appearance of water on the surface and the formation of *jheels;* and secondly, the concentration of salts in the upper layers of the soil, locally known as *thur*. The seriousness of the situation may be judged from the fact that whereas in 1932 the areas seriously affected by *sem* and *thur* were 26,000 and 300,000 acres respectively, they now amount to 34,000 and 1·4 million acres. In addition, there are large areas which are affected to a less extent. We have been informed that tube-well pumping, coupled with adequate surface drainage of storm water, seems to be the most promising method of controlling the level of the water table, and that the Punjab Government have under consideration a large scheme of tubewell development along the perennial channels of the Chaj and Rechna Doabs. It is hoped that with the completion of this scheme there will be considerable improvement in the waterlogging situation. We understand, too, that the possibility is being examined of expanding irrigation on the canal systems affected, by utilizing the subsoil water pumped from the tubewells to be installed under this scheme. It is estimated that an additional 700,000 acres could thereby be irrigated. The problem of waterlogging is certainly one of the most serious which faces irrigation engineers in the Punjab. We trust that it will not become such an evil in the large irrigated areas of Sind.

The problem of restoring private irrigation systems to a state of repair in the provinces of Bengal, Bihar and Madras is one which presents great difficulty. In the southern districts of Bihar private irrigation systems have fallen into disrepair and have become almost useless. In the western districts of Bengal the position is the same. The Bengal Government have told us that there are great possibilities in the district of Bankura for an increase in the acreage under *rabi* crops, such as sugarcane, wheat, barley and winter vegetables, if the canals belonging to zamindars are improved; that the acreage under crops may also be increased in the district of Burdwan if the derelict tanks and other sources of irrigation belonging to zamindars are kept in repair; and that if derelict tanks in the district of Birbhum are excavated they would command 800 square miles or two-thirds of the net cropped area.

The Madras Government have also informed us that in many estates, governed by the Madras Estates Land Act of 1908, irrigation works are in a bad state of repair, with the result that a considerable extent of land is either left waste or fails to yield the maximum return. In Bengal, legislation (the Bengal Tanks Improvement Act) was passed in 1939 enabling Government to take over and improve derelict tanks, and since 1941, 700 tanks have been improved in the district of Birbhum. In Madras the problem is being dealt with under the provisions of the Madras Irrigation Works (Repairs, Improvement and Construction) Act of 1943. This Act authorizes Government to repair or improve any existing irrigation work in private ownership, or to construct a new irrigation work on land which is not Government property. The cost of repairing, improving or constructing the irrigation work is met by Government in the first instance and later recovered from the proprietor of the estate. In Bihar, under the Private Irrigation Act of 1922, the Collector of the district is empowered to direct that repairs be carried out, or alternatively to have the repairs carried out and to recover the cost from the proprietor or proprietors. We understand, however, that action taken under this Act has been limited and that little progress has been achieved in putting private works into a state of repair. The proper maintenance of private irrigation works is a matter of importance and we suggest that it is one which calls for the strict enforcement of the legislative measures passed with the object of ensuring it.

Conservation of Rain water and Prevention of Soil Erosion

14. In certain areas, particularly in the undulating country of the Deccan, although the rainfall is precarious, the monsoon is often marked by heavy downpours of rain of short duration. These heavy rain storms, while of little value for the cultivation of crops, cause serious soil erosion by washing down the fertile upper layers of the soil from the sloping hill sides to lower ground and into *nullahs* and rivers. The twin problems of the conservation of rain water and the prevention of soil erosion have been under examination by the Agricultural Department of the Government of Bombay, for over a decade, in connexion with investigations into the application of dry-farming methods in large tracts of low and uncertain rainfall in the Bombay Presidency. At an early stage in the investigation in the districts of Sholapur and Bijapur, it became clear that some sort of bunding (embankments) is essential in order to achieve the dual object of the prevention of soil erosion and the conservation of rain water. The construction of such embankments is not in itself a new development in these areas, for a considerable number of such embankments have been erected by cultivators on their own initiative and at their own expense. The great majority, however, are earthworks of considerable size, constructed at the lower ends of large fields, and in many cases provided with masonry waste weirs for the escape of the large quantity of excess rain water which flows down

from the upper slopes. Embankments of this kind are of the nature of "flooding" schemes, and the majority are constructed without reference to their effect on neighbouring lands, and with little or no relation to the general contour of the surrounding area. Moreover they are expensive to erect and maintain and in periods of heavy and concentrated rainfall frequently give way under the pressure of accumulated surface water. When breaches occur the rush of water causes great damage to the fields lower down.

In 1943 the Government of Bombay sanctioned a large-scale experiment in contour bunding in the districts of Sholapur and Bijapur in connexion with famine relief operations then in progress in those districts. The experiment consisted of large-scale investigations into the technical aspects of contour bunding, namely, the height and width of bunds, the maximum distance between adjacent bunds, and the most economical methods of construction. This work was commenced in April 1943 and by the end of March 1944 work had been completed in an area of over 120,000 acres, consisting of 30,000 acres of uncultivated land and 90,000 acres of cultivated land. The uncultivated area was contour trenched and the trenches sown with seeds of forest trees with the object of afforesting the area. In the remaining area contour bunding was carried out. The result of this large-scale experiment was considered to be sufficiently satisfactory to warrant contour bunding to be proceeded with on a larger scale, and the Government of Bombay sanctioned the contour bunding of an area of 300,000 acres at a cost of Rs. 12 per acre, of which the cultivator will pay Rs. 9 in instalments spread over a period of fourteen years.

The system of afforestation by contour trenching, and the conservation of rain water in the cultivated land by means of contour bunding, holds out the prospect of effecting great improvements in the agricultural conditions of large areas in Bombay and other parts of India, where the rainfall is not only precarious but is liable to be precipitated in violent storms of short duration. We commend the work in Bombay to the notice of other Provincial and State Governments.

Multi-purpose Reservoirs

15. In paragraphs 7 and 10 we referred to the important part which cheap power, chiefly hydro-electric power, can play in the development of irrigation in India. Water for irrigation can be obtained from three sources. First, the normal flow of rivers; secondly, surface storage reservoirs; and thirdly, sub-soil supplies. We understand that the first source, which provides the cheapest form of irrigation, has, in some areas, been almost fully exploited, and that in the future, irrigation schemes will depend to an ever-increasing extent, on the second and third sources. Storage reservoirs are, however, expensive to build and the pumping of water from the sub-soil is costly in the absence of cheap power. But storage reservoirs can be used for other purposes besides irrigation, namely, for the prevention of floods, for the maintenance

of navigation and for the generation of hydro-electric power on a large scale at cheap rates. We have been informed that the development of these multi-purpose reservoirs is one of the most hopeful methods of improving the rural areas of India. The water from the reservoir can be used for irrigation, thereby increasing the yield of the crops on land already cultivated and bringing new land under cultivation. Flooding can be prevented and not only crops saved from damage by flood water but also land, which would otherwise remain uncultivated, brought under the plough. The electricity can be used in pumping from tube-wells and deep-set rivers, and irrigation thereby provided for land which cannot be irrigated directly from the reservoir. Cheap power can be provided for industrial development thus relieving the pressure of the population on agricultural land.

Central Waterways Commission and Central Technical Power Board.

16. In order to assist planned development on these cognate lines the Government of India have recently constituted a Central Waterways, Irrigation and Navigation Commission under the chairmanship of the Consulting Engineer, Waterways, Irrigation and Navigation to the Government of India. The Commission will act as a central fact-finding, planning and co-ordinating organization and will be available to advise Central, Provincial, and State Governments in regard to waterways, irrigation and navigation problems throughout the country. It will be a strong technical organization designed to conduct, where necessary, surveys and investigations, with a view to secure the planned utilization of water resources of the country as a whole, and in consultation with Provincial and State Governments to co-ordinate and press forward schemes for the conservation, control and regulation of water and waterways. A Central Technical Power Board has also been formed. This Board will similarly act as a central planning organization and will be available to advise the Central, Provincial and State Governments in regard to the policy of encouraging and planning widespread development of public electric supplies throughout the country. Like the Waterways Commission, the Central Technical Power Board will be a strong technical organization designed to collect information, conduct surveys and prepare schemes in outline for electrical development in consultation with Provincial and State Governments. We hope that with the assistance of these two bodies, whose functions appear to be so closely connected, Provincial and State Governments will be able to undertake schemes which will increase greatly the productivity of rural areas.

17. In the opening paragraph of this chapter, we said that among the measures which can be taken to increase the area under cultivation and the yield of crops on land already under cultivation, first place must be assigned to works for the supply and

conservation of water. In the succeeding paragraphs we have reviewed different measures which can be taken to ensure the better supply and conservation of water. In conclusion we wish to say this. The problem of water-supply will not be solved by the mere extended application of one particular method of irrigation but by the use of all methods. We consider it of vital importance that all methods should be actively developed, and that Government and the people should recognize, that irrigation in its widest sense is the most potent means of increasing agricultural outturn in India. Irrigation canals, multi-purpose reservoirs, tubewells, river pumping, open wells, tanks, private irrigation works in permanently settled areas and the conservation of rain water by contour bunding must all be developed to the utmost extent if agricultural production is to keep pace with the growth of population in India.

Summary of Conclusions and Recommendations

18. Our main conclusions and recommendations may be summarized as follows:—

(i) Among the measures which may be adopted for increasing the area under cultivation and the yield of crops on land already under cultivation, the first place must be assigned to the supply and conservation of water.

(ii) The construction by Government of all classes of irrigation works such as canals, multi-purpose reservoirs, tubewells and river pumping plant, should be undertaken as rapidly as possible in the post-war period.

(iii) In estimating the financial soundness of an irrigation scheme account should be taken not only of the revenue directly attributable to the work in question, but also of the additional revenue indirectly accruing to Government as a result of the increase in the wealth of the population. An irrigation scheme promotes the well-being and the standard of living of the people and there is, therefore, nothing intrinsically unsound in general revenues contributing to the loan charges of well considered schemes.

(iv) The State should encourage the development of private wells by the collection of full information as regards sub-soil water-supplies, the appointment of a special staff charged with the duty of advising and assisting the villager in the sinking of wells, the grant of takavi advances and the introduction of more efficient means of lifting water, especially in tracts with a deep water table.

(v) The construction of private tanks should also be encouraged.

(vi) The legislative measures passed for the purpose of ensuring the proper maintenance of private irrigation works should be strictly enforced.

(vii) The system of afforestation by contour trenching and the conservation of rain water by contour bunding holds out the prospect of effecting great improvements in agricultural conditions in large areas in Bombay and other parts of India, where the rainfall is not only precarious but is liable to be precipitated in violent storms of short duration. The work being carried out by the Bombay Government in this regard is commended to the notice of other Provincial and State Governments.

CHAPTER II.—MANURE

Next to the provision of an assured supply of water, the use of manure offers the most important single means of increasing the yield of crops. Experience has shown that the plant food, abstracted by low yielding varieties of crops, is replaced through the operation of the natural recuperative powers of the soil, assisted by the small quantity of manure occasionally applied, and that the fertility of the soils of India has thus become stabilized at a low level. If, therefore, the yield of crops is to be increased and in particular if the full benefit is to be derived from improved varieties, plant food must be added to the soil in very considerable quantities. Hitherto the use of manures has been confined largely to the more profitable among the cash crops, such as tobacco, sugarcane and vegetables, and the amount of manure applied to land on which the main crops are grown has been very small. The problem of increasing the amount of manure used is, however, not a single problem but a whole series of problems, none of which is easy of solution. Yet, if the standard of living of the Indian cultivator is to be raised, it is essential that the use of organic and inorganic manures should be greatly extended. If this is to be achieved, every source of fertilizing material must be utilized to the fullest extent, the supply and distribution of manures and fertilizers must be so organized as to ensure that they are available in all parts of the country at the cheapest possible rates, cultivators must be educated in their use and Agricultural Departments must be in a position to give detailed advice as to the quantity and the manner in which they should be applied.

2. The manurial problem in India, is in the main, that of a deficiency of nitrogen in the soil, though, in parts of the crystalline tracts of peninsular India, phosphates are also needed. The aggregate requirements of nitrogenous manures are enormous. One estimate has put them at 2·6 million tone of fixed nitrogen a year. [1] It has also been estimated that even if the whole of the farmyard manure were used for manuring the land—at present only about 40 per cent is believed to be so used—the amount of nitrogen thus made available would only be in the region of 800,000 tons, that is, about one-third of the total requirements. [2] These figures show the magnitude of the manurial problem which has to be solved, if the technological possibilities of increasing the yield of crops by means of manure are to be translated into practical possibilities.

3. The principal forms in which nitrogenous manures can be made available in India are (*a*) farmyard manure, (*b*) compost made

[1] Burns' Technological Possibilities of Agricultural Development in India, page 122.

[2] Memo. on the Development of Agriculture and Animal Husbandry in India of the Advisory Board of the Imperial Council of Agricultural Research, page 7.

from night-soil and refuse in urban areas, (*c*) compost made from village refuse and other materials, (*d*) oil cake, (*e*) green manure, (*f*) bone meal, fish manure, etc., and (*g*) chemical fertilizers.

Farmyard Manure.

4. The value of farmyard manure lies not only in the nitrogen but also in the humus it provides. It has been estimated that only 40 per cent of what is produced is used as manure, that another 40 per cent is used as fuel, and that the remaining 20 per cent is lost owing to difficulties of collection. The cultivator fully realizes the value of farmyard manure for the purpose of increasing the yield of his crops. The problem does not, therefore, consist in convincing him that cattle dung is better used as manure than as fuel, but in providing him with an alternative fuel, as cheap and as useful as cattle dung. Until such a fuel is available the practice of using cattle dung as fuel will continue, and no amount of propaganda directed against the practice will materially reduce the amount so used. In some parts of India, but not in others, wood is a possible alternative fuel. This is the case in areas where there are tracts or parcels of land, which are only capable of producing trees, and in these areas the establishment of fuel plantations is perhaps the most hopeful method of reducing the amount of cattle dung used as fuel. In other areas the planting of shrubs as hedges or wind breaks and of quick growing trees near the villages may assist, but in the most highly cultivated, and, therefore, the most densely populated areas, the growing of fuel trees on any considerable scale is generally not feasible. Some crops, such as cotton and jute, provide fuel and in determining the rotation of crops fuel requirements should be kept in view. Another possibility is the extended use of mineral oil as a fuel for cooking and the feasibility of popularizing the use of this fuel in the post-war period needs examination. The use of electricity for cooking is a more remote possibility, but we suggest that its use should be explored in areas where cheap electrical power is available, or is likely to be available, under the hydro-electric schemes proposed to be carried out after the war. Further, the increased use of hydro-electric power by industries and railways may release coal and other fuel for domestic use. We recognize that there is little new in these suggestions but no other lines of advance appear possible. We would, however, suggest that more might be accomplished if an attack on the problem were concentrated within relatively small areas in each province. In one area the planting of quick-growing trees, whether singly or in plantations, might be carried out with the assistance and under the guidance of an officer specially stationed in the area for the purpose. It would be his business to explain to the villagers the need for using wood in place of cattle dung as fuel and to encourage the planting of fuel trees. In another area an endeavour might be made to increase the use of oil fuel for cooking purposes. This would have to be done by actual demonstration and by lending out oil stoves to those villagers who were prepared to make the experiment. If success is to

be achieved it will be through ocular demonstration in the villages and not through the circulation of printed pamphlets or by talks advocating the use of a particular kind of fuel.

Compost

5. The manufacture of compost from night-soil and town refuse has made progress under the action taken by the Central and Provincial Governments during the Grow More Food campaign. Considerable quantities of this manure have been produced and a certain amount has been distributed. Although it is yet too early to say whether the development of this source of manure will prove a success, the outlook is promising. Difficulties have, however, been experienced in some quarters owing to the objection of the cultivator to handle manure made out of night-soil. Transport is also a difficulty for villagers have not the facilities for transporting it over long distances. If this scheme is finally successful, a valuable addition will have been secured to the total amount of organic manure available.

6. The making of compost from village refuse, cane trash, water hyacinth and other material available in the countryside presents more difficulty. The amount of labour involved is very considerable and if weeds like water hyacinth are used, there is the danger of spreading the pest. Still no source of fertilizing material can be neglected, and experimental work should continue with a view to ascertaining the best methods of composting under rural and village conditions. If, for instance, it should be possible to make a good compost out of water hyacinth, a double purpose would be served—a valuable manure would be obtained and a noxious weed destroyed. Particular attention should also be given to the conservation of cattle urine.

Oil cake

7. Another source of nitrogen is oil cake. With the exception of castor and *neem* cake, oil cake is used as cattle feed; in fact this is the principal use of oil cake in India. The amount at present consumed as cattle feed is only a fraction of what it should be if the cattle were properly fed. Any increase in the production of oil cake will, therefore, be largely absorbed as cattle feed and it is unlikely that any considerable expansion in the use of oil cake as manure can be expected. It is, however, desirable that as much as possible of the oil seeds grown in India should be crushed in India, so that the maximum amount of oil cake may be available for cattle feed and manure. This is a matter to which we attach particular importance and we suggest that it be examined.

Green manuring

8. Green manuring is another subject which requires further investigation. Experiments have shown that provided there is sufficient water, after the green manure has been ploughed in, to enable it to rot properly, and that there is, except in the case of transplanted paddy, a sufficiently long gap (at least six weeks)

between the ploughing in and the sowing of the next crop, green manuring results in improved yields. Green manuring has, however, made little progress except in the rice-growing areas of the deltas in Madras. One of the chief reasons for the lack of progress is probably to be found in the fact, that the small cultivator cannot afford to sacrifice even a catch crop in order to grow a crop for green manuring. *A priori* it would appear that green manuring will only be successful in places, where there is an abundant supply of water and the pressure of population on the land is not heavy, or the green manure crop fits into, or is a part of, the normal rotation of crops. As we have said the question of green manuring requires further investigation and we recommend this be undertaken without delay.

Bone Meal and Fish Manure

9. Bone meal and fish manure are valuable sources of nitrogen and phosphates and the former is particularly valuable for soils deficient in calcium. The quantities of these manures produced, however, are very small and before the war much of what was produced was exported. Again, only a small proportion of the bones available is collected. The Royal Commission on Agriculture recommended that Government should investigate the cost of processing bones with special reference to those districts, in which the development of hydro-electric schemes gives promise of the supply of cheap power. We draw attention to this recommendation and suggest that investigation be undertaken in those areas where hydro-electric power has been developed during the last decade. With the development of the fish industry in the post-war period the quantity of fish manure should increase considerably. Every measure should be taken to encourage the use of this valuable fertilizer. The utilization as manure of offal and blood from slaughter-houses and meat dehydration factories is another matter which might be investigated.

Artificial Fertilizers

10. Finally, we come to artificial fertilizers of which the most important is ammonium sulphate. In view of the great difficulty, indeed, the impracticability of supplying the potential manure requirements of India by means of organic manures, i.e., farm-yard manure, compost, oil cake, green manure, bone meal and fish manure, the use of artificial fertilizers becomes a matter of great importance. We have been told that the potential demand for ammonium sulphate for crops such as sugarcane, potatoes, vegetables, rice and wheat grown on irrigated land is in the region of three million tons a year. Before the war the total imports of ammonium sulphate amounted to about 100,000 tons and the amount manufactured in the country was approximately 20,000 tons, but the greater part was used for special crops including plantation crops, only about 15,000 tons being used for the manuring of paddy. The Foodgrains Policy Committee recommended that arrangements should be made for the setting up in India of a plant

capable of manufacturing 350,000 tons of ammonium sulphate per year. This proposal has been examined by a Technical Mission and on the basis of its report the Government of India have decided to establish a factory capable of producing this quantity of sulphate of ammonia. It is, however, unlikely that the plant will come into production before the end of 1947 and until that time it appears improbable that the amount of ammonium sulphate available for consumption in India will reach a yearly total much in excess of 250,000 tons. We, further, understand that another factory capable of manufacturing 100,000 tons a year is under construction in Travancore. These figures illustrate the wide gap between the technological possibilities of increasing the yield of crops by the use of artificial fertilizers and the practical possibilities of the use of such manure. It is inevitable that, apart from the actual amount of artificial fertilizers available, progress in the use of these fertilizers will be gradual—the cultivator will have to be educated in their use—and that it will be many years before consumption is equal to potential requirements.

In 1928, the Royal Commission on Agriculture expressed the view that " with certain exceptions, however, such as for instance, sugarcane and the more valuable garden crops, it is yet to be determined for what conditions and for what crops artificial manures can be profitably used to stimulate crop production in India." Considerable progress has been made during the last 16 years, and the Agricultural Departments are now in a better position to give definite advice in regard to the use of chemical fertilizers for paddy and irrigated wheat. In other respects, however, the position today is the same as it was when the Royal Commission reported. Further, even as regards rice and irrigated wheat, the Agricultural Departments are not in a position to give full detailed advice. For instance, little information is available as to the most suitable time for the application of the fertilizers, about the correct proportions of nitrogen, phosphorous and potassium for different soils and crops, and the proportion in which organic manure should be used along with fertilizers. In fact considerably more research and experiment are required in regard to the use of fertilizers before the Agricultural Departments will be in a position to give full and satisfactory advice as regards their use.

There is one other point to which attention should be drawn. The results given by fertilizers depend largely on the amount of moisture in the soil. In regions where the rainfall is light and the land is not adequately irrigated, artificial fertilizers usually fail and even organic manures are uncertain in their action. Throughout large areas in India, therefore, fertilizers cannot be used profitably unless the land is irrigated.

Other Sources of increasing Plant Food

11. There are two sources of increasing plant food to which we suggest insufficient attention has been paid in the past. The first is the adoption of measures for promoting the natural recuperative powers of the soil through the activity of micro-organisms

in the soil, or by other means. This, however, is an extremely intricate problem and we are unable to say, in the present state of knowledge, to what extent supplies of plant food can be augmented by these means, but we recommend that further research should be undertaken in this matter by agronomists, chemists and microbiologists. The second is the introduction of crop rotations in order to increase the productivity of the soil, and the examination of current practices with a view to determining which of the leguminous crops can be most profitably introduced in such rotations.

Prices of Manures

12. The price factor is a most important element in the use of both organic and inorganic manures. The financial gain to the cultivator must be substantial; it is not sufficient that there should be some gain. If the gain is small it is certain that the cultivator, particularly the small cultivator, will refuse to go to the expense of buying the manure and take the trouble of applying it to the land. In the present abnormal situation the use of oil-cake and compost made from night-soil and town refuse for the production of foodgrains is being encouraged by subsidization. In the existing emergency we see no objection to this, but we cannot recommend that manures should continue to be sold at concession rates on the return to normal conditions. That does not mean, of course, that Government should take no measures to ensure that the prices at which manures and fertilizers are sold to the cultivators are as low as possible. There are several ways in which Government can come to the assistance of the cultivator. First, railway freights should be periodically reviewed with the object of determining whether further concessions in freights are possible. As the Royal Commission on Agriculture pointed out, any increase in the crop yield, as a result of the use of manures and fertilizers, must eventually lead to an increase in traffic and thus benefit railway revenues. Secondly, the quality of manures and fertilizers supplied by the trade should be kept under close watch to guard against adulteration. Thirdly, Government should, if necessary, arrange, preferably through co-operative societies, for the distribution of manures and fertilizers. And fourthly, co-operative credit societies should be organized, in those areas where they do not now exist, with a view to financing the small cultivator in the purchase of manures and fertilizers.

Summary of Conclusions and Recommendations

13. A great increase in the use of manures and fertilizers is one of the most urgent requirements of Indian agriculture. We do not, however, expect a spectacular change within a year or two; the difficulties are too formidable to permit of that happening. But what we do look forward to is a gradual and substantial increase in the yield of crops due to the use of manure. Our main recommendations are—

(i) Efforts to find an alternative fuel to cattle-dung should be continued and intensified.

(ii) The making of compost from night-soil and town refuse should be continued and expanded.

(iii) Investigations into the best methods of making compost from village refuse, cane trash, water hyacinth and other materials available in the countryside, and the conservation of cattle urine should be continued and intensified.

(iv) The question of crushing in India of as large a proportion as possible of the oilseeds grown in the country should be investigated.

(v) Further investigations into green manuring are necessary.

(vi) The extended use of bone-meal and fish-manure also needs examination.

(vii) An expansion in the use of artificial fertilizers is essential if the yield of crops is to be substantially increased. The use of these fertilizers is, however, a technical subject on which fuller information is required. Further research and experiment are necessary in order that Agricultural Departments may be in a position to give full advice as regards the use of these fertilizers.

(viii) The price factor is a most important element in the use of organic and inorganic manures. While we do not recommend that the use of manures should be subsidized, we suggest that the State should take other measures with a view to ensuring that manures are available to the cultivator at as low a price as possible.

CHAPTER III.—IMPROVED VARIETIES

Evolution of Improved Varieties

The evolution of improved strains of crops through selection, hibridization, and the introduction and acclimatization of foreign types has been rightly recognized by the Departments of Agriculture in India as a fruitful method of increasing production, and considerable success has been achieved in this direction. It is estimated that an increase in production of from 5 to 10 per cent can be obtained from improved varieties. It is in this field that the cultivator, once convinced of the advantage, has shown greater readiness than in any other to follow the advice of the Departments of Agriculture. By 1926–27 when the Royal Commission on Agriculture held their inquiry considerable areas under some of the main crops were sown with improved varieties. Further work to obtain better strains has continued in the provinces and at the Imperial Agricultural Research Institute. The Imperial Council of Agricultural Research has, from its very inception, encouraged this line of investigation throughout India; in fact this may be regarded as the main activity of the Council. Sir John Russell (1937) considered the work on improved varieties as "indeed some of the best agricultural work in India." Perhaps the most marked achievement has been the production of improved varieties of sugarcane at Coimbatore. Their rapid spread, within a short time, is a testimony to their high value.

2. The Departments of Agriculture now have improved strains of practically all cereal crops, suited for different regions, and further work towards improvement is well in hand. Improved strains of edible and other oil-seeds—rape, mustard, groundnut, sesamum, linseed and castor—are also available. Of the pulses, gram has received some attention and certain high yielding and wilt-resistant types have been produced. Pigeon pea (*Cajanus indicus*) has been under investigation, and attempts are being made to obtain wilt-resistant types. Until recently other pulses did not receive much attention, but at the suggestion of Sir John Russell co-ordinated schemes of breeding improved varieties have been started in provinces and states by the Imperial Council of Agricultural Research. The importance of pulses in providing much-needed protein food, good feed and fodder for cattle, and in adding nitrogen to the oil through the agency of bacteria must be strongly emphasized. The Indian Central Cotton Committee and the Indian Jute Committee have initiated schemes for producing improved types of the fibres with which they are respectively concerned. Work is also being done on tobacco.

In the beginning, the work of improvement was confined to increasing the yield of crops, and to improvement in quality in the case of fibres, oil-seeds and tobacco; later, attention was directed to the evolution of varieties which could resist

pests, diseases and other abnormal factors. The work of breeding better varieties of crops must continue, with a view to effecting further improvement in yield and quality and producing new resistant varieties. The latter are important because pests are liable to change their food habits, new strains of disease-producing organisms continually appear and resistance sometimes breaks down under different environments. Moreover, deterioration as the result of admixture, cross-fertilization and other cause necessitates the constant revival of strains.

Spread and Improved Varieties

3. The Royal Commission on Agriculture gave figures for the area under improved varieties of crops for 1926–27 (extracted from the Review of Agricultural Operations in India for 1926–27). We have obtained a statement of the position in 1938–39 from the same source[1] and these data are compared in the statement below. The Royal Commission were of the opinion that the available estimates did not do full justice to the work of crop improvement, because the selected varieties of certain crops, such as wheat and cotton, were so generally grown in certain provinces, that the departmental statistics did not properly represent the extent to which improved varieties had spread. During the Grow More Food campaign special efforts have been made to increase the area under improved strains, and the present position, therefore, should be better than it was in 1938–39:—

Crop.	Estimated area under improved varieties (in millions of acres).		Estimated percentage of area under improved varieties.		Estimated increased yield per acre (in maunds)[2].	Estimated annual increased production by improved varieties. (In millions of maunds.)
	1926–27.	1938–39.	1926–27.	1938–39.	1938–39.	1938–39.
Rice	0·9	4·5	1·1	6·2	2	9·0 (paddy).
Wheat	2·9	7·9	11·9	22·4	2	15·8
Jowar	0·1	0·6[5]	0·5	1·1[5]	1	0·6
Groundnuts ..	0·4	0·6	10·3	6·7	1·75	1·05
Gram	0·1	0·2	0·8	1·6	1	0·2
Cotton[3]	3·6	6·5	22·7	27·5	0·5 (seed cotton).	3·2 (seed cotton).
Jute	0·5	1·6	13·1	50·2	2·2	3·5
Sugarcane[4] ..	0·2	2·1	7·2	68·2	200 (cane).	420 (cane).

[1] Review of Agriculture and Animal Husbandry in India, 1938–39, page 16.

[2] One maund equals 82·27 lb.

[3] Improvement in cotton lies more in improvement of the quality of the lint (staple) and the ginning percentage, than in yield per acre.

[4] Sir John Russell's Report on the Work of the Imperial Council of Agricultural Research 1937, page 12: "The improved varieties occupy a large proportion—no less than 74 per cent—of the area under sugarcane; this being a larger than any other crop; out of 4·14 million acres of sugarcane grown in British India in 1936–37, 3·07 millions are stated to be under improved varieties.

[5] Figures for all millets (jowar, bajra and ragi), but mainly jowar.

From the above statement the phenomenal spread of improved varieties of sugarcane stands out as a conspicuous achievement. Improved varieties of other cash crops, such as jute, cotton and tobacco have also shown increased popularity. In contrast the spread of improved seeds of foodgrains other than wheat, that is, millets (jowar, bajra, ragi), gram and rice, has shown insignificant progress.

Production and Multiplication of Improved Seed

4. In the introduction of improved strains of crops the first step is the evolution of suitable types by the botanist. After adequate trials on experimental farms and often on demonstration fields belonging to cultivators, the strains found suitable are multiplied. This multiplication is carried out on departmental seed farms, on Union Board farms in Bengal, and by registered and recognized growers. In the Punjab there are large departmental seed farms ranging in area from 500 acres to 3,000 acres. Grants of land ranging from 2,000 to 7,000 acres, have also been given to some persons for cultivation, one of the conditions of the grant being that they should undertake the multiplication of departmental approved seed. During all stages of multiplication the fields are regularly examined and rogued, and the crop is cut, thrashed and stored under proper supervision to ensure the purity of the seed. In some provinces special facilities are given to the growers by the free supply of pure seed and the grant of small concessions in the form of *takavi* loans. Such growers are often called upon to enter into an agreement with Government to deliver to the Department of Agriculture all their produce for distribution. The seed is purchased by the Departments of Agriculture from growers, often at a premium, and distributed to the cultivator sometimes at concession rates [1].

Most provinces have evolved a suitable system for the periodical renewal of improved seed. The wheat seed scheme of the Punjab, started in 1930, provides a good model:—

(i) An adequate quantity of specially pure nucleus seed of the approved variety is produced every year under the supervision of the botanist.

(ii) This is radiated out for renewal at Government seed farms and large grantees' estates.

(iii) The seed produced is then distributed to the cultivator.

In this connection it is necessary to emphasize that improved seed should be within easy reach of the cultivator; it is essential that he should not have to travel long distances to obtain it. Machinery by which the whole process of production and distribution, that is, the production of nucleus seed, its multiplication

[1] At the suggestion of Sir John Russell, the Imperial Council of Agricultural Research made inquiries from the provinces and states concerning their methods of seed distribution and a publication, "Methods of Seed Distribution in India" 1940, has been issued.

under carefully controlled conditions through various stages and its final distribution to the cultivator, becomes a well regulated procedure, would greatly assist in popularizing improved varieties, and is recommended for adoption by all provinces. When such a system has been established and the confidence of the cultivator has been won, the necessity for demonstration and propaganda will disappear. It must be recognized that the State undertakes a great responsibility in providing seed to the cultivator. The failure of such seed would have serious repercussions. The utmost care, therefore, must be taken to supply to the cultivator seed of the highest quality.

Time required to cover the entire area of a crop with improved seed.

5. In answer to our question as to the time it would take to cover the entire area under a cereal crop with improved seed, the answers received show that, given a suitable organization for the multiplication and distribution of seed, the entire area of a crop in most of the provinces could be put under improved strain in a period of five to ten years. Assam, however, has placed this period at 20 to 30 years for rice. It is evident that for such crops as jowar, bajra and ragi, where the seed rate is low and yield in relation to seed high, multiplication will be quicker and the period of spread shorter than in the case of rice, wheat and gram, where the seed rate in relation to yield is relatively high and seed multiplication, therefore, a slower process.

Number of Varieties of Crops.

6. Sir Albert Howard (1924) advocated that the number of improved varieties of a crop should be as few as possible. The Royal Commission on Agriculture also advised against an undue multiplication of new varieties. Under Indian conditions where the environmental factors are so variable and not under control, varieties with a wide range of adaptability are in the long run likely to prove more successful, than narrowly specialized types which are more exacting in their requirements of soil, water and climate. There is much confusion regarding the different varieties, and we recommend the adoption of a system of registration of all varieties of crops including vegetables and fruits, with a full description of their characteristic features. The task may be taken in hand by the Imperial Agricultural Research Institute.

Incentive for Spread of Improved Seed.

7. To our question as to whether any special measures are necessary to induce the cultivator to sow improved seed, we have received different replies. On the one hand, we have been told that high yields and better prices are in themselves adequate and no further incentive is necessary. On the other hand, the opinion is held that where the additional monetary return from increased production is small, the grower does not exhibit any

particular interest in the improved variety. Most provinces still recognize the necessity of demonstrating on a wide scale the efficiency of improved seed, preferably free of cost to the cultivator. It has also been suggested that the grant of *takavi* loans on a large scale for the purchase of improved seed and the sale of such seed at concessional rates are necessary to secure the increased use of improved seed. In addition, various other incentives are offered by different provinces. For instance, the cultivator's seed is exchanged for improved seed, prizes are offered for the largest area under improved seed, and a premium is paid for improved seed purchased by the Departments of Agriculture from the growers. It is unfortunate that after years of propaganda and demonstration, it should still be necessary to offer inducements to make the cultivator accept better strains of cereal crops. We feel that the position needs careful study.

We have referred to the fact that the largest increase in area under improved varieties has been in the case of cash crops, particularly sugarcane and jute and to a smaller extent cotton. The increase in the area under improved varieties of cereals has been slow, the highest being 22 per cent in the case of wheat. It has been suggested that one of the reasons for this slow progress in the case of cereals is a lack of facilities for seed multiplication and distribution. During the war, however, these facilities have been considerably increased. We deal below with the factors which, in our opinion, influence the farmer in using improved seed.

Spread of High-yielding Varieties and Standard of Cultivation

8. The Royal Commission on Agriculture dealt with the question of the deterioration of soil fertility, as a consequence of the removal of plant nutrients by the crops, year by year, without any replacement except through natural processes of recuperation or general farm practices[1]. They tentatively concluded that an overwhelming proportion of the agricultural land of India had long ago reached a condition of stabilization of soil fertility and that no further deterioration was likely to take place under existing conditions of cultivation. Another conclusion which they arrived at was: "There is justification for the view that improved varieties of crops require, for their fullest development, more liberal manurial treatment than those ordinarily grown." Dr. Burns considers that "it is probable that in most parts of India soil fertility is stabilized at a comparatively low level," and adds "there are, however, indications that improved varieties with their higher uptake of nutrients may depress this level still further[2]" If so, this is a matter of great importance. It may be argued that a more efficient strain,

[1] Report of the Royal Commission on Agriculture, 1928, pages 75, 76 and 123.

[2] Technological Possibilities of Agricultural Development in India by Dr. Burns, 1944 (page 121).

with, let us say, a better developed root system, may, for a year or so, obtain food from a larger area and thus give a higher yield. But, having removed food nutrients from the soil, it may not continue to do so. The cultivator then talks of a deterioration of the strain, whereas it is really a case of starvation. It is possible that in the conditions in which, for a long number of years, no attempt has been made to replace, to any effective degree, the plant food which is removed from the soil by crops, the introduction of a high-yielding variety may not result in any actual increase in yield. Or the continued cultivation of high yielding varieties, without adding to the soil the nutrients removed, may even cause a reduction in yield. It is also possible that the introduction of high yielding or improved varieties of cash crops, which bring a substantial monetary return to the cultivator, may induce him to divert his meagre manurial resources to such crops, at the expense of food crops. Opinion is not unanimous on these points. It is necessary to make a distinction between two types of improved varieties. In some crops, the improved types excel in certain specific qualities, and for this reason bring in a better monetary return to the cultivator. For instance, in cotton a longer staple, in tobacco, better flavour, and in oilseeds a high oil content, mean an increased monetary return from the crop for the same yield. These varieties may not take more nutrients from the soil than the varieties in which these valuable qualities have not been developed. Again, there may be varieties which produce the required product in greater quantities at the expense of such parts of the plant as have no market value, for example more fruit in relation to vegetative or woody parts. On the other hand, there may be varieties which give a higher yield and actually remove more nutrients from the soil. Such improved varieties would naturally deplete the soil of plant food at a quicker rate than the local strains, unless what is removed from the soil is replaced by some means. In any case, there is no doubt that a combination of water supply, manure, good cultivation, elimination of waste and efficient varieties of crops, can alone lead to increasingly profitable crop production. Therefore, isolated attempts to popularize high yielding varieties without making provision for other factors which contribute to improved cultivation, will not achieve the desired success. The case of sugarcane supports this view.

We have referred to the strikingly rapid spread of improved Coimbatore canes. During the twelve years 1926–27 to 1938–39 the area under improved varieties of cane increased from 0·2 million acres to 2·1 million acres, that is, ten and a half times, and the percentage of the area under improved varieties went up from 7·2 to 68·2 per cent. No other crop has shown the same progress. The reasons suggested for the success of Coimbatore varieties of sugarcane are their superior yield, better response to improved cultivation and greater resistance to adverse conditions, or, in other words, their wide range of adaptability.

The main reason, however, appears to be that sugarcane is a crop which is grown on the best land, is well-manured and is given the best cultivation; in these conditions higher yields from improved varieties are assured. This, however, does not apply to cereal crops to any marked extent. The history of sugarcane, therefore, lends further support to our conclusion that the spread of improved seed must go hand in hand with improved irrigation, increased soil fertility and better farming operations. The failure of an improved variety to produce the additional yield claimed for it often does harm to the cause of agricultural improvement. We have said above that given the necessary facilities it should be possible to cover the entire area under a crop with improved seed within a few years, but we are doubtful if such an attempt will prove fruitful unless it is possible to increase soil fertility and provide other conditions conducive to good growth to the required level. We feel that it will not be propaganda—not even demonstration—but measures adopted to improve the fertility of the soil which will make the high-yielding varieties of cereals popular with the cultivator. We, therefore, recommend that the work of producing improved varieties should continue and a co-ordinated effort made to improve soil fertility simultaneously with the spread of the seed of improved varieties.

Summary of Conclusions and Recommendations

9. Our conclusions and recommendations are as follows:—

(i) Although considerable progress has been made in the evolution of improved strains of crops, work on the breeding of better varieties must continue with a view to effecting further improvement in the yield and quality and producing new resistant types.

(ii) Most provinces have evolved a suitable system for the periodical renewal of improved seed. It is necessary, however, that the seed of improved varieties should be within easy reach of the cultivator and it is essential that he should not have to travel long distances to obtain it. The spread of improved varieties would be greatly assisted by the existence of a machinery by which the whole process of production and distribution, that is, the production of nucleus seed, its multiplication under carefully controlled conditions and its final distribution to the cultivator, became a well-regulated procedure.

(iii) New varieties with a wide range of adaptability are, in the long run, likely to prove more successful than narrowly specialized types.

(iv) There is much confusion regarding different varieties and support is given to the proposal for a system of registration of all varieties of crops, including fruits and vegetables.

(v) The introduction of improved varieties must be accompanied by measures directed to improve the fertility of the soil if the best results are to be achieved.

CHAPTER IV.—PROTECTION AGAINST PESTS AND DISEASES

While the Indian agriculturist is fairly efficient in general farming operations and will willingly undertake hard labour in carrying them out, he is ignorant of measures for the control of pests and diseases and will very often not take the simplest step to protect his crops from their ravages. The reason is that measures of crop protection are a recent introduction in the field of farming in India and have not been stabilized as routine operations. Further, very often the causal organism is so very small in size, in some cases microscopic, or so concealed at the time when successful operations can be taken against it, that the farmer cannot appreciate the significance of the measures advocated. He does not see the necessity of dressing healthy-looking seed with an evil-looking substance to save his future crop from smut; or of collecting and burning jowar stubble to destroy hibernating caterpillars, the pest of a crop which he will sow months later. It was only at the beginning of the present century that serious attempts to study diseases and pests of plants were made in this country and the knowledge gained has not penetrated down to the cultivator[1].

Damage caused by Diseases, Pests and Vermin

2. The normal recurring loss to crops in India from diseases, pests, vermin, etc., may, on a conservative basis, be placed at 10 per cent of the total produce. During sudden epidemics, however, the loss may be enormous, and in areas where diseases or pests have become endemic, profitable cultivation may become impossible. In exeedingly few instances have the losses due to sudden epidemics been investigated and computed. In such epidemics, every individual farmer suffers, the loss in outturn is distributed, and its aggregate extent is not fully realized. How serious such a calamity can be was brought home to us when investigating the causes of the Bengal famine. The fungus disease (*Helminthosporium*) was one of the major causes of the serious shortage of the *aman* crop of 1942–43, which was one of the principal causes of the famine. If the famine had not occurred, the widespread damage caused by this disease would not have been fully appreciated and would have been soon forgotten. Another recent instance of serious loss caused by a fungus disease is that due to the red-rot of sugarcane which reached its peak in 1938–39 in the white sugar belt of Northern India—Bihar and the United Provinces. The loss due to this disease came into prominence because the organized sugar industry was able to assess the total damage. In the badly affected areas, most of the

[1] For an account of the history of plant mycology and entomology in India, reference may be made to the Review of the work on crops and soils done under the auspices of the Imperial Council of Agricultural Research, 1936.

mills could only crush 33 per cent of their normal quantity. Instances of similar widespread damage due to insect attacks are not unknown. A locust swarm may devastate an entire countryside of all verdure and bring about famine. In 1905, the cotton crop in the Punjab failed because of an attack by the spotted bollworm. The fruit industry of the Kulu Valley and Kashmir was on the verge of extinction but for the timely discovery of the causes of the trouble—San Jose scale and woolly aphis—and effective measures of control. Against the animal pests, elephants, wild pigs, deer, jackals, monkeys, porcupines, rats, flying foxes, paroquets, crows and sparrows—and we would also include stray cattle and goats in the list—the farmer has to carry on a constant warfare. There are large tracts where cultivation has been abandoned because of the unsuccessful struggle against wild pig. Intensive cultivation creates conditions suitable for the growth of crops and it is exactly these conditions which are favourable to the spread of pests and diseases. Domestication, that is, the improvement of crops with specific objects in view, lowers their natural resistance and renders them more liable to attack by diseases and pests. If, therefore, the full benefits of irrigation, manuring and improved varieties are to be assured, effective action must be taken to deal with diseases, pests and vermin. Crop protection is an important factor in increased production.

Research

3. Much useful work on these problems has been done in India at the Imperial Agricultural Research Institute and the Provincial Research Institutes and the Imperial Council of Agricultural Research has financed various schemes of investigation. At the time of the visit of the Royal Commission on Agriculture, the entomological and mycological staff employed in the provinces was very small. The position, however, has improved and most of the provinces now have on their staffs trained entomologists and plant pathologists. Again, the Imperial Council of Agricultural Research has financed schemes of research into plant protection. Particular mention may be made of the Locust Research Scheme and the Wheat Rust Scheme. Finally, the Council has initiated schemes of research on an all-India basis in mycology and entomology. Much more, however, remains to be done, and we approve of the policy of the Imperial Council of Agricultural Research of associating with every scheme of crop improvement research in the control of pests and diseases.

Prevention and Control

4. Methods of dealing economically with some serious pests have been discovered and are in operation on a small scale. For instance, success has been achieved in dealing with the more important fruit pests such as San José scale by contact winter spraying; with Citrus Psylla, the mango hopper and aphides attacking various fruit trees by contact sprays or dusts; and with

the *tikka* disease of groundnut by spraying with Bordeaux mixture. Woolly aphis is controlled by the use of its parasite, *Aphelinus mali*, and the coconut caterpillar, *Nephantis serinopa*, by its parasites. *Icerya purchasi* has been checked by its predator *Rodolia*. Smut of wheat can be prevented by a simple solar heat treatment of the seed, and smut of jowar by seed dressing. Many of the fungus diseases of fruit trees are similarly controlled by direct methods such as spraying or dusting. Biological control of the serious weed, the prickly-pear, by the use of *Dactylopius* has been most successful. Investigations have shown that certain pests and diseases can be controlled by what are technically known as preventive measures. For instance, the blight diseases of gram and the earcockle disease of wheat can be prevented by seed treatment and proper field sanitation. Borers of jowar, maize and rice can be dealt with by the ' safe disposal ' of crop remnants. Such operations, however, must, if they are to be effective, be performed at the proper time and over large areas. This requires organized and co-operative effort. As an instance of the possibility of the control of a pest over a vast area, the effective control of the desert locust, during its present cycle, may be mentioned. After a preliminary investigation of the bionomics and distribution of this insect, conducted on an all-India basis by the Imperial Council of Agricultural Research, a warning organization has been set up and control measures taken on a co-operative basis under the guidance of the Imperial Entomologist. By the combined efforts of the Centre, the Provinces and the States, the present locust cycle has been controlled with a minimum loss to crops and at no great cost. This warfare against the locust has been conducted by such simple means as trenching and poison-baiting. Thus, under suitable guidance and with a proper organization, a serious pest has been controlled by undertaking very simple measures. Similar large scale operations should be possible against many other serious pests.

5. In general, the control of pests and diseases of fruits and vegetables—crops which give a high return and are not grown over extensive areas—can be effectively organized, but the control of pests of staple crops grown over large areas, such as rice, wheat jowar, cotton, sugarcane, etc., presents greater difficulties. Extensive demonstration campaigns have been carried out in certain parts of the country to deal with the bollworm of cotton by clean cultivation, that is, by uprooting the cotton stubble and destroying the alternative host plants of the pest during the critical period. Again, the suitability of the large scale use of light traps against *Amsacta* has been demonstrated. Such demonstrations, however, have not been followed by regular control operations over wide areas owing to the absence of an adequate field staff. Similarly, methods of control of such pests as the sugarcane *Pyrilla*, the rice bug, and the white fly of cotton, etc., are known, but suitable equipment for their application on a sufficiently large scale is not available. Power dusting and spraying machinery for the control of pests and diseases has not been employed in India

up to the present. Now that excellent insecticides, such as D.D.T. and 666 have been discovered, aeroplane dusting against pests of staple crops such as the sugarcane *Pyrilla*, the rice bug, the cotton jassid, and wheat aphides may be a practical proposition.

6. A stage has been reached when further progress in disease and pest control operations is hampered by the cost of fungicides, insecticides and fumigants, and appliances for dusting, spraying and fumigation. India depends entirely upon imported materials and these are expensive. The present cost of the appliances are also beyond the means of most cultivators and fruit growers. The need for cheap fungicides, etc., and appliances is great and we strongly recommend that the question of producing cheaper chemicals and appliances be investigated.

7. As we have stated, control measures, whether on a small or large scale, are at present undertaken by the staff of the Departments of Agriculture, either independently or with the co-operation of the cultivator, free of cost or at a nominal charge. The staff available for such tasks is very limited and is usually the same as that engaged in research and teaching. The field of their activity is, therefore, restricted, and damage from diseases and pests continues. It is most essential that an adequate special plant protection staff for observation and intelligence and large scale control operations should be available. No pest or disease appears in an epidemic form all at once. For a year or so it increases, then multiplies enormously and assumes serious proportions. A plant protection service charged with the duty of watching the progress of pests and diseases, would be in a position to take timely and effective preventive and control measures. The red-rot of sugarcane illustrates this point. This disease is carried by unhealthy *sets*. Further, it is an accumulative disease. Its presence in localized patches was observed in the United Provinces during 1935–36 and 1936–37. If an adequate plant protection organization had existed, this evil could have been dealt with in the early stages of its development and a widespread epidemic avoided at a comparatively small cost. The anti-red-rot campaigns which were conducted on a large scale in the United Provinces and Bihar after the disease had reached its peak, succeeded in stamping out the disease within two seasons, by replacing old canes by new and healthy ones and by undertaking field sanitation measures, but this was achieved only by a tremendous effort and at great cost. Similarly, it has been proved that sugarcane smut can be effectively controlled by systematic roguing and seed selection for three successive seasons. But without an organization even such a simple measure cannot be undertaken. Many fungus diseases of cereals can be controlled by seed treatment. This again requires simultaneous and organized action over large areas. We, therefore, strongly recommend the provision of a special staff for plant protection in every province.

8. There are some serious cosmopolitan pests which have so far defied attempts at economic control. We mention only one,

that is, termites. We do so because we are of the opinion that with the increased use of organic manure, compost, green manure, etc., the soil fauna is likely to increase and termites in particular, finding abundant organic food, may multiply and prove a serious menace. The termites problem, therefore, is likely to assume great importance and we recommend that it should receive special attention.

9. The introduction of pests into India is guarded against by an All-India Act—the Destructive Insects and Pests Act II of 1914—which lays down that all living plants must be fumigated at the port of entry. This is carried out by the Customs authorities. Under the present system all plants are subjected to a uniform treatment with the result that sometimes a pest escapes destruction or a plant is killed. Further no record is kept of the pests discovered in the consignments. What is required is a special quarantine service, consisting of trained personnel who will be able to carry out fumigation in a scientific manner and keep a record of the pests intercepted. We understand that a proposal for such a service is under consideration; we recommend and support it. It has been discovered that pests are also entering India across her land frontiers. The proposed quarantine service should deal with this problem also.

10. To effect quick and simultaneous action against pests and diseases, a certain amount of compulsion is necessary. The Royal Commission on Agriculture mentioned Madras as the only province which had passed an Agricultural Pests and Diseases Act. The position remains practically the same to-day. Legislation of this nature and its enforcement is a regular feature of plant protection in other countries. We recommend the introduction of legislation in all the provinces for the enforcement of essential preventive and control measures.

11. We have mentioned in paragraph 3 instances of the successful biological control of pests and weeds. In many other cases, however, this method has not, so far, achieved success. While agreeing with Sir John Russell that, generally speaking, the biological control of pests has only been successful either in islands or in regard to introduced pests on a continent, we are of the opinion that biological control is a line of investigation which should be pursued with the following objects:—

(i) The compilation of available information;

(ii) the introduction of foreign parasites;

(iii) the study of indigenous parasites for transfer from one part of the country to the other; and

(iv) the prevention of practices by which useful insects are destroyed, thus leading to an increase in certain pests, and the encouragement of practices which will favour the spread of useful parasites.

We understand that a proposal for a biological research station is under the consideration of the Imperial Council of Agricultural Research. We support this proposal.

So far, little attempt has been made to study methods of control of noxious birds and mammals, and no economic remedy has been found against parasitic plants, such as *striga*. Work on virus diseases is being financed by the Imperial Council of Agricultural Research, but we feel that the bacterial diseases of plants have not received adequate attention. Further, deficiency diseases and those due to adverse climatic factors are at present an almost unexplored field.

Loss during Storage

12. Another problem is the loss caused through the deterioration of food products, particularly foodgrains, during storage. At a minimum this loss can be put at 5 per cent of the total production. During the war this question of deterioration during storage has become one of still greater importance owing to the large quantities of grain handled by official agencies. As we have said in paragraph 17 of Chapter III of Part I, the problem is under examination by the Storage Directorate of the Food Department of the Government of India. An investigation into the same subject is also being conducted by the Imperial Council of Agricultural Research. We recommend that these investigations be pursued vigorously, for a substantial decrease in the loss during storage will increase considerably the food resources of the country.

Weeds.

13. Certain weeds are a serious menace to agricultural production in India. They not only reduce outturn but also drive large areas out of cultivation. Their control and ultimate eradication constitute one of the most difficult problems confronting Agricultural Departments in India.

Large areas in parts of the provinces of Bombay, the Central Provinces and Berar, Madras, and the United Provinces, and the States of Hyderabad and Mysore are infested with deep-rooted weeds, the most common of which are *kans* (*Saccharum sponteneum*), *hariali* (*Cynodon dactylon*) *and kundah* (*Ischaemum pilosum*). The loss in production due to these weeds is enormous; the land which is worst infested remains uncultivated, and in the less affected areas the outturn is greatly reduced. The evil appears to be spreading and the Grow More Food campaign has focussed attention on the urgent need for extensive remedial action. There is no doubt that the effective control of these weeds would be followed by a considerable increase in agricultural production. The depth to which the soil must be ploughed to exterminate these weeds varies; the average appears to be about 10 or 11 inches, though in some areas it is as much as 15 inches. Ploughing with bullocks affords no solution because the bullock plough is only effective up

to six or seven inches. Hand digging is effective but expensive and is not a practical proposition over large areas. Deep ploughing by means of tractors appears to be the only solution and the Royal Commission on Agriculture recommended that a thorough investigation should be undertaken into the economics of power cultivation for the reclamation of areas infested by these weeds. Valuable experimental work on their eradication by tractor ploughing was undertaken in 1930–33 by the Burma Shell Oil Storage and Distribution Company (India), Limited, in the Dharwar district of the Bombay Presidency and the Raichur district in Hyderabad (Deccan), and the results of this work are contained in Scientific Monograph No. 9 of the Imperial Council of Agricultural Research, 1935. These experiments provided a large amount of useful information, and since that time tractor ploughing for the eradication of these weeds has been carried on in certain areas on a limited scale. The matter is now receiving more attention and, as we have said in Chapter II of Part I of this Report, orders on behalf of Provincial and State Governments have been placed for 160 tractors for employment on land infested with these weeds. We trust that the work of these tractors will be successful and that when the supply position becomes easier it will be possible to take still further measures for the eradication of this pest.

14. Water hyacinth is another weed which is seriously interfering with the cultivation of land. This pest is most serious in Bengal and Assam where it is not only driving land out of cultivation, but is also completely blocking the smaller waterways and rendering the navigation of larger ones difficult. Up to the present, unfortunately, no effective measure has been discovered for the prevention of the spread of this weed and its ultimate eradication. A third dangerous weed is lantana and this has also so far baffled the attempts of man to bring it under control. We have no concrete proposal to make as regards the eradication of these weeds and can only suggest that investigation should be vigorously pursued.

Summary of Conclusions and Recommendations

15. The conclusions and recommendations in this chapter may be summarized as follows:—

(i) If the full benefits of irrigation, manuring and improved varieties are to be assured, effective action must be taken to deal with diseases, pests, vermin and weeds; crop protection is an important factor in increased production.

(ii) The present cost of fungicides, insecticides, and fumigants, and appliances for dusting, spraying, and fumigation is high and beyond the means of most cultivators and fruit growers. The need for cheap fungicides, etc. and appliances is great and it is recommended that the question of producing cheaper chemicals and appliances be investigated.

(iii) The control of pests of the staple crops such as rice, wheat, jowar, cotton, and sugarcane can only be achieved by

organized efforts over wide areas. The staff available for such control measures is very limited and it is proposed that a special plant protection staff should be employed in every province.

(iv) With the increased use of organic manures, compost and green manure, termites may multiply and prove a serious menace. It is recommended that the termites problem should receive special attention.

(v) Fumigation of plants arriving in India from abroad is at present carried out by the Customs authorities. It is recommended that this work should be entrusted to a special quarantine service consisting of trained personnel.

(vi) To ensure quick and simultaneous action against pests and diseases a certain amount of compulsion is necessary. It is recommended that legislation be introduced in all provinces for the purpose of enforcing the adoption of prevention and control measures.

(vii) It is suggested that the biological control of pests is a matter which requires further investigation and support is given to the proposal for the establishment of a biological research station.

(viii) Attention is drawn to the loss caused through the deterioration of foodgrains during storage. It is recommended that the investigations now being conducted by the Storage Directorate of the Food Department of the Government of India and by the Imperial Council of Agricultural Research, should be vigorously developed.

(ix) Stress is placed upon the need for the eradication of deep-rooted weeds such as *kans*, *hariali*, etc., by means of tractor ploughing.

(x) Attention is drawn to the harm which is being done to agriculture by water hyacinth and lantana, and it is suggested that investigations into the eradication of these two noxious weeds should be continued.

CHAPTER V.—AGRICULTURAL IMPLEMENTS AND MECHANIZATION

Agricultural Implements

The Royal Commission on Agriculture (1928) expressed the opinion that in India agricultural implements were on the whole well adapted to local conditions and the capacity of the draught cattle, and were light, portable, comparatively inexpensive, easily made and repaired and constructed of material readily available. They considered, however, that there was great scope for their improvement in the light of the modern knowledge of soil conditions, and expressed their disappointment that very little work had been done in that direction. The Imperial Council of Agricultural Research has not directed its attention to the improvement of agricultural implements. Isolated attempts by individual workers, agricultural engineers and others, have continued, but neither the scale of these attempts nor their results can be regarded as very satisfactory. Awards for improved implements, offered from time to time, have not produced any striking results. However, there has been some advance towards the evolution of more efficient implements such as iron ploughs, seed drills, harrows, cultivators, soil-scoopers, clod-crushers, ridgers, chaff-cutters, groundnut diggers and decorticators, turmeric polishing machines, maize shellers, etc. Attempts have also been made to evolve suitable threshers and winnowers. Iron persian wheels of various types, some with roller bearings, have come into use in certain parts of the country and bullock carts fitted with pneumatic tyres are seen in a few areas. The most popular of the improved implements are the light iron ploughs, chaff-cutters, iron sugarcane crushing mills and iron persian wheels. Improved sugarcane juice boiling furnaces have also been generally adopted. Although over the greater part of India the scope for improvement is limited by the low capacity of the bullock, we are of the opinion that there is room for further improvement. An illustrated account of the various implements and other farm equipment in use in India would be of assistance in the investigation of improved types and we suggest that such a catalogue be prepared. We also suggest that a collection of such implements and other equipment should be made and kept in a central "museum." Attempts which are made to evolve improved types in different parts of India are frequently undertaken without knowledge of what has been achieved in other parts of the country, and labour is sometimes wasted in covering the same ground twice over.

Mechanization of Agriculture

2. In India the draught animal is the bullock and an enormous number of bullocks is maintained for the purpose of cultivation. The total number of bullocks and uncastrated males over three

years of age, kept for work only, in British India, according to the cattle census of 1940 was 49 millions. This was almost equal to half the total adult bovine population. Both man and beast have to derive sustenance from the soil and, largely owing to the pressure of the human population on the land, the amount of food available for cattle is grossly insufficient. This is the main reason why efforts made to improve the quality of the livestock have achieved, on the whole, so little success. Again, as the bullock is essential for cultivation, it is better fed than the cow. As the Royal Commission on Agriculture observed, "broadly, it would be true to say that, if there is any fodder available after the draught cattle are fed, she (the cow) gets it or shares it with young stock; for the rest she is left to find food where she can!" The cow's poor diet affects her milk yield and her progeny. The former in its turn reduces the supply of a valuable protective food for human beings and the latter leads to inefficient cultivation. A reduction in the number of bullocks, by relieving pressure on food and fodder resources, will enable the remaining bullocks to be better fed and this will increase their efficiency. Again, the cow will obtain a larger share of the cattle food available. She also will be better fed and will, in consequence, produce more milk and better progeny. There is no danger of reduction in the amount of farmyard manure, for the quantity of fodder consumed will not be reduced. One of the urgent needs of India, therefore, is a reduction in the number of bullocks.

3. In many countries agriculture has been largely mechanized, and we take the view that having regard to the urgent need for a reduction in the number of bullocks in India, the possibility of replacing bullock by mechanical power is a matter which should receive the urgent attention of all administrations in the post-war period.[1] The mechanization of agriculture is usually associated with countries where agricultural labour is scarce and wages high. It is often urged that a country in which agricultural labour is cheap and plentiful is unsuited for mechanization, because the employment of machinery on the farm will increase unemployment. In Indian conditions, however, mechanization may serve a purpose very different from that which it serves, for instance, in the United States of America. A tractor does not derive its motive power from the produce of the soil, whereas a bullock does. By displacing, therefore, bullocks by machines more food will be available for feeding the cow. The cow will be better fed and there will be an increased supply of food for man.

4. Bullocks are employed not only for agricultural operations in the field, such as ploughing, harrowing, etc., but also for lifting water from wells, grinding corn and crushing oil seeds and sugarcane. For the latter operations mechanization has already

[1]. About 1920 there were 26 million horses and mules in the United States of America and by 1940 they were less than 16 millions. In 1919 there were 160,000 tractors, and by 1939 they had increased to 1,600,000. There was similar increase in other motor vehicles. This has meant a release of 35 million acres of land the production of which was required to support work stock. (Farmers in a Changing World—Year Book of Agriculture—United States of America 1940–41).

made a certain degree of progress in some parts of the country, and oil engines and electric motors, where cheap electric power is available, are being employed in increasing numbers. Various hydri-and thermal-electric grid schemes are projected for construction in the post-war period, and in areas where cheap electric power will be available there will be special scope for the replacement of bullocks by mechanical power in operations, ancillary to cultivation, of the nature mentioned above. In paragraph 9 of Chapter I on Irrigation we have already referred to the desirability of devising methods by which water lifts can be worked by mechanical power, and have suggested that a study of such methods should be carried out. We repeat that suggestion and further stress that all possible measures should be taken, e.g., by hiring out electric motors and providing an efficient maintenance and repair service, to encourage the use of mechanical instead of bullock power in the operations in question.

5. Up to the present the employment of tractors in farming in India has been limited to a few large estates growing cotton or sugarcane. In paragraph 13 of Chapter IV on "Protection against pests and diseases," we drew attention to the large areas in certain parts of India which are seriously infested with deep-rooted weeds, and pointed out that deep ploughing by tractors appears to be the only manner in which these weeds can be eradicated. As we said in that paragraph, several Provincial and State Governments have placed orders for a considerable number of tractors for work in these areas. Orders have also been placed by Provincial and State Governments for tractors for the purpose of bringing under cultivation land which, though culturable, is now uncultivated. The primary object of the employment of these tractors is the eradication of deep-rooted weeds and the breaking up of new land, but we suggest that these machines should also be utilized for conducting thorough investigations, in continuation of those carried out by the Burma Shell Oil Storage and Distribution Company in the years 1930–33, into the whole question of the substitution of mechanical for bullock power in farming operations.

For the eradication of deep-rooted weeds and the breaking up of new land, deep ploughing is essential and powerful tractors are, therefore, required. Where, however, deep ploughing is not necessary tractors of a smaller size, for example, of 8 to 10 horse power, should prove more economical. Small tractors would also possess the advantage of being more suitable for work on small holdings and in small fields. We understand that small tractors of low horse power are available, and we suggest that experiments be carried out with this type of tractor, with a view to evolving a design or designs most suitable to conditions in India in general and in different parts of the country.

India is a land of small holdings and, although there is a number of landholders and cultivators whose holdings are large enough to justify the use of power machinery for cultivation, it is obvious that the only hope of placing it within reach of the

vast majority of cultivators is by co-operative effort, or by a system under which ploughing and other operations are carried out by contractors on a contract basis. It is only along these lines that it will be possible for the small cultivator to adopt modern methods and it is clearly important that these matters should be carefully investigated.

Experimental operations in connexion with the mechanization of agriculture will, in all probability, disclose the need for changes in design of tractors and tractor-drawn machinery, and this in its turn may point to the need for a well-equipped section of agricultural engineering at one of the main engineering colleges in India.

6. The conclusions and recommendation of this chapter are—

(i) There is scope for further improvement in agricultural implements. It is suggested that progress would be assisted by, first, the issue of an illustrated account of the implements and farm equipment in use in India, and secondly, the establishment of a central "museum" containing a collection of such implements.

(ii) One of the urgent needs of agriculture in India is a reduction in the enormous number of bullocks employed in farming operations. The substitution of bullock by mechanical power appears to offer the greatest possibility of effecting this reduction.

(iii) In addition to being employed for agricultural operations in the field, bullocks are also used for lifting water from wells, grinding corn and crushing oil seeds and sugarcane. Some progress has been made in the substitution of mechanical for bullock power in the latter operations. It is recommended that all possible measures be taken to encourage the use of mechanical power, particularly in areas where cheap electric power is (or will be) available, for these operations.

(iv) Several Provincial and State Governments have placed orders for tractors for employment in areas infested with deep-rooted weeds and for breaking up new land. It is recommended that these tractors should also be utilized for conducting thorough and business-like investigations into the whole question of the substitution of mechanical for bullock power in farming operations.

(v) Small tractors of low horse-power are now available. It is recommended that experiments be carried out with this type of tractor with a view to evolving a design or designs suitable to Indian conditions.

CHAPTER VI.—MALARIA AND AGRICULTURE

Lieutenant-Colonel Sinton, who was for some years Director of the Malaria Survey in India, wrote in a bulletin published in 1936 entitled "What Malaria Costs India" as follows:—

> These figures suggest that about 40 to 50 times as many "fever" deaths occur in rural areas as in urban areas. As malaria is pre-eminently a rural disease and agriculture is the chief support of the country, the loss which the staple industry of India sustains must be enormous. The influence of this disease upon agriculture is therefore one of the most important economic problems of India . . . The problem of existence in very many parts of India is the problem of malaria. There is no aspect of life in this country which is not affected, either directly or indirectly, by this disease. It constitutes one of the most important causes of economic misfortune, engendering poverty, diminishing the quantity and quality of the food supply, lowering the physical and intellectual standard of the nation, and hampering increased prosperity and economic progress in every way.

Other authorities have written to the same effect. Bentley, who made a special study of the relationship between agriculture and malaria in Bengal, stated in his book, "Malaria and Agriculture in Bengal (1925)" that "as a broad fact only between 58 and 60 per cent of the cultivable area in Central and West Bengal is under cultivation while in the less malarial eastern portion the percentage is 90."

Of all the diseases of India malaria is the most widespread and, as Colonel Sinton has pointed out, its prevalence seriously affects the efficiency of the rural community. In certain parts of the country the economic wastage due to this disease is very considerable. Malaria, though responsible for perhaps a million deaths annually, is not a dramatic disease like plague or cholera; it is, rather, an insidious enemy, producing anaemia and lethargy and destroying initiative and ambition. It lowers the capacity for work of hundreds of thousands below that of a healthy individual. Again, it tends to be worst in the season most suitable for agriculture, and sometimes the sowing and reaping of crops are seriously interfered with. Efficient agriculture demands a healthy worker. If the cultivator is to obtain the optimum benefit from irrigation, an increased supply of manure and improved varieties of seed, he must be healthy. An agricultural community which is weakened in mind and body by malaria will never be a prosperous community.

2. It is not only by impairing the health of the community that malaria disastrously affects agriculture. It also prevents fertile land from being brought under cultivation. For instance, in the United Provinces in the Terai at the foot of the Himalayas, there is a large tract of generally fertile land which is uncultivated chiefly because of its extreme unhealthiness due to malaria. The Government of the United Provinces have told us that it is proposed to survey a large block of this land with a view to

bringing it under cultivation as a Grow More Food measure. The area is so malarious that, if the project is undertaken, it will have to be developed by means of labour battalions under discipline, living in specially constructed anti-malarial barracks. It may also be necessary to withdraw the labour during the malaria season. There are also other areas in the United Provinces, and considerable areas elsewhere in India, which are thinly populated because of the presence of malaria. Instances of the latter are parts of the Vizagapatam and Malabar districts in Madras, the Dinajpur district in Bengal and the Kanara district in Bombay. We may add that reclamation schemes, based on anti-malarial measures found to be effective on an experimental scale, have been initiated in large areas in Malabar and Vizagapatam. If these prove successful, extensive tracts in the hilly and malarial zone stretching across the Madras Presidency from Vizagapatam to Malabar may be cleared of malaria and become available for colonization and cultivation.

3. Prevention, as Dr. Paul F. Russell of the Rockfeller Foundation has pointed out in his admirable monograph on "Some Social Obstacles to Malaria Control"[1] is a social as much as a technical problem. Much further research into economical and effective methods of malaria control is needed, but even more important is the application of existing methods and knowledge. Russell gives the following five "social causes for the maintenance of malaria":—

1. Absence of a sufficient weight of public opinion which has been enlightened regarding, (*a*) economic and public health importance of malaria; (*b*) available measures of malaria prophylaxis and control; (*c*) social responsibility for prevention of malaria.

2. Lack of sound administrative principles, especially as regards, (*a*) co-ordination of, and effective distinction between, hygiene and preventive care, on the one hand, and preventive medicine and medical-surgical care, on the other; (*b*) methods of obtaining effective co-operation between such Governmental departments as Public Works, Agriculture and Public Health; (*c*) necessity for continuity of effort when dealing with malaria.

3. Lack of adequate training of health officers in practical malaria control methods and lack of sufficient numbers of specialist personnel, such as malariologists, malaria entomologists, engineers, and agronomists.

4. Lack of official cognizance of economic considerations as to, (*a*) what malaria actually costs a community; (*b*) what benefits the control of malaria would confer on a community; (*c*) what constitutes a proper budget item for malaria control.

5. Inadequate knowledge of methods for applying practically, that is effectively and economically, the results of research in malariology.

4. We may briefly follow Russell in his discussion of these various social factors. In the first place, education is necessary to create sound public opinion on the problem of malaria, and this

[1] *Indian Medical Gazette*, 1941, 76, 11, 681.

must " permeate the curricula of all schools through technical colleges and universities and be intensely practical." It is particularly important that students should learn something of the economic effects of malaria and the scientific approach to the problem of prevention. To know that " mosquitoes carry malaria " is not sufficient. " The average individual in India, if he ever thinks of it at all, views malaria with resignation, without the faintest idea of how it has retarded the development of his country. He has not the slightest conception that, over and over again, it has been conclusively demonstrated that malaria prophylaxis is not only feasible but economically profitable in many areas. Finally as a rule, he has not the remotest feeling of social responsibility for the control of the disease. There is little urge to contribute either money or labour, in fact even co-operation is often unobtainable. One rarely finds, anywhere in India, an educated, articulate and effective public opinion regarding malaria and its prevention. Absence of this primary mainspring for an effective control programme constitutes one of the chief reasons why malaria continues to ravage the countryside, practically unchecked."

We feel that the first " social cause " mentioned in the previous paragraph, and the passage quoted above, over-emphasize the responsibility of the public for the lack of an enlightened and effective public opinion on the question of malaria control. It is scarcely the fault of the average villager that malaria is accepted with resignation, since he has had little opportunity of learning that the disease can be prevented or how it can be prevented. The most satisfactory method of creating a strong public opinion is by practical demonstrations that malaria can be effectively controlled in malaria-ridden areas, and the organization of such anti-malaria work is the responsibility of Government.

5. While the ordinary man is ignorant about malaria in its various aspects, the same is unfortunately true of administrators generally, and workers in state departments, such as Irrigation, Public Works and Agriculture, whose activities have often a direct bearing on the malaria problem. The distribution of anti-malaria drugs is an essential measure, and in limited and disciplined groups, e.g., military units, the disease can be kept under control by this means. But it has often been demonstrated that the use of such drugs cannot control malaria in the general population, and hence it must be realized that State responsibility for prevention does not end with making them generally available. Another fact of importance in the administrative sphere is that to control the disease *continuity of effort* is required. It not infrequently happens that anti-malaria projects, after preliminary success, are abandoned in a few years because the need for recurring effort and expenditure is not understood. Recurring expenditure is, of course, normally much smaller than initial expenditure. If financial support is withdrawn the effect of the original works soon disappears and the malaria-carrying mosquito regains its dominance.

6. A great deal of malaria is " man-made " produced by faulty irrigation works, faulty agricultural drainage, railway construction, ill-kept tanks, uncontrolled jungle clearance, improper siting and housing of labour groups employed on construction works and in various other ways. Much " man-made " malaria could be prevented by closer co-operation between engineers and malaria experts, and by the instruction of engineers in the principles of malaria control before they undertake executive responsibilities in the tropics. It is essential that the rural development which is so essential to the country should not be accompanied by an increase in the incidence of malaria.

7. On the public health side, more anti-malarial workers are needed. The Public Health Departments of the Provinces and larger States should include a professional malariologist, or a health officer trained in malarial control, a malaria engineer or a sanitary engineer with knowledge of anti-malarial work, an entomologist, and a malaria agronomist. The agronomist would be largely concerned with the prevention of " man-made " malaria produced by faulty methods of agricultural development, etc. Public health anti-malarial organizations must also include a sufficient number of trained field inspectors and laboratory assistants. When the war is over, a considerable number of military officers, commissioned and non-commissioned, who have gained experience of malaria control in the army should be available for civil employment.

8. Malaria control is socially speaking a good investment. In a study in a typical South Indian village, carried out by Russell and Knipe,[1] it was found that the *per capita* annual payments for the treatment of malaria fevers by quacks, priests and doctors amounted to Rs. 2–8–0. Losses due to money paid out and to cash wages not received because of malaria amounted to Rs. 3–14–0 per annum. At the same time it was scientifically demonstrated that in this village malaria could be controlled by the " spray-killing " of adult anopheline mosquitoes for less than Re. 0–8–0 *per capita* per annum. (The principle of " spray-killing " is that houses are sprayed every eight days by a solution of pyrethrum in kerosene. This disposes of most of the adult mosquitoes which are potential carriers of the disease.) In the same area the cost of controlling " irrigation malaria," i.e., malaria due to the breeding of mosquitoes in borrow pits, field channels, wells, irrigation channels and fallow fields under water—was investigated. Initial and maintenance costs were Rs. 4–6–0 and Re. 0–1–11 *per capita* per year respectively. " Intermittent irrigation " has been suggested as a cheap method of malaria control; this involves the periodical interruption of the flow of water on to irrigated land so that the land dries up and mosquito breeding is checked. A sequence of $4\frac{1}{2}$ days of irrigation and $2\frac{1}{2}$ days of drying has been recommended. It appears, however, that the drying of paddy land to a sufficient degree to affect mosquito breeding may interfere with the growth of rice crops and the question is one which requires further investigation.

[1] J. Malaria Institute, India, 1941, 4. No. 2.

9. These examples illustrate the fact that malaria control in rural areas is not, as is sometimes thought, an impossible proposition. It is true, as Russell points out, that it would be difficult to persuade the villagers themselves to produce the eight annas *per capita* needed for spray-killing, and that two annas *per capita* annually is about the amount which, at current levels of expenditure on public health, local and Government authorities are likely to make available for malaria prophylaxis. The sums mentioned above include the cost of paid labour, and it is to be observed that if villagers could be persuaded to undertake anti-malarial work without payment, for their own very material benefit, the cost of such work would be greatly reduced.

Further research may lead to the development of control methods which are cheaper and more effective than any yet evolved. Pyrethrum has hitherto been the most effective insecticide for anti-malarial work; its production in India has been developed during the war, mainly to fulfil military needs, and after the war local supplies could be fully used for anti-malarial control among the civil population, and its cultivation if necessary extended. Brief reference must also be made to the remarkable new insecticide, D.D.T., which appears to be a most potent weapon against mosquitoes and insect pests in general.

10. In Bengal attempts have been made to secure public co-operation in anti-malarial measures and an "Anti-Malarial League" was founded in 1912. Later, in 1919, this was converted into the "Central Co-operative Anti-Malaria Society, Limited" with the object of organizing "a network of autonomous co-operative anti-malarial and public health societies throughout the Province of Bengal for taking measures for the eradication of epidemic diseases and to group these societies together for effecting larger sanitary measures and medical relief." It appears that in the earlier years of its existence this society achieved something by enlisting the voluntary labour of its members who undertook jungle clearance, swamp drainage, drain construction, etc., while, with technical help from Government, water-courses were straightened or improved and houses and yards in villages inspected. Later, the initial enthusiasm of the "anti-malarial and public health societies" faded and Bengal remains the most malarial province in India. In Baroda the public has co-operated in anti-malarial measures in towns and villages and good results have been obtained.[1] In the country as a whole, however, little attempt has been made to enlist the support of the public in the campaign against malaria.

11. We hope that after the war a most vigorous attack will be launched on both urban and rural malaria in India. The control of urban malaria is a relatively simple problem and there is no valid reason why it should not be achieved. Malaria control in general is essential to the satisfactory development of the country's

[1] The Baroda Scheme covers 15 towns and 367 villages, the cost being Rs. 50 per village and Rs. 1,000 per square mile in urban areas. Half of this is borne by the Government and the remainder by local bodies and municipalities.

agricultural resources. There is little excuse for the usual attitude of defeatism with regard to the problem. We may quote here a remark of Sir Ronald Ross, the great discoverer of the cause of malaria: "The prevention of malaria depends not so much on profuse expenditure as on the intelligence, enthusiasm, and energy of those who are responsible for sanitary affairs."

While malaria is the most common and the most debilitating disease in rural India, there are other diseases which impair the health and physical efficiency of the cultivator. In certain parts of the country hookworm is widespread and, like malaria, leads to anæmia and bodily weakness. Here again eradication is possible if vigorous steps are taken. It may indeed be said that *all* measures to prevent disease and improve health in rural areas will help to increase the cultivator's capacity for work and hence the production of food. For this reason we regard the development of satisfactory health services in rural areas as a matter of the greatest importance.

12. The main conclusions and recommendations of this chapter are—

(i) Malaria is widespread and seriously affects the efficiency of the rural population; it lowers the capacity for work of hundreds of thousands below that of a healthy individual. An agricultural community which is weakened in mind and body by malaria will never be a prosperous community.

(ii) Malaria prevents large areas of fertile land from being brought under cultivation.

(iii) A great deal of malaria is "man-made," produced by faulty irrigation works, faulty agricultural drainage, railway construction, etc. Much "man-made" malaria could be prevented by closer co-operation between engineers and malaria experts.

(iv) The Public Health Departments of the Provinces and the larger States should include a professional malariologist or a health officer trained in malaria control, a malaria engineer or a sanitary engineer with knowledge of anti-malaria work, an entomologist, a malaria agronomist, and trained field inspectors and laboratory assistants.

(v) Malaria control in rural areas is not an impossible proposition and further research may lead to the development of control methods cheaper and more effective than any yet evolved. Malaria control in general is essential to the satisfactory development of the country's agricultural resources. There is little excuse for the usual attitude of defeatism with regard to the problem. A most vigorous attack on both urban and rural malaria should be launched after the war.

CHAPTER VII.—ANIMAL HUSBANDRY

A.—Livestock

In India efficient cultivation depends largely on the capacity of the plough cattle, and cattle are also the source of farmyard manure—the most important manure in the country. The value of cattle, therefore, in increasing the fertility of the soil and thereby the outturn of crops cannot be over-estimated. Again, an increase in the consumption of milk is a most important means of improving the diet of the people and this depends upon the efficiency of the milch cattle. The prosperity of Indian agriculture is thus closely linked with the improvement of live-stock. In this chapter we examine some of the problems presented by animal husbandry.

Numbers

2. The first all-India census of livestock was taken in the cold weather of 1919–20 and since then a census has been under-taken at the end of each succeeding quinquennium. The figures, however, are incomplete. In the fourth census of 1935, two provinces, Bengal and Bihar and Orissa, did not participate owing to financial reasons, and at the fifth census, held in 1940, the United Provinces and Orissa (newly constituted a province in 1936) did not take part owing to the need for economy arising out of the war. The figures for the Indian States are also incomplete, for, although the number of states participating is progressively increasing, the livestock in about 21 per cent of the total area of the states was not enumerated at the census of 1940. The statement below gives, for each of the main provinces and for British India as a whole, the total numbers of cattle and buffaloes according to the census enumerations of 1925, 1930, 1935 and 1940.

Province.	Number of cattle and buffaloes (in '000s).			
	1925.	1930.	1935.	1940.
Assam	5,786	5,662	5,982	6,496
Bengal	25,492	25,287	25,287	23,699
Bihar .. ..)	20,728	21,308	21,308	15,456
Orissa .. ..)				4,863
Bombay	8,481	9,416	9,961	9,734
Sind	2,327	2,379	2,635	2,376
Central Provinces and Berar.	11,671	14,378	13,844	13,279
Madras	22,111	22,441	24,607	22,119
Punjab	15,232	14,293	15,841	15,414
United Provinces	31,046	31,460	32,469	32,469
North-West Frontier Province.	1,091	1,024	1,038	1,033
Total (British India excluding minor Administrations) ..	144,705	148,361	153,745	147,424

Note.—(i) A census was not taken in the United Provinces in 1940; the figure for 1935 has been repeated.

(ii) A census was not taken in Orissa in 1940; the figure given represents the total of the latest census figures for the areas included in the Province.

(iii) A census was not taken in the Provinces of Bengal and Bihar and Orissa in 1935; the figures for 1930 have been repeated.

(iv) Owing to territorial changes, the figures for the two provinces of Madras and the Central Provinces and Berar for the years 1940 and 1935 are not strictly comparable.

It is difficult to draw precise conclusions from these figures, partly because they are incomplete and partly because of the errors in enumeration to which they are subject, particularly in the permanently settled areas. They do, however, indicate that while there was a considerable increase in the numbers of cattle and buffaloes throughout the whole of British India, except in Bengal, during the ten years ending 1935, the quinquennium ending 1940 was marked by a substantial decrease which was particularly noticeable in the provinces of Bengal, Bihar and Madras. In the absence of full information it is not possible to give a definite explanation of the fall in the five years ending 1940, but the slump in agricultural prices which occurred during the "thirties," may have been a contributory cause.

In Chapter II of Part I we drew attention to the high prices prevailing for cattle and complaints of shortages, particularly of plough cattle, in certain parts of India. Complete figures for the 1944–45 census are not yet available, but the following data in regard to the position in the United Provinces are of interest. They are the result of a census carried out during the course of the year 1944.

Class of cattle.	Numbers in		Increase (+) or decrease (—) ('000s).
	1935 ('000s).	1944. ('000s).	
Bullocks ..	10,153	10,230	+ 77
Cows ..	6,005	5,343	— 662
Young stock (3 years and under)	7,019	5,524	— 1,495
Buffaloes (male) ..	943	834	— 109
,, (female) ..	4,245	4,418	+ 173
,, (young stock) ..	4,104	(Not available)	

These figures indicate that while, as compared with 1935, the bullock population increased slightly, there was a fall of nearly 11 per cent in the number of cows and about 21 per cent in that of young stock. We understand that the census figures also show a decrease in the numbers of cows and young stock in the Madras Presidency. We draw particular attention to this decrease in cows and young stock, for, if it has occurred in other provinces and in the states, it may be necessary, in order to prevent a fall in the number of working bullocks during the post-war period to continue the "war" restrictions on the slaughter of cattle under a certain age.

We attach importance to the maintenance of livestock statistics and recommend that provinces and states should recognize their obligation to conduct quinquennial enumerations on a uniform system of classification.

Livestock improvement—Breeding

3. The problem of the improvement of livestock in India was examined in detail by the Royal Commission on Agriculture (1928) and was again reviewed by Dr. Norman C. Wright in 1937.[1] We shall, therefore, confine our attention to certain of the main aspects of the subject.

[1] Report on the Development of the Cattle and Dairy Industries of India, 1937.

4. The Royal Commission on Agriculture placed the number of stud bulls which should be maintained in India at one million and estimated the yearly requirements at 200,000. As against these figures, the total number of pedigree and approved animals at stud in British India is about 10,000 and the annual issue from Government farms is in the neighbourhood of 1,000. It may be urged that these figures do not give a correct impression of the progress made and that, if account be taken of animals bred in the villages, the number of improved bulls would be larger. In this connection reference may be made to the number of bulls enumerated at the livestock census of 1940 as kept solely for breeding purposes. This number was 500,000 for British India and about 170,000 for certain Indian States. The large majority of these animals were, however, not of the required standard, and even if they were, the total number of breeding bulls would still be much below the figure of 1,000,000 estimated as desirable by the Royal Commission. The provision of stud and approved bulls is clearly a matter which demands the most earnest attention of the Central and Provincial Governments. The solution which Dr. Wright suggests is that " increasing use should be made of the improved (and registered) animals bred under village conditions in selected breeding tracts." This appears to be the only way in which it would be possible to provide the number of breeding bulls required by the country. It would, however, still be necessary to maintain Government breeding farms in order to preserve the type of each breed and to provide a nucleus for further improvement. The extension of existing and the establishment of new cattle breeding farms is, therefore, essential and we notice that the post-war development plans of several Governments make provision for the expansion of these farms.

5. Along with the provision of stud and approved bulls, the castration of inferior animals is essential if there is to be improvement on an extensive scale. Progress in this matter has varied from province to province and the proportion of uncastrated animals is still very large. Apart from the difficulty of providing staff for a task of this magnitude, the best age for castration has not as yet been determined. The difficulty is that the cultivator is reluctant to have his animals castrated at an early age, because he believes that the operation has an adverse effect on the animals' subsequent development. The Royal Commission recommended that an investigation should be made into this matter but we understand that this has not been done; we suggest that an enquiry should be undertaken. We also recommend that every effort should be made to increase the castration of scrub-bulls, particularly in important breeding areas.

6. As regards improved milking breeds, two methods have been tried, cross-breeding with sires of high milk-yielding strains from abroad and selection from indigenous cattle. There is now general agreement that the latter is more calculated to produce results of lasting value, and it has been established that by careful selection

from Indian strains, cows can be bred which are capable of giving milk yields comparable with those of foreign animals. Improvement by selection is, however, a slow process and a considerable period must elapse before high-yielding indigenous cows are available in sufficient numbers for the supply of milk to large urban areas. High milk-yields are of special importance in ensuring an adequate supply for such areas and it may, therefore, be necessary to continue to rely for some time upon first generation crosses with a high milk yield for increasing the supply of milk to cities and the larger towns.

The she-buffalo is growing in popularity largely because of her higher milk yield, and it has been estimated that in British India buffaloes provide over 45 per cent of the total milk supply. In fact, as the Royal Commission on Agriculture observed, " it is the number of she-buffaloes, not the number of cows, that has to be taken into account when seeking an index of the milk production of the province." Although this is the position, it is only recently that attempts have been made to improve the milk yields of buffaloes by selection and breeding from high-yielding strains. We recommend that further work on these lines be undertaken.

7. We have referred to the difficulty of providing an adequate number of breeding bulls. In this connexion, attention may be drawn to the rapid advance made in the technique of artificial insemination. It has been practised with success in Russia where it was necessary to build up large herds of improved cattle within a relatively short period of time. India is faced with a similar problem. The utility of applying this method in Indian conditions is now under investigation by the Imperial Council of Agricultural Research. We may also refer to hormone therapy as providing a possible method of overcoming irregularities of breeding in Indian domestic animals and of increasing milk production. We suggest that the practicability of adopting this method in Indian conditions should also be investigated.

Feeding

8. Feeding is of crucial importance, for no lasting improvement can be brought about by breeding alone, since improved breeds deteriorate rapidly if not fed adequately. The vast majority of Indian cattle are grossly underfed. In his monograph, the Technological Possibilities of Agricultural Development in India, 1944, Dr. Burns estimates that the total number of bovine adults in British India is about 107 millions and that the total feed available consists of approximately 175 million tons of roughages and less than 4 million tons of concentrates. As against the amounts actually available, the quantities of roughages and concentrates required are calculated at about 225 million tons and 13 million tons respectively. On this basis the deficiency works out at 50 million tons of roughages and 9 million tons of concentrates. These figures are, of course, rough calculations, but they afford a guide to the great deficiency in the amount of food available for cattle in the country. The above figures give a

general picture for British India as a whole, but an analysis of the figures shows that deficiency in cattle food is greater in the thickly than in the thinly populated areas, or to express it in another way, the deficiency increases progressively with the increase in the rainfall. For the purpose of this analysis, Dr. Burns divides British India into three regions. The smallest deficiency is in the region in which the rainfall is under 30 inches and the greatest in that in which it is over 70 inches. The region with a rainfall of between 30 and 70 inches lies between these two extremes, but conditions approximate more closely to those in the latter than in the former region.

In the region with a rainfall of under 30 inches, that is, the Punjab, the North-West Frontier Province, Sind, Baluchistan, that part of Bombay lying to the east of the Western Ghats, and the four Ceded Districts in Madras, the roughages available are slightly in excess of the quantity required and the concentrates amount to about 40 per cent of the quantity considered necessary. In the greater part of this region, the cattle, which are estimated to number about 19·5 million bovine adults, may be said to be fairly adequately fed. This is partly accounted for by the comparatively large area under fodder crops. Out of the total area of about 10·5 million acres under such crops in British India, no less than 7 million acres are within this region.

The region in which the rainfall varies between 30 to 70 inches comprises Bihar, Orissa, the Central Provinces and Berar, the United Provinces, the eastern part of Madras excluding the four Ceded Districts, and the northern part of the Bombay Presidency. In this region with an adult bovine population of about 61·5 millions roughages and concentrates available are estimated at about 74 and 26 per cent respectively of the quantities required. The deficiency in roughages is largely accounted for by the smaller area under fodder crops. This amounts to about 3 million acres, and would have to be increased by at least six times in order to give the same quantity of green fodder per head of cattle as is available in the region with a rainfall of less than 30 inches.

The position is the worst in the region with a rainfall of over 70 inches. This comprises those parts of the Madras and Bombay Presidencies which lie west of the Western Ghats, Coorg, Bengal, and Assam. In this region with an adult bovine population of 26 millions, the roughages and concentrates available amount to about 67 and 27 per cent respectively of the quantities required. The smaller area under fodder crops is particularly noticeable, amounting to less than 500,000 acres. In order to provide green fodder on a scale equivalent to that available in the region with a rainfall of less than 30 inches, the area under fodder crops would have to be increased by about 9 million acres, that is, about 18 times the present figure.

The great need for improving the feeding of cattle is fully realized by the Agricultural Departments in India and some

improvement has been effected through the introduction of improved fodder crops. But, Dr. Burns' figures show that as yet only the fringe of the problem has been touched.

Roughages

9. Roughages consist of straw, grass, and fodder crops. An increase in the area under cereals, if it is accompanied by an increase in the number of bullocks, may not result in an increase in the quantity of straw per animal. This is one reason, why tractors should be used as far as possible in bringing new land under cultivation. An increase in the yield of cereals per acre, on the other hand, will be accompanied by an absolute increase in the amount of straw available for cattle feeding, and hence the measures we have recommended for increasing the yield of food crops should lead to some improvement in the feeding of cattle.

Grazing areas fall roughly into two groups, cultivable waste and forest lands. The former are the more important, for, only a small proportion of the total cattle have access to forest grazing lands. The area of grass lands is decreasing owing to the increasing pressure of the agricultural population on land, and this process is likely to be accelerated in the future in view of the need for increasing the area under foodgrains. It is, therefore, essential that the best possible use should be made of all available grass lands. The Royal Commission on Agriculture emphasized the need for regulating grazing and the establishment of a system of rotational grazing, and the Animal Husbandry Wing of the Board of Agriculture recorded the following observations in 1939:—

> The Board notes with satisfaction the various efforts that are being made in Provinces and States towards the improvement of grass lands and recommends that this should be extended and intensified and linked up with all other movements towards soil conservation and planning for better land use. Further, that local governments be invited to consider the desirability of taking legislative powers, where necessary, for enforcing the proper utilization of grazing areas and waste lands capable of producing fodder or fuel.

So far, however, relatively little work has been done on the improvement of grass lands, and certain experimental schemes, sponsored by the Imperial Council of Agricultural Research in Bombay and Baroda, had unfortunately to be deferred till the end of the war owing to the difficulty of obtaining fencing material. We recommend that experiments in reseeding with indigenous and foreign drought-resistant varieties, rotational grazing, and manuring should be undertaken as soon as possible. All these experiments will require that the land should be enclosed. The heavy expenditure involved in the erection of ordinary cattle-proof fencing may, however, as Sir John Russell has pointed out, be avoided by the use of a single strand of barbed wire electrified by means of an ordinary motor car battery. This method has proved successful in England.

Large areas of land in all provinces are classed as "other uncultivated land excluding current fallows." The whole of this uncultivated land is not capable of growing crops but, as Sir Herbert Howard points out in his monograph on "Post-war Forest Policy for India," large tracts could be utilized for the purpose of providing timber, fuel and grazing by the establishment of "minor" forests. These are short rotation forests, the rotation varying between 15 and 20 years, and they can be opened to grazing within three or four years of planting when the trees are safe from damage by animals. Such forests provide good grazing until the trees have grown to such an extent as to prevent the growth of grass. Work has already been undertaken on these lines in certain provinces. We recommend that a survey should be carried out in all provinces of the lands suitable for development in this manner and schemes of afforestation put into operation.

10. Special fodder crops at present contribute about 11 per cent of the total available roughages. In 1901 the area under these crops in British India was 2·9 million acres; it had increased to 10·2 million acres by 1935 and to 10·5 million acres by 1941. This is less than 5 per cent of the net cultivated area. In addition, an undetermined proportion of jowar, bajra, and maize, and sometimes of other cereal crops is fed to cattle and other livestock. The increase in the fodder acreage may give an impression that cattle are better fed than they were 40 years ago. A more likely explanation, however, is that the decrease in grazing lands, combined with the increase in the number of cattle, has made the growing of fodder crops an absolute necessity. However that may be, there is no doubt that the production of fodder crops is quite inadequate. Further, as we have pointed out in paragraph 8 of this chapter, the distribution of these crops is very uneven; 7 million acres to 19 million bovine adults in the region with a rainfall of under 30 inches; 3 million acres for 61·5 million animals in the region with a rainfall of between 30 and 70 inches; and 0·5 million acres for 26 million cattle in the region with a heavy rainfall. In the absence of good grazing, green fodder is essential for the maintenance of the health of the animals. Agricultural Departments in India are fully alive to the need for increasing the supply of green fodder, and the introduction of *berseem* and various exotic grasses, such as Napier grass, Guinea grass and Sudan grass, has resulted in some improvement. We doubt, however, whether it is possible in many parts of India to bring the production of green fodder crops up to the required level, unless it proves practicable to adopt mixed farming on an extensive scale or, as we pointed out in an earlier chapter, the number of bullocks is reduced considerably by the use of power-driven implements.

Concentrates

11. Concentrates consist of seeds, bran, pollard and oilcakes. These have a high nutritive ratio and are of particular importance as a feed for milch cattle. Oilcake is the most important

of the concentrates both as regards quality and quantity. In Chapter II of this part, we have already drawn attention to the need for crushing in India as much as possible of the oilseeds produced in the country, with the object of increasing the supply of oilcake for use as manure and as feed for cattle. But this will not solve the problem; the supply will still be inadequate. An increase in oilseed production will also be necessary. Hulls of pulses are another important source of concentrates. Pulses are an important ingredient in the human diet and as we pointed out in paragraph 10 of Chapter III of Part II, human nutritional requirements call for a large increase in their production. An increase in the production of pulses will, therefore, also provide an increased supply of concentrates for cattle.

Mixed farming

12. It has been suggested that a solution of India's food and fodder problems is to be found in the adoption of the system of "mixed farming." Sir John Russell in his Report (1937) on the work of the Imperial Council of Agricultural Research observes that "a wider introduction of fodder crops into Indian agriculture would probably effect a great improvement in yields and in the total output. More food for the animals would mean more manure and enhanced fertility of the soil. This was the prime factor in the improvement of British agriculture and the additional yields of grain more than compensated for the area taken from grain and put into fodder crops."

Dr. Wright stresses the same point in his report on the development of the Cattle and Dairy Industries in India. On page 60 of the Report he says—

> The solution of the problems appears to be along the lines indicated above, namely, the development of a 'mixed farming' system. In such a system the production of animal products, such as milk, is carried on side by side with the system of cropping in which leguminous fodder crops take an important place and in which full use is also made of the increased quantities of cattle manure.

Dr. Wright also draws attention to the improvement in the condition of the agricultural population through the adoption of a system of mixed farming in Nigeria and other territories in West Africa.

The Imperial Council of Agricultural Research has instituted several experimental schemes of mixed farming in the United Provinces, the Central Provinces, the North-West Frontier Province, and Sind. In view, however, of the importance of the subject, we doubt whether these experiments are being conducted on a sufficiently large scale. The introduction of mixed farming has been strongly advocated by experts well qualified to advise on the subject, and it appears to us to be imperative that the possibility of introducing this system should be fully investigated in all provinces. We accordingly strongly recommend that the experiments now being carried out should be continued and extended to other parts of India, for example, Bihar, Bengal, and Madras, where

the difficulties attending the adoption of the system are probably greater than in the areas in which investigations are now being conducted.

Dual purpose cow

13. We would draw attention to the possibility of a dual purpose cow, that is, a cow which could be used for draught purposes and yet yield a reasonable supply of milk. Actually, cows are used as plough cattle in some parts of the country. According to the livestock census of 1940, the number of cows so used in Bengal and Madras was over 800,000 and 500,000 respectively.

Writing about Eastern Europe where the density of human and cattle population and the standard of agricultural production are similar to those of many parts of India, Lamartine Yates and Warriner (Food and Farming in Post-war Europe, 1943) comment as follows:—

> One of the great burdens of East-Europe farming is the excessive number of work animals on the very small farms. . . Until pressure of population can be relieved so that farms can be a little larger, it is essential that work animals should also be productive animals. For instance, in Switzerland, where in some districts the holdings are extremely small, the peasants are urged, not always successfully, by their economic advisers to use a cow for ploughing and other field cultivation. The effort of working, it is true, somewhat lessens the cow's milk yield, but the loss is small compared with the cost of keeping a horse.

We do not feel we are in a position to express an opinion on the question of the use of the milking cow as a draught animal for cultivation. But we would suggest that it is a matter worthy of investigation, for we attach importance to any measure which will by reducing the total number of cattle, enable the remainder to be better fed. In this connection we would point out that in many parts of India plough cattle are used only for a few months in the year and that, therefore, it would be only during a part of the year that the cow would be required for work on the farm.

Livestock other than cattle

14. In addition to the cattle population, India has large numbers of sheep and goats. According to the census of 1940 there were over 27 million sheep and about 39 million goats in British India. These animals are a valuable asset as they produce wool, hair, skins, meat, and in the case of goats, milk. It is interesting to note that, generally speaking, the number of goats per square mile varies directly with the density of the population. For instance, Bengal has 85 goats to the square mile, the United Provinces 75 and Bihar and Madras 63, as compared with 35 and 38 in the Punjab and Bombay respectively. Sheep show a different distribution, the number per square mile being the largest in Madras (114) and the smallest in Bengal (8) and Bihar (15). Work on the improvement of the breeds of sheep and goats is in progress. This work should continue and in view of the importance of the

goat as a subsidiary source of income to the agricultural population in the densely populated areas, we suggest that special attention should be paid to improving the breeds of this animal in these areas.

The number of pigs is small, being only about 2 millions (exclusive of the United Provinces and Orissa); this is due to the fact that the pig is regarded as an unclean animal by the majority of the population and is kept by a relatively small section of the people. So far, little has been done towards effecting improvements in the breeds of pigs. In the circumstances this is natural —more important matters have demanded attention—but we suggest that, as the pig is kept and eaten by some of the poorest and most backward sections of the people, pig breeding is a matter to which more attention should be given.

The keeping of poultry is an important cottage industry in rural areas, and eggs, fowls and ducks are valuable sources of food. Before the war the number of fowls in the country was estimated at 173 millions and of ducks at 17 millions. The aggregate value of eggs at the pre-war price of one pice each has been estimated at Rs. 5·25 crores.[1] The Imperial Council of Agricultural Research has financed schemes for the improvement of poultry and for the control of disease, and the Agricultural Departments in many provinces have special sections dealing with poultry. In some provinces, notably in the United Provinces, large poultry (fowls and ducks) farms have recently been started by and in association with the military authorities. We trust that full advantage will be taken of the experience gained in the working of these farms in the post-war period.

Livestock disease

15. Cattle constitute the largest proportion of the cultivator's working capital and their loss, therefore, through disease throws a heavy burden on his resources and is very frequently the cause of his indebtedness. The prevention and control of cattle disease must, therefore, play an essential part in a programme of livestock improvement. Research into the causation, prevention and cure of disease is carried out at the Imperial Veterinary Research Institute. Excellent work has been done but there is great need for more research and we welcome the proposals which we understand are under consideration, for the extension of the research activities of the Institute.

A contributory cause to the loss of cattle through disease in some parts of the country, is the reluctance of many cultivators to submit their livestock to preventive and curative treatment. This can only be overcome by the efforts of a qualified and adequate veterinary staff which by their success in the prevention and cure of disease, will dispel the ignorance and prejudice which now unfortunately prevail.

[1] Report on the Marketing of Eggs, page 2.

The Royal Commission on Agriculture made recommendations for a large increase in the Veterinary Services in the provinces. Although there has been some increase in staff, a really effective organization has not yet been built up and further expansion of veterinary hospitals and staff is essential.

B.—Milk

16. Estimates of milk production in India vary widely. Olver and Vaidyanathan[1] estimated it at 1,000 million maunds (36·7 million tons). Wright[2] considered this estimate excessive and placed the figure at 800 million maunds (29·4 million tons), 700 million maunds being hand-drawn milk available for human consumption. A report[3] of the Marketing Adviser (1941) gives the following estimates:—

	Number of milking animals (millions)	Annual yield of hand-drawn milk per animal (lb.)	Annual net production of milk (million maunds/ tons).	Quantity consumed by calves and lambs (million maunds/ tons).	Total annual production of milk (million maunds/ tons).
Cows ..	49·0	487	290 (10·65 tons)	76 (2·79 tons)	366 (13·44 tons)
She-buffaloes ..	21·4	1,229	320 (11·76 tons)	33 (1·21 tons)	353 (12·97 tons)
Goats ..	9·8	162	19 (0·70 tons)	6 (0·22 tons)	25 (0·92 tons)
			629 (23·11 tons)		744 (27·33 tons)

Olver and Vaidyanathan estimated daily *per capita* consumption as 10 oz. Wright's estimate was 7 to 8 oz. while that of the Marketing Report was 5·8 oz. Consumption varies widely in different parts of the country so that an all-India average, even if accurate, does not give a true picture of the position. The Marketing Report quoted above gives estimates for the different provinces. Sind was the highest with 18 oz. *per capita*, followed by the Punjab with 15·2; in the United Provinces, the North-West Frontier Province, Bombay, and Bihar intake was estimated at 7·0, 6·8, 5·5 and 4·2 oz., respectively; while in the remaining provinces it did not exceed 3·7 oz. and in the Central Provinces and Assam was as low as 1·8 and 1·3 oz. respectively. These figures may be compared with the *per capita* consumption of 56 oz. in New Zealand, 41 oz. in Great Britain and 36 oz. in United States of America. Within a province production and consumption will of course vary from locality to locality and an average production of less than 4 oz. means that a large section of the population gets no milk at all.

The average milk yield of Indian cows is very low. It is estimated in the Marketing Report as 487 lb. per annum, which may be compared with reported figures of 7,005 lb. for Denmark,

[1] Assessment of the Annual Contribution of Livestock to Indian Economy, 1934.

[2] Report on the Development of the Cattle and Dairy Industries of India, 1937.

[3] Report on the Marketing of Milk in India and Burma (1943).

3,463 for Australia, and 2,663 for Egypt. The average annual yield of the Indian she-buffalo is higher than that of the cow, but only 1,229 lb. according to the same report. The basic cause of these low yields is inadequate feeding. If feeding can be improved, breeding and good management can greatly increase milk production.

It is not necessary to emphasise the value of milk as a food. It is a good source of animal protein and of various vitamins and mineral salts and is of particular value as an ingredient in vegetarian diets, or diets which though they may include a little meat or fish, are physiologically speaking, practically vegetarian in character. Experiments have shown that groups of Indian school children receiving additional milk—whole or skimmed—increase in height and weight more rapidly than similar groups not given milk. The bulk of the population of India does not get enough milk and its low consumption is a matter of deep national concern.

We shall now discuss the possibilities of increased milk production. The three important milking animals—the cow, the she-buffalo and the goat—will be considered separately.

The cow

17. The cow performs the dual function of producing bullocks for farm work and milk for human consumption. Her present low yield makes her a liability to the farmer, since the milk she gives does not pay for her feed. She is therefore neglected, particularly when dry. If she were better fed her milk yield would improve and if her milk yield improved it would pay the cultivator to feed her better. This is one of several vicious circles in Indian farming.

The potentialities for increasing the yield of cows by proper management and feeding are considerable. Experience has shown that when village cows are put on government farms they give on an average about 60 per cent more milk in subsequent lactations, and the yield of their progeny may be further increased by 10 or 15 per cent. The yields of indigenous breeds have been trebled or more in less than 20 years by selective breeding and proper feeding in government farms. In well-managed dairy farms yields per lactation of 4,150 lb. from purchased cows, and 5,720 lb. from farm-bred cows, have been obtained.

As long as the cow is needed for the dual purpose of producing bullocks and milk, care must be taken that improvement in milking qualities is not brought about at the expense of satisfactory working qualities in the progeny. There is, however, a place for the specialised dairy cow in the farming economy of India, notably in the development of mixed farming. On a prosperous mixed farm the farmer could grow fodder, keep and feed a cow of a high yielding strain, and add to his income and improve his

diet. A well-fed cow may be used to some extent for draught purposes as well as for milk production, and such a cow may be more useful to the farmer than an ill-fed bullock and a worse fed cow.

The she-buffalo

18. While the cow in India is kept primarily as a producer of the draught bullock and only secondarily as a milk-producer, the she-buffalo is maintained essentially for milk production. Under present conditions she gives more milk than the cow; the average milk yield of the she-buffalo is stated to be 1,229 lbs. per annum, and in certain Government dairies yields of 5,210 lbs. have been obtained. Buffalo milk has a higher fat content[1] than cow's milk. The buffalo has also remarkable powers of converting coarse fodder into milk. The relative importance of the she-buffalo and the cow as milk providers varies from province to province. The proportion of the milk supply obtained from the buffalo is lowest in Bengal, and is low in Assam and the Central Provinces. In the remaining 7 provinces it varies from 40 to 63 per cent and in 5 of these exceeds 50 per cent. Illustrative figures are given below:—

Number of cows and buffaloes over three years old kept for milk production[2].

Province.	Bovine population of over three years kept for breeding and milk production.		Proportion of milk contributed by buffaloes.
	Cows.	Buffaloes.	
Assam	1,305,188	112,781	18·4
Bengal	7,673,067	256,669	7·6
Bihar and Orissa	5,792,528	1,625,792	53·9
Bombay	1,796,896	1,153,869	51·9
Central Provinces	3,216,893	830,084	26·8
Madras	4,280,661	2,395,870	50·1
North-West Frontier Province	206,974	137,648	51·2
Punjab	2,549,778	2,873,692	63·6
Sind	761,107	339,573	40·0
United Provinces	5,726,249	4,060,877	46·9

The census statistics indicate the growing popularity of the she-buffalo. From 1915–16 to 1934–35 the number of cows increased from 37·7 to 38·7 millions, an increase of 3 per cent, while the number of she-buffaloes rose from 13·6 to 15·4 millions during the same period, an increase of 13 per cent. The census figures of 1940–41 show a decrease of about 0·5 million in the cow population, but an increase of about 0·1 million in the number of she-buffaloes. In paragraph 2 we have given figures of the latest census for the United Provinces, which show that while the number of cows has declined by 11 per cent the number of she-buffaloes has improved by 4 per cent even during the war years. It is only

[1] *Fat per cent*—

Buffalo milk	6·5 to 8·0
Cow	4·5 to 5·5
Goat	4·0 to 5·0

[2] Report on the Development of the Cattle and Dairy Industries of India—by Norman C. Wright, page 174.

recently that attention has been given to the question of improving the buffalo, and the potentialities for increasing the milk yield of this species have not been fully investigated. A valuable contribution to the milk supply of India can be made by increasing the numbers of she-buffaloes and improving their yields. It may be added that some large buffalo dairy farms have recently been established by the army.

The goat

19. The third source of milk supply is the goat.[1] According to the census figures of 1940–41 there are in India 9·8 million goats (16 per cent of the total goat population) which are milked and these yield some 19 million maunds (0·7 million tons) of milk. Average annual yield per goat is estimated at 200 lbs. but goats of certain breeds give a yield of almost 400 lbs. At the Hissar Government Farm some goats have given a yield of over 700 lbs. in one lactation, while one goat gave as much as 1,000 lbs.[2] The highest yielding goats in the Punjab give more milk than cows of average yield in Bengal. Generally speaking, it is in Northern India that the goat is of importance as a milk-producer. In Bengal and Central and South India goats are at present little used as a source of milk. Only 3 per cent of the total all-India milk supply is in the form of goat's milk.[3]

The Imperial Council of Agricultural Research is financing various schemes for improving the milk yield of goats and has initiated a special scheme in Bengal. The possibilities of raising yields through improved feeding and selective breeding are considerable. Since it is essential to increase milk intake, and since goats, in view of their large numbers, should be able to make a substantial contribution to total milk supply, more attention should be given to the milch goat than has previously been the case. One disadvantage of the goat as a domestic animal is its destructiveness; unless properly controlled it may cause havoc in forest areas and in vegetable gardens. Its capacity for doing damage could, however, be reduced by better control and management, stricter regulations in forest areas, the thorn fencing of vegetable plots, etc.

Sheep, camel and ass milk is of little importance. In North-west India certain breeds of sheep are regularly milked and those of the Daman and Lohi breeds are good milkers. " Camel milk is seldom drawn for sale but nomadic breeders may use it for drinking." [4]

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[1] (*a*) " . . . a good milk goat will supply sufficient milk for the average family for at least nine to ten months of the year, and can be kept where it would be impossible to keep a cow, they occupy a place in American agriculture not filled by any other class of livestock, and one that is probably destined to be increasingly important " (page 1294, Year Book of Agriculture, U.S.A., 1937).

(*b*) According to the same publication a doe of the Saanens breed produced under test conditions 4,161 lbs. of milk in nine months and one of the Toggenburg breed 2,759 lbs. in ten months.

[2] Report on the Marketing of Milk in India and Burma (1943), page 11.

[3] *Ibid.*, page 50.

[4] *Ibid.*, page 12.

The dairy industry

20. The bulk of the milk supply of the country is produced in rural areas. It has been estimated that only 4 per cent of milch cows and less than 6 per cent of milch buffaloes are kept in towns and cities.[1] According to the Milk Marketing Report some 72 per cent of the total milk supply is turned into various milk products, 57 per cent being converted into *ghee*. Less than one-third (28 per cent) is consumed as liquid milk. The sale of *ghee* yields smaller profits to the producer than that of fresh whole milk, but owing to lack of facilities for storage and transport the rural producer, except in the neighbourhood of urban areas, cannot sell his milk in this form. *Ghee* has good keeping qualities and can conveniently be manufactured, stored and transported under existing conditions. The result is that producers in general turn their milk into *ghee*, which is sold to urban consumers, and usually retain little whole milk or *ghee* for their own use. The following figures illustrate this point:—

Milk retained by the producer and marketable quantity.

	(Million tons.)			
	Cow.	Buffallo.	Goat.	Total.
Net amount hand-drawn	10·65	11·76	0·70	23·11
Retained by producer as fluid milk or product	2·86	0·95	0·35	4·16
Marketable quantity as fluid milk or produot	7·79	10·81	0·35	18·95

While some 95 per cent of the milch cattle are in rural areas, whole milk and *ghee* are in general little consumed in villages in the greater part of the country. "Even in tracts where much larger quantities of milk are produced, 16 per cent of families do not consume any milk or milk products at all. Conditions in the other rural parts of India, where the production is much less should, therefore, be still worse as regards the production and consumption of milk and milk products."[2] It must, however, be observed that the buttermilk or *lassi* which remains after the fat has been removed in the preparation of *ghee*, and which contains most of the valuable constituents of milk other than milk fat, is usually consumed in the village.

The Milk Marketing Report states that "the figures for 23 important cities in the country show that the urban intake is almost double that of the daily average consumption of milk and milk products in India," being 12·6 oz. *per capita* per day (liquid milk 3·7 oz., products—mainly *ghee*—in terms of liquid milk 8·9 oz.)[3] While it is questionable whether these figures accurately reflect the present situation, there is no doubt that previous to the war some progress was being made in the development of the urban dairy industry. Dairy herds are kept in the neighbourhood of

[1] Report on the Marketing of Milk in India and Burma (1943), page 4.

[2] *Ibid.*, page 52.

[3] *Ibid.*, page 58.

urban centres, and often within municipal limits, and villages within easy reach supply fresh milk. During the war large dairy farms have been established in certain areas by the military authorities to meet the needs of the army. Provincial Governments and municipal corporations are taking an active interest in improving the supply of milk for the urban population and have under consideration schemes for establishing dairy farms. The supply of milk and milk products in towns and cities is, however, in general insufficient to meet demand. The milk sold is of poor quality as regards cleanliness and purity, the adulteration of whole milk and *ghee* being exceedingly common. The keeping of cattle within urban limits is undesirable from the public health standpoint since it encourages the breeding of flies. Milch cows are often transported to cities, milked during one lactation and then slaughtered, the result being the unnecessary loss of useful milking animals. Much needs to be done in order to improve urban supplies of milk and milk products. Better marketing arrangements and stricter control of the quality of milk and milk products on the part of public health authorities are required. The further development of co-operative organizations for the production and distribution of milk is strongly to be recommended. The question of pasteurization requires attention. At present there are a few good urban dairy farms selling pure milk of high standard, but in general even consumers who can afford to pay liberally have difficulty in obtaining milk of guaranteed quality.

A well-organized urban milk industry will stimulate production in the neighbourhood of urban centres and lead to the introduction of high-yielding breeds, and better feeding and management. With the growth of industry the urban demand for milk is likely to increase. We have referred briefly elsewhere to the industrial manufacture of processed milk products. If dried milk could be manufactured in the few areas in which there is a surplus of milk, it would provide an addition to urban milk supply, and also have the effect of stimulating the development of the dairy industry and the improvement of cattle.

General observations

21. The problem of increasing milk production in India is a vast one, the solution of which depends essentially on increasing the supply of feed and fodder for milch animals, and on the development of mixed farming which provides a place for fodder crops in crop-rotation. As we have already pointed out (Chapter III of Part II) there are certain parts of the country in which the difficulties are particularly serious. Great efforts are needed on the part of animal husbandry departments, both as regards research and its practical application. To determine the place of different milch animals in the farming economy of the small holder, the economics of milk production in the case of these animals require careful investigation. The satisfactory development and organization of the urban milk industry are of great importance, and schemes of milk distribution by which certain 'vulnerable' groups are given a prior claim on available supplies have also a place in

'milk policy.' The greater part of the population, is however rural, not urban, and we must emphasize that the basic problem is to bring about a general increase in milk production in rural areas, so that the cultivator can enrich his own diet with milk and milk products.

Summary of Conclusions and Recommendations

Section A

22. The conclusions and recommendations of this chapter may be summarized as follows:—

(i) Importance is attached to the maintenance of livestock statistics and it is recommended that provinces and states should recognize their obligation to conduct quinquennial enumerations on a uniform basis.

(ii) The number of stud and approved bulls is still far below requirements. Increased use should be made of improved and registered animals bred in the villages in selected breeding tracts. The development of artificial insemination may result in a decrease in the number of bulls required.

(iii) An enquiry should be undertaken into the best age for castration of inferior animals and every effort made to increase the castration of scrub bulls.

(iv) An investigation should be made with a view to increasing the milk yields of buffaloes.

(v) It is essential that the best possible use be made of all grazing lands. Experiments should be undertaken, as soon as possible, in re-seeding, rotational grazing, and manuring of grass lands.

(vi) Minor forests should be developed for the provision of grazing and fuel.

(vii) Green fodder crops are in serious short supply. Mixed farming holds out possibilities of increased production of human food as well as feed and fodder for cattle. The experiments now being conducted into mixed farming should be continued and extended.

(viii) The possibility of using the cow for work on the farm as well as for milk production is a matter worthy of investigation.

(ix) Research into the prevention and cure of disease should be expanded. The Veterinary Services in the provinces are inadequate and should be greatly strengthened.

Section B

(x) The average daily *per capita* consumption of milk in India has been variously estimated as 5·8 to 10 oz. Average intake is reasonably high in Sind and the Punjab, but in most parts of India is less than 4 oz. daily, which means that a large section of the population consumes no milk at all.

(xi) The average milk yield of the Indian cow is very low. That of the she-buffalo is somewhat higher. The yields of both can be greatly increased by better feeding and management. Goat's milk amounts at present to only a small percentage of the total milk supply, but there are possibilities of increasing the importance of the goat as a source of milk.

(xii) Less than one-third of the total milk supply is sold and consumed in the form of fresh liquid milk. The milk-producer usually prepares *ghee* from his milk and sells it, retaining the butter-milk or *lassi* for his own use. Producers in the neighbourhood of large urban areas can sell their milk in the fresh state, which is more profitable than the sale of *ghee*.

(xiii) The urban dairy industry has developed during recent decades, but in general the supply of milk and milk products in towns and cities is insufficient to meet demand, and standards of purity and cleanliness are low. Much needs to be done to improve the supply, distribution and quality of milk in urban centres. A well-organized urban milk industry will stimulate production in the neighbourhood of such centres and lead to the introduction of higher-yielding breeds, and better feeding and management.

(xiv) To increase milk supply, the essential requirement is more and better food for milking animals. The economics of milk production in the case of milch animals of different species should be investigated. Primary emphasis must be laid on the need for increasing the production and consumption of milk and milk products in the village.

CHAPTER VIII.—AGRICULTURAL RESEARCH AND ORGANIZATION

The task of agricultural improvement falls into three stages: (i) research, (ii) the confirmation by repeated trials of the results of research, and (iii) the application of these results to the cultivator's field.

Research

2. The Royal Commission on Agriculture (1928) remarked that "in spite of the marked progress which has been made in many directions during the last quarter of a century, it is hardly an exaggeration to say that agricultural research in this country is still in its infancy". Since then valuable contributions have been made by central and provincial research centres, research departments in the states, universities, and other research institutions. The Imperial Council of Agricultural Research has established research institutes and has aided and encouraged research throughout the country. The Indian Central Cotton Committee and other Committees have taken similar action in their own particular fields. But though much has been done, there is an urgent need for further research into the numerous problems on the solution of which the prosperity of the farmer largely depends. For example, further research on the basic problems of soil fertility is imperative in the interest of Indian agriculture.

Increasing facilities for research and the multiplication of research centres will demand closer co-ordination and collaboration between research institutes and research workers. To secure these must be largerly the responsibility of the Imperial Council of Agricultural Research, working in consultation with provincial and state governments. On the general questions of co-ordination and planning of research we may quote from a report on animal husbandry submitted in 1944 to the Government of India by an American expert, Dr. Ralph W. Phillips: "Many (research) projects are ineffective owing to inadequate planning, personnel and facilities . . ." He recommends that "a broad set of objectives and programme of work to meet these objectives" should be established and that the value of a research project should be judged by the degree to which it will contribute towards the predetermined objectives. We endorse these observations and would add that they are equally applicable to agricultural research.

While planned programmes of research into the numerous problems of Indian agriculture and animal husbandry are essential, the danger that the excessive regimentation of research and too inelastic a system may damp initiative and enthusiasm must be borne in mind. Given the necessary directive qualities on the part of those responsible for research policy, it should not be difficult to combine initiative and co-ordinated effort.

3. Research does not always yield quick results and this fact should be realized. The capacity for first class original research is rare and it is always difficult to find really good men for senior research appointments. Too frequently workers are recruited to research institutions who do not possess the necessary qualities to make good investigators. Mere numbers cannot compensate for the lack of such qualities, and if the staffs of research institutes are too rapidly increased, there is a danger that appointments may be filled by men who are not temperamentally suited to become good research workers. Again, if sufficient leaders of research are not available, too large a staff of junior workers may be placed in the charge of one senior worker, with the result that the latter's time and energy are largely devoted to administration to the detriment of original research. Agricultural research in the country has not been without these drawbacks. The development of research should be sure but steady, and a certain degree of "gradualness" in the extension of research institutes is to be advocated.

4. A closely allied question is that of the proper training of research workers. Time spent in such training is never time lost. Hitherto arrangements for the training of agricultural research workers have not been satisfactory. The problems to be investigated are complex and a comprehensive grasp of the sciences bearing on any given line of investigation is necessary. Graduates in science and agriculture, fresh from a university, are often assigned research problems of great complexity. They may begin well but soon reach the end of their intellectual resources. The question of the suitable training of research workers deserves the most careful consideration, which, in our opinion, it has not yet received. Among the functions proposed for the Imperial Council of Agricultural Research by the Royal Commission on Agriculture was the training of research personnel and the grant of scholarships for this purpose. Before a worker is given an appointment on the staff of an agricultural research institute or department, he should have received post-graduate training in agricultural science and the sciences ancillary to agriculture, and have learnt something of the scientific method. Facilities for such post-graduate training are at present quite inadequate and we commend this question to the attention of the Imperial Council of Agricultural Research.

With regard to senior workers, we support the recommendation of Sir John Russell that the "Council should set aside a small fund to assist senior men of approved merit to go overseas for training". The word "training" should not, however, be interpreted as meaning a special course at an approved centre with the object of obtaining a senior degree. What we contemplate is that senior workers of standing and achievement should visit institutions in other countries where research in the field in which they are interested is being carried out, and study the technique and methods of approach followed.

Able and promising young workers should receive every encouragement, and should have good prospects of advancement. Dr. Phillips, in the report previously referred to, makes the following comments: "One of the interesting observations I made in India was the tendency of many of the leaders of organizations to assume all or most of the credit for the programme of research under way . . . In the development of a strong research programme, or in any field of agricultural research, it is necessary to have initiative in all members of the staff. This initiative cannot be developed unless younger men are given encouragement and an opportunity to show what they have done and can do". We do not know how far the tendencies described by Dr. Phillips are general among agricultural and animal husbandry research institutes in India. In so far as they exist, they are detrimental to the development of healthy and strong research organizations, with liberal research traditions. It is among the keen young workers of to-day that the future leaders of research must be sought.

5. Both from the point of view of advancement of research and the efficiency of agricultural education, it is essential that the discoveries made and the conclusions arrived at, in various spheres of Indian agriculture, should be compiled and made available in a convenient and accessible form. We support Sir John Russell in his recommendation that critical monographs by specialists should be prepared on various aspects of agricultural science. We lay particular stress on the compilation of the available material on soils and soil fertility.

Organization

6. As regards the second stage, that is the confirmation of results of research by tests and trials under different conditions, a great deal of useful work has been done on experimental farms. We think, however, that more work is required in the direction of integrating proved results into suitable farm practices. For example, it is not sufficient to establish that a new variety will give an increased yield. It is also necessary to determine the best time for sowing, the amount and kind of manure required to obtain the best results, and in the case of an irrigated crop the time at which and the quantity in which water should be applied. Experimental farms, we suggest, should include work of this nature in their programmes.

7. The third stage, that is, the application of proved results of research to the cultivator's field, is the most difficult. For instance, to produce more rice from an acre of land by sowing an improved variety, by the use of manure and by protection from pests, is a comparatively simple proposition, but to plan and put into execution a scheme whereby every farmer will get such an increased yield is a much more difficult and complicated task. It is the peasant with the small holding who must be the background of all planning, and the recommendations made must be

such that it is possible for him to adopt them and benefit from them, It must be remembered that the peasant is conservative and often illiterate, that his soil often lacks fertility, his cattle more often than not poor, his farm small, and his financial resources restricted. The farmer is the problem. His ignorance must be removed, his prejudices conquered, his implements and cattle improved, and his financial resources expanded. What is required is the planning of a complete scheme of farm economy applicable to the individual farmer. Small demonstration plots where the virtues of a single improvement—a better variety or a more efficient implement—are exhibited will not solve the problem. An entire holding should be taken with the object of demonstrating an improved practice of farming. It is, we think, along these lines that there is need for investigation and demonstration. What we contemplate is a series of 'pilot' farms designed to show the improvements which can be carried out on an average holding by the average farmer.

8. If agricultural production is to be largely increased, the administrative and field establishments in the provinces must be very considerably expanded. The present staff is quite inadequate to deal with large development schemes. The necessity for a large expansion in the establishments is recognized and the post-war plans of development now under preparation in the provinces provide for the strengthening of these establishments. The Government of India have also under consideration a large increase in the staff at the Centre. In fact agriculture must be recognized as one of the most important activities of Government, and Agricultural Departments given a high priority in the allocation of funds for development purposes.

The training of the additional administrative and field staff is a matter of fundamental importance. Recently there has been an increase in the number of institutions inparting agricultural education. Agricultural Colleges have arranged for an increase in the permissible number of students and the Centre and the Provinces have under examination the question of the establishment of additional colleges. If, however, expansion is to be rapid, it will be necessary to tap all available resources. The science departments of universities will prove a fruitful source of recruitment provided that arrangements can be made for the training of science graduates for work in Agricultural Departments.

Summary of Conclusions and Recommendations

9. (i) There is urgent need for further research into the numerous problems on the solution of which the prosperity of the Indian farmer largely depends. For example, further research on the basic problems of soil fertility is imperative.

(ii) Increasing facilities for research and the multiplication of research institutes will demand closer co-ordination and collaboration between research institutes and research workers.

(iii) The capacity for first-class original research is rare and it is always difficult to find good men for senior research appointments. The development of research, therefore, should be sure but steady and a certain degree of ' gradualness ' in the extension of research institutes is to be advocated.

(iv) The training of research workers is important. Facilities for post-graduate training of a worker before he is appointed to an agricultural research institute, are at present inadequate. This matter is brought to the attention of the Imperial Council of Agricultural Research.

(v) Support is given to the recommendation of Sir John Russell that the Imperial Council of Agricultural Research should set aside a small fund to assist senior men of approved merit to go overseas for training in research.

(vi) The important results of research in Indian agriculture should be compiled and published in a series of critical monographs.

(vii) More work requires to be done on experimental farms in the direction of integrating proved results into suitable farm practices.

(viii) A system of ' pilot ' farms is recommended with the object of demonstrating the application of the results of research and improved farming methods to the cultivator.

(ix) If agricultural production is to be largely increased, the administrative and field establishments in the provinces must be very considerably expanded. Agriculture must be recognized as one of the most important activities of Government and Agricultural Departments given a high priority in the allocation of funds.

CHAPTER IX.—TUBERS AND OTHER HIGH-YIELDING CROPS

At the present time, as we have pointed out, there is serious pressure on land in various parts of the country, evidenced by the smallness of average holdings and in other ways. It is, therefore, essential that the most profitable use should be made of land resources. One method of furthering this end is the increased production of certain crops such as potatoes, sweet-potatoes, tapioca [1] and plantains which give larger returns of food energy or calories per unit area than cereals, thereby releasing land for the production of other foods, notably protective foods, in which India is very deficient. Further, India is at present short of rice and barely self-sufficient in other cereals and to provide enough cereals to meet the needs of the growing population will be a formidable task. Hence the production of foods which will reduce the demand for cereals requires careful consideration.

Attempts have been made to relieve the present rice shortage by supplying deficit rice-eating areas with wheat. This policy has been only partially successful, since rice-eaters on the whole do not take readily to wheat, and have not the knowledge and means needed to prepare wheat for consumption in acceptable form. The same applies in general to the use of millets in rice-eating areas. Again, the consumption of wheat or millet as part of a daily ration which consists mainly of rice, involves two cooking operations, adding to household work and increasing the demand for fuel. If supplementary foods which can be cooked with rice, or which do not require cooking, can be made available in greater quantities in deficit rice-eating areas, the situation would be eased.

The Calorie Protein and Carbohydrate Values of Certain Foods

2. The following figures show the calorie value of the foods mentioned above and their chemical composition in respect of protein and carbohydrate. The values are typical ones, taken from Health Bulletin No. 23, "The Nutritive Value of Indian Foods and the Planning of Satisfactory Diets":—

	Rice.	Wheat.	Potato.	Sweet Potato.	Tapioca.	Plantain.
Moisture per cent ..	12·2	12·8	74·7	66·5	59·4	75
Protein per cent ..	8·5	11·8	1·6	1·2	0·7	1·2
Carbohydrate per cent.	78·0	71·2	22·9	31·0	38·7	24·0
Calories per 100 grammes	351	346	99	132	159	110

These figures show protein, carbohydrate and calorie values on a fresh weight basis. The moisture content of the various non-cereal foods is higher than that of wheat and rice and this reduces

[1] This refers to the root *Manihot utilissima*, generally known as manioc or cassava. In most parts of the world the term 'tapioca' is applied only to processed products obtained from the root, but in India it is used to describe the root itself. We have here followed the customary Indian usage.

their percentage content of protein and carbohydrate. Tapioca as actually harvested from the field may contain a higher percentage of moisture than the figure given above. On a fresh weight basis, rice and wheat are very much superior to the other foods in protein content. The latter are, however, good sources of the energy-yielding factor, carbohydrate. Comparison of the calorie, protein and carbohydrate yield per acre of the various foods, calculated on the fresh edible portion, gives the following figures:—

	Rice.	Wheat.	Potato.	Sweet Potato.	Tapioca.	Plantain.
Estimated yield per acre (maunds [1]) ..	10	10	50	50	50	224
Protein yield (Kilograms)	31	43	29	22	13	56
Carbohydrate yield (Kilograms) ..	284	258	416	563	522	1,190
Calories per acre (in thousands)	1,280	1,260	1,790	3,880	2,880	5,040

The yield per acre for wheat and rice quoted is somewhat above the all-India average while that for potato, sweet-potato and tapioca is much below the average.

The non-cereal foods in question give a considerably higher calorie yield per acre than rice and wheat. Even if rice and wheat yields per acre were increased by 50 per cent, a yield of 15 maunds per acre will equal, as regards calorie outturn, only a yield of 50 maunds per acre of potato, 25 maunds of sweet-potato and 33 maunds of tapioca. With improved methods of cultivation, a yield of 200 maunds per acre is not impossible in the case of the latter. Plantain, it is to be observed, gives a larger calorie return than the roots and tubers in question. In respect of protein yield, the roots and tubers are, however, inferior to cereals on the basis of the average yields per acre quoted above[2]. Plantain has approximately the same percentage protein content as potato and sweet-potato, but gives a larger return because of its higher yield per acre.

Potatoes

3. Potatoes have been grown in India for over a century, but their cultivation has expanded only very slowly. From 1930–31 to 1938–39 the acreage under potato increased from 419,300 to 468,700, i.e., by less than 50,000 acres in the course of a decade[3]. The increase in the area under potato during the war years may be estimated at 75,000 acres, bringing the total area under this crop to a little over 0·5 million acres. In contrast, the average annual pre-war acreages in Germany, the United States and U.S.S.R. were reported to exceed 7, 3 and 18 million acres respectively. Before the war annual production in India was estimated at about 1,800,000 tons, while imports were about 42,500

[1] One maund is equal to 82·28 lb. or 37·3 kilograms (approx.).

[2] i.e., taking 50 maunds per acre as the average yield. If a yield of 100 maunds, which is probably nearer the all-India average, is taken, the protein yields per acre of the roots and tubers will exceed those of cereals.

[3] Report of the Agricultural Marketing Adviser on the Marketing of Potatoes (1941).

tons; over half of the latter consisted of imports into Bengal from Burma. If the quantity required for seed is deducted, and allowance made for wastage, the total quantity available for domestic consumption was in the neighbourhood of 1,400,000 tons, or between 8 and 9 lb. *per capita* annually.

We may contrast the position in India as regards potato consumption in relation to cereal consumption with that in certain other countries. The figures given below, taken from "Workers Nutrition and Social Policy", published by the International Labour Office in 1936, show the annual consumption in various countries of cereals and potatoes, on the part of families belonging to the lower income groups. They refer to different dates during the period 1923–35.

Annual consumption per consumption unit or adult man.

	Cereals.		Potatoes.	
	Kilograms.	lb.	Kilograms.	lb.
Germany	138·5	(304·7)	147·8	(325·2)
Belgium	225·5	(496·1)	230·2	(506·4)
Poland	198·6	(436·9)	175·1	(385·2)
Czechoslovakia ..	197·9	(435·4)	118·0	(259·6)
Sweden	112·9	(248·4)	101·1	(222·4)
Finland	129·1	(284·0)	110·4	(242·9)
United Kingdom ..	97·3	(214·1)	78·1	(171·8)
United States	79·8	(175·6)	64·4	(141·7)
Norway	149·5	(328·9)	84·3	(185·5)
Austria	146·6	(322·5)	53·3	(117·3)
Bulgaria	287·6	(632·7)	22·6	(49·7)
Palestine	164·6	(362·1)	35·4	(77·9)

Unquestionably the potato now occupies a prominent position in world food economy; as a world source of food energy it is in fact not very far behind rice and wheat. Its cultivation is of particular importance in the more densely populated European countries. The statement at the end of this chapter illustrates this point. We may also quote E. L. Nixon[1], who says: "The part that the potato plays at the present time in maintaining life, through supplying food to the most densely populated continent, serves to direct our attention to the part it is destined to play as the source of food in our own country (United States of America) and in our own continent in the years to come. The famines which normally devastated Europe became much less frequent after the potato was cultivated as a field crop . . . We need only ask what the universal adoption and the scientific production of potato would mean to the starving millions of China".

There is no reason why the production of potatoes in India should not be substantially increased. The areas climatically suitable for its cultivation are large, including most of Northern India (in the cold weather) and cool areas of sufficient elevation throughout the whole of the peninsula. One of the greatest obstacles to the extension of cultivation is the lack of sound healthy seed, in adequate quantities at the right time and at reasonable prices. In the plains seed potatoes cannot be preserved through

[1] The Principles of Potato Production, 1931.

the hot weather and the rains, and crops readily become diseased and unsuitable for seed purposes. The transportation to the plains of seed from the hills is usually necessary. The storage of seed in cold storage would solve this problem, but cold storage is not at present available. Potatoes also require sufficient water and abundant manure. Apart from the extension of the area under cultivation, Dr. Burns has stated that "given disease-free seed potatoes and suitable manuring, the production of potatoes on the existing acreage can be doubled."

Sweet Potatoes

4. The sweet potato is an edible root of geat importance in many of the warmer countries of the world. It is widely cultivated in China, Malaya and the Southern United States; in the United States of America the area under cultivation is about 0·9 million acres. At present the area under sweet potato in India is not accurately known, but there is little doubt that it is extensive. In Bihar the Government have encouraged its cultivation during the war and there has been a large increase in production, particularly in the Tirhut Division. Similarly there was a considerable increase in the acreage under this crop in Bengal during the famine year of 1943. In the United Provinces sweet potato grows well and is considered a useful supplementary food for the poor man. In the Central Provinces the area under sweet potato is roughly estimated at 10,000 acres and the yield at 25,000 tons. More definite information has been supplied to us about the area under this crop in certain districts in Madras, which is as follows: –

	Area (acres).	Average yield per acre (tons).	Production (tons).
South Kanara ..	20,000	5	100,000
Vizagapatam ..	5,430	4·25	23,000
Malabar	40,000	2	80,000

We were informed by the district agricultural authorities, Malabar, that the area under sweet potato in the district rose from 19,000 acres in 1942 to 31,000 in 1943 and 40,000 in 1944, comprising in 1944 about 2·per cent of the gross cultivated area. This increase was brought about by the cultivator himself on his own initiative, presumably as a response to the shortage of rice, and not as the result of Government propaganda and financial aid. In Malabar sweet potato and tapioca have during the recent period of rice shortage provided a very appreciable addition to food supply.

Sweet potato can be grown from stem cuttings, so that the seed problem, which is so serious an obstacle to the extension of potato cultivation, does not arise. Its demands as regards soil, manure and water-supply are not exacting. In certain areas two crops are produced annually from the same land. It cannot, however, be stored for more than a month under village conditions and is produced almost entirely for local consumption. During the present emergency it has proved a most useful standby in many parts of the country.

The Extension of the Cultivation of Potatoes and Sweet Potatoes

5. We feel that more attention should be paid to the potato and sweet potato by agricultural research workers and departments. Little or no work has hitherto been done on the sweet potato. There are various questions which require investigation: the development of improved varieties in respect of yields and nutritive value; the possibility of finding in other countries high-yielding varieties specially suitable for introduction into India; seed, transport and storage problems; the potentialities of dehydration in normal times, etc. We may add that there are in India numerous wild edible roots, consumed for the most part in jungle and forest tracts, about which little is at present known. These might repay investigation. It is conceivable that amongst them might be found roots which, after artificial cultivation and development on an experimental scale, could be grown as a source of food supply.

The extended cultivation of potatoes and sweet potatoes should be one of the objectives of food policy. The cultivation by villagers of small "patches" of sweet potatoes, and potatoes where this is possible, for their own individual consumption would be an excellent thing, providing additional calories, reducing cereal requirements, and adding variety to the diet. Both should be regarded as useful supplementary foods. The potato, which needs plenty of manure and water, tends in general to be grown as a cash crop rather than as a staple crop, and is at present a supplementary rather than a staple food in the areas in which it is cultivated. The sweet potato, on the other hand, with its less exacting requirements is grown over wide areas and not infrequently consumed as a main article of diet in certain seasons of the year. During periods of food shortage it has helped to save poor agriculturists from starvation and in such circumstances its widespread cultivation is obviously fully justified. But as regards long-term food policy, its use as a staple food, i.e., as a food which is taken as a major ingredient in the diet as a substitute for cereals, is undesirable since it may seriously reduce protein intake. The aim should be to increase its production, simultaneously with that of other foods such as cereals, pulses, fish, etc., which are richer in protein, in such a manner that it forms part of a diet otherwise containing a sufficiency of protein.

Carrots

6. Brief mention may be made here of the carrot, a high-yielding root which is a good source of pro-vitamin A or carotene. Within recent decades its production in various countries has considerably increased and it is growing in popularity. It is a very suitable article of diet for young children. In India the cultivation of carrots has been extended during the war, mainly for military purposes, and after the war further efforts in this direction should be made for the benefit of the civil population. Special attention should be given to the provision of pure seed. The carrot can be successfully grown in most parts of India.

TAPIOCA

7. Tapioca is at present consumed only in the south-western part of the peninsula. It was introduced into Travancore during the last century and its production in that State was extended slowly and steadily up to the outbreak of the Japanese war. After the fall of Burma and the reduction of rice imports, production was pushed forward rapidly to supplement insufficient rice supplies and prevent starvation. The area under this root in Travancore increased by 33 per cent in 1943–44 reaching 0·5 million acres out of a gross cultivated area of approximately 2·2 million acres. Total production was estimated at 750,000 tons. Cultivation has been extended in neighbouring areas for similar reasons. According to estimates supplied to us, the area under tapioca in Cochin has doubled during the war period, its production being 30,000 tons in 1943–44, while in Malabar the area has also been doubled, reaching in that year 40,000 acres, with an estimated production of 120,000 tons. The extension of cultivation in this part of India during the war period, appears to have been in general brought about by the reaction of the population to food shortage rather than as the result of deliberate Government policy.

Tapioca is grown from cuttings, grows well even in poor soil, and needs no irrigation. Hill slopes and uneven undulating land which cannot be put under any ordinary foodcrop, can be planted with tapioca. It is a high-yielding crop which may give a return of from 2 to 10 tons per acre according to conditions of cultivation. In India average yield is at the lower limit of these figures, but a yield up to 15 tons per acre has been obtained in certain trials in the West Indies. Tapioca has various uses apart from its direct consumption by human beings as an unprocessed root. It is a rich source of starch, which after extraction and drying can be used as an ingredient in biscuits, etc., in the manufacture of such products as glucose, glue and size for dressing textiles, and for laundry purposes. Its leaves can provide cattle fodder.

With these advantages, tapioca has one very serious disadvantage. It is a very poor source of protein, poorer than other roots and tubers in general. If it is taken in relatively small quantities, as part of a diet which otherwise contains sufficient protein, no harm will result. A diet consisting of one part of tapioca to three parts of rice, and containing other foods such as pulses or fish which are rich in protein, would not be seriously deficient in this essential food factor; but if these proportions of tapioca and rice are reversed, and other protein-rich foods are not available, protein shortage is likely to result and have ill-effects on health and physical development. In practice the extension of tapioca cultivation often means that the poorer classes eat more and more of this cheap and starchy root, and less and less of other foods. Hence the indiscriminate and uncontrolled spread of tapioca cultivation is not to be recommended, unless, indeed, in an emergency when starvation must be

averted at all costs. In normal times the extension of tapioca growing should be encouraged only if it is possible to ensure that it does not become the chief ingredient in the diet, and that other foods richer in protein are consumed in sufficient quantities.

PLANTAINS AND BANANAS[1]

8. These fruits resemble root vegetables and tubers more closely in chemical composition and calorie value than they resemble juicy fruits, e.g., citrus fruits. They are particularly relished by children and could form part of midday meals provided under school-feeding schemes. We have remarked elsewhere that half a pound of milk daily for every Indian child is unfortunately a remote ideal, but " a plantain a day " is a practicable and attainable objective. Though plantains are no substitute for milk, they have useful nutritional properties. It has been estimated that about 20 per cent of the area under fruits is under plantain, but how far this figure is accurate it is impossible to say. Little work has hitherto been done on this fruit by Agricultural Departments and the questions of extending production, increasing yields and improving marketing arrangements all require attention. The high calorie return of plantain per acre has already been referred to. We feel that an increase in the production of this fruit, for consumption as a supplementary food, particularly by children, should be included among the objectives of food production policy. It may be added that elsewhere in the world a ' flour ' has been manufactured from plantains which while it contains only about 4 per cent of protein, resembles cereal flour in carbohydrate and mineral content, and calorie value.

We have referred to the need for research in potatoes and sweet-potatoes; the same applies to plantains. In various tropical countries, notably in the West Indies where the banana is a most important commercial crop, a considerable amount of work has been done on improved varieties, pests and diseases, storage, manurial problems, etc. In India the plantain may well be given a more prominent position in the programme of Agricultural Research Departments. The possibility of making use of surplus fruit during periods of glut for the manufacture of ' flour ' might be investigated. Marketing problems also require attention. The plantain is a food of greater importance in India than is generally realized.

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[1] In India the word ' banana ' is usually applied to a large fruit grown on the West Coast, whereas elsewhere in the country fruit which would be called banana in Europe and America is called ' plantain '. We understand that there is some botanical distinction between the plantain and the banana, though none as regards nutritive value. We shall here employ the word ' plantain ' to cover all varieties of the fruit grown in India.

Summary of Conclusions and Recommendations.

9. The main conclusions and recommendations of this chapter are—

(i) It is essential to make the most profitable use of land resources. One method of achieving this is the increased production of potatoes, sweet potatoes, tapioca, and plantains which give larger returns of food energy or calories per unit area than cereals.

(ii) The potato, as a world source of food energy, is not far behind rice and wheat, while the sweet potato is an edible root of great importance in many of the warmer countries of the world. The area under potato in India is only about 0·5 million acres, but the areas climatically suitable for its cultivation are large. The area under sweet potato is not accurately known but is extensive and has increased considerably during the war.

(iii) The extended cultivation of potatoes and sweet potatoes as supplementary foods should be one of the objectives of food policy. The sweet-potato is, at present, consumed as a main article of diet in some areas in certain seasons of the year. Its use, however, as a major ingredient in the diet, as a substitute for cereals, is undesirable since it may seriously reduce protein intake. The aim, therefore, should be to increase its production simultaneously with that of other foods richer in protein, such as cereals, pulses, fish, etc.

(iv) Tapioca, the area under which has extended very considerably in south-west India during the war, has one serious disadvantage. It is a very poor source of protein. In normal times, therefore, the extension of tapioca growing should be encouraged, only if it is possible to ensure that it does not become the chief ingredient in the diet and that other foods richer in protein are consumed in sufficient quantities.

(v) An increase in the production of plantains and bananas, for consumption as a supplementary food, particularly by children, should be included among the objectives of food policy.

Comparative statement showing the area and production of potatoes, wheat and all cereals (for grain) in India and certain foreign countries.

(The quinquennial average for the period 1934 to 1938 or 1934–35 to 1938–39 has been given except where otherwise stated.)

Name of country.	Potatoes (*a*).		Wheat (*b*).		All Cereals [for grain (*c*).]		Population (*d*).		Density of population per square mile.	Percentage of col. (2) to col. (6).
	Area ('000 acres).	Yield ('000 maunds).	Area ('000 acres).	Yield ('000 maunds).	Area ('000 acres).	Year to which the figure relates.	Number in thousands.	Year to which the figure relates.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
India ..	449	49,105	34,485	270,240	179,276	1935–36	388,998	1941 Census ..	(*g*) 246	0·3
Germany ..	7,054	1,290,990	(*e*) 5,175	(*e*) 121,129	28,176	1938	69,317	1939 Census ..	381	25·0
Italy ..	1,028	73,004	12,504	194,215	17,053	1937	42,919	1936 Census ..	357	6·0
France ..	3,511	425,993	12,904	219,665	25,864	1937	41,960	1939 Estimate ..	197	14·0
Hungary ..	731	59,013	3,924	59,367	10,179	1938	9,103	1939 Census ..	254	7·2
U.K. ..	733	134,004	1,863	46,601	4,124	1938	47,786	1940 Estimate ..	508	17·8
U.S.A. ..	3,276	275,004	55,557	523,032	215,066	1938	131,669	1940 Census ..	44	1·5
U.S.S.R. ..	(*e*) 17,601	(*e*) 1,675,010	(*f*) 85,802	(*f*) 673,940	244,222	1935	170,467	1939 Census ..	21	7·2

Sources—(*a*) Report on the marketing of potatoes in India and Burma.
(*b*) Estimates of area and yield of principal crops in India 1940–41.
(*c*) International Year Book of Agricultural Statistics, 1938–39.
(*d*) Statistical Year Book of the League of Nations, 1941–42.
(*e*) Average for four years ending 1937.
(*f*) Average for five years ending 1934.
(*g*) The figure for Bengal is 779 and that for Bihar is 521.

CHAPTER X.—VEGETABLES AND FRUITS

Vegetables

Vegetables help to balance and diversify monotonous cereal diets and fall into the category of ' protective ' foods. Different kinds vary considerably in nutritive value. Green leafy vegetables are richer in vitamins and mineral salts (e.g., calcium) than other vegetables in general, and some of the common Indian varieties such as amaranth, coriander leaves, drumstick leaves, etc., are excellent sources of pro-vitamin A—a vitamin for which the need is considerable since ill-health and disease associated with vitamin A deficiency are of frequent occurrence among the poorer classes. Leafy vegetables, of which there are numerous edible varieties, both cultivated and wild, are among the cheapest of foods. Common vegetables which are not of the ' leafy ' type, e.g., brinjal (*solanum melongena*), ladies' fingers (*hibiscus esculentus*) and the various gourds are less valuable from the nutritional standpoint but have various useful dietetic properties. The present intake of vegetables of all kinds on the part of the mass of the population is insufficient and could with advantage be greatly increased, with special emphasis on green leafy vegetables. An increase of 100 per cent has been suggested as a suitable objective.

The Growing of Vegetables for Local Consumption

2. We would lay special emphasis on the growing of vegetables in villages for local consumption. Little attention has hitherto been paid to this question by agricultural and other departments. Sir John Russell remarked that " much more work should be done in the cultivation of green leafy vegetables and demonstration. Fruit and vegetable gardens should be set up adjacent to the villages where they can receive manure and water. A marked extension of vegetable growing is very desirable." The villager in many parts of India is not interested in growing vegetables even when land and water for this purpose are available. In some areas village cultivation of fruits and vegetables on small plots provides appreciable quantities of valuable food, but taking the country as a whole, such cultivation is sadly neglected. This is sometimes due to difficulties about water-supply, but the chief reason for it is the lack of interest to which we have referred. Education and propaganda are required to teach the villager the value of vegetables as food and to persuade him to grow these for his own use when circumstances permit. We have referred elsewhere to the growing of vegetables in school compounds by the children themselves to supplement meals provided by school feeding schemes. This would be of educational value and help to popularize the growing of vegetables in villages.

In the neighbourhood of cities, market gardening on a commercial scale is a paying proposition and has been considerably

developed. We feel, however, that more use could be made in urban areas of private gardens and patches of waste land for vegetable growing on the part of the individuals for their own consumption. In England the 'allotment' system has been very successful during the war and has materially added to food resources. At present the price of vegetables in towns and cities in India is abnormally high and in many urban areas there is a serious scarcity.

The Commercial Cultivation of Vegetables

3. We have dealt with the progress made in the commercial cultivation of vegetables in the chapter describing the Grow More Food campaign. The main difficulty has been the supply of seed of the 'European' types of vegetables—cabbage, cauliflower, etc.—which thrive in the cold weather in Northern India and in elevated tracts in tropical India throughout the year. During 1944, 1,200 acres were brought under seed production in Kashmir and Quetta, and 600,000 lb. of seed, sufficient to grow winter vegetables over an area of 100,000 acres, were obtained. Of this amount, approximately five-sixths were intended to meet civilian demands, while the balance, with the addition of 100,000 lb. of imported seed, was to be provided to the army. It is expected that in 1945 India will produce enough seed to dispense with imports altogether. However, to improve and maintain a high standard in quality, arrangements have been made to import 'mother seeds' from abroad and to produce seed under conditions in which purity can be maintained. The supply of good seed, the high prices obtained for vegetables by the cultivator, the vegetable farms started in co-operation with the military authorities and by the military authorities themselves, have considerably increased production. It is necessary that after the war this increase in production should be maintained and that a rapid fall in production, following a fall in price, should be avoided. The necessary conditions for continued progress are an adequate supply of water and manure, and the supply of good varieties of seed at reasonable prices. Many of the recommendations regarding transport, storage and marketing, which we make in the section which follows with regard to fruit production, apply in general to vegetable production also. There are numerous dealers in vegetable seeds in the country but the trade is at present unorganized and there is no guarantee that the seeds, other than those sold by a small number of well established firms, are of good quality. As in the case of fruit trees, probably the best solution of this difficult problem lies in the establishment of 'recognized' nurserymen and dealers whose sales would be limited to seed which has been certified, after proper germination tests, by the Departments of Agriculture. It will be necessary for all provinces to employ staff specially qualified for vegetable production. We have referred to the development of a plant protection service. Extension of vegetable growing will need such a service, adequate in strength to

deal with the pests and diseases of vegetables. These recommendations apply more particularly to such vegetables as are at present grown on a commercial scale for urban markets, but there is an equal need for developing the production of other kinds of vegetables at present of less commercial importance, both on a commercial scale and for immediate local consumption.

The Nutrition Advisory Committee has placed special emphasis on increased vegetable production as part of the Grow More Food campaign. We ourselves feel that much could be done to increase supplies very materially in a comparatively short period of time.

Fruits

4. According to Dr. Burns, "a recent rough estimate indicates that fruit trees cover $2\frac{1}{2}$ million acres" [1] and it is estimated that the total production of fruit is 6 million tons. [2] This works out at 33·5 lb. *per capita* per annum, or a little less than 1·5 oz. *per capita* daily. Three ounces daily have been recommended as a desirable level of intake by the Nutrition Advisory Committee of the Indian Research Fund Association. It must be realized that agricultural statistics, in general inadequate, are quite unsatisfactory in the case of fruits. First, it is impossible to compute the area under fruit trees not grown in definite blocks, orchards or groves, and such isolated trees are numerous all over the country side. (This difficulty with regard to estimating fruit production, it may be added, exists in all countries, and statistics of such production are everywhere inaccurate.) Secondly, in the published statistics for India, the area under fruits, vegetables, and root crops is not differentiated. The results of diet surveys suggest that the figure of 1·5 oz. *per capita* mentioned above over-estimates actual consumption.

Fruit as an Article of Diet

5. To determine the place of various fruits in schemes to ensure the most profitable utilization of land, and the provision of a balanced diet to the people, data about yield and cost of production per acre are necessary. Data about yield are available only for certain fruits, e.g., citrus fruits, grapes and plantains, and data about the cost of production are not available at all. Again, yield naturally varies with variety, and with the locality and standard of cultivation of an orchard. The estimated average annual yield per acre of grapes for the variety Bangalore Blue in Mysore is 11,610 lb. This is the highest average yield per acre in the world. The all-India average per acre per year works out at 7,380 lb., which is somewhat lower than that of California where the average yield of grapes per acre

[1] Dr. Burns—Technological Possibilities of Agricultural Development in India.

[2] Memorandum on the development of Agriculture and Animal Husbandry in India by the Imperial Council of Agricultural Research.

is 7,678 lb.[1] The yield of oranges varies from 50 maunds for Sikkim oranges to 360 maunds for the Sylhet variety in Assam. The average for India works out at 98 maunds per acre as compared with 120 maunds in Palestine and 132 maunds in the United States of America.[1] India stands high among citrus-growing countries in the yield of oranges. No all-India figure for the average yield per acre of mangoes is available, though the mango is among the most important of Indian fruits. In Madras the average yield is stated to be about 80 maunds per acre.

6. The statement below compares the yield of calories and certain food factors per acre in the case of rice, oranges, and mangoes:—

	Rice at 10 mds.	Orange at 100 mds.	Mangoes at 80 mds.
	LB.	LB.	LB.
Protein	68·00	51·2	28·00
Mineral matter ..	5·60	24·4	14·00
Carbohydrates ..	624·00	612·0	541·80
Calcium	0·08	1·8	0·46
Phosphorus ..	1·36	1 2	0·84
Calories per acre ..	1,280,000	1,060,120	1,037,792

On this basis, the calorie yield per acre of the fruits in question compares favourably with that of rice. Two crops of rice, may, however, be obtained annually from land under this cereal so that its caloric return per unit area is actually much greater than the above figures indicate.

7. Baker has attempted to compare the average calorie yield per acre of certain cereals, vegetables, fruits and animal products, when sown under conditions generally prevailing in the United States.[2] The estimated acreage required to produce 1,400,000 calories in the form of wheat, potatoes, and apples was 0·45, 0·76, and 2·35 respectively. This number of calories represents approximately the annual requirement of an average American. Certain varieties of fruit can unquestionably make a useful contribution to over-all calorie requirements, and give a good calorie return per unit area. Plantains and bananas for example are fruits which fulfil both these conditions.[3] Fruits, however, are in general of value in that they supply certain vitamins and add flavour and variety to the diet; they are a supplementary and not a staple food. Their increased production is desirable from the standpoint of nutrition and a larger consumption on the part of the poorer classes—the great majority of the population —would improve their present defective diet. At the same time, as has already been pointed out, it would make some addition to total food supply in respect of calories.

The Growing of Fruit on a Commercial Scale

8. There is reason to believe that fruit production in India has increased during recent years, but this increase has not kept pace with the demand. Before the war there was "a considerable

[1] Reports on the Marketing in India and Burma of Grapes (1940) and Citrus fruits (1943).

[2] Baker, O.E. (1934)—The Future Need of Farm Lands—United States Department of Agriculture.

[3] A further reference is made to plantains as a source of food in Chapter IX of Part III.

import of apples from the United States and Japan, and of grapes and oranges from the United States ".[1] There has been also a substantial import trade in certain types of fresh and dried fruits from Afghanistan. Fruit also came into India in small quantities from Australia and South Africa. This indicates that demand is greater than production and that a market exists which can absorb an increased production of fruit. There is scope for increased production through the better management of orchards, the control of pests and diseases, the improvement of existing trees by top working and budding, and the replacement of inferior by superior varieties. It should be possible to make up for more than the existing deficiency by such improvements. Further, India, with her wide range of climatic and soil conditions, provides opportunities for the cultivation of nearly all the temperate, tropical, and sub-tropical fruits. The variety of fruit grown is enormous. The very best types of mangoes, apples, pears, dates, grapes, oranges, and other fruits can be grown in one part or another of the country. India has a tradition of fruit growing. The Moghul Emperors encouraged fruit cultivation by every possible means, so much so that no revenue was charged for land under fruit culture from the day fruit trees were planted. In days gone by fruit growing was a hobby of the rich and they took pride in the variety of fruits they possessed. Numerous varieties of mangoes—the king of fruits and the fruit of kings—bear testimony to their keen interest. Unfortunately this is not the case now. The present development of horticulture depends largely on the commercial value of the fruit produced. For the success of commercial gardening the essential factors are—

(i) Increased production per acre of fruit of good quality;

(ii) cheap, quick, and reliable means of transport; suitable conditions during transit and suitable storage facilities at the collection centres and at the markets, i.e., development of refrigeration during transit and at destination;

(iii) proper marketing facilities; and

(iv) profitable disposal of culls, damaged and surplus fruit, i.e., development of fruit preservation in its widest sense.

We shall now deal with these various items *seriatim*.

9. Just as the development of indigenous varieties of fruit was due to the interest of connoisseurs, the introduction of superior foreign varieties has been the result mainly of private enterprise. Foreigners who came to India have brought new fruits. European planters introduced varieties of almost all the fruits of the temperate regions into valleys of the Himalayas. Some horticultural societies and Government gardens, as also the Forest Departments, shared in this introduction. From these centres various varieties of fruits spread to different parts of India. It is only lately that Departments of Agriculture have interested themselves in fruit

[1] Sir John Russell—Report on the work of the Imperial Council of Agricultural Research in applying science to crop production in India.

growing and undertaken the introduction of foreign varieties of fruit. One such successful attempt was the introduction of Basra dates into Muzaffargarh (Punjab) by Mr. D. Milne (Economic Botanist). In no other sphere of crop production has the introduction of exotic varieties proved more successful than in that of fruit production. The result is that to-day good varieties of all types of fruit are available in the country and rapid extension is possible through budding, grafting, cuttings, layering, etc. While it is easy to propagate a good variety of fruit tree once discovered, it is a laborious, exceedingly slow and expensive business to produce new varieties. It is, therefore, beneficial to import good varieties from anywhere if they are available. This work can best and most economically be done by a central all-India organization which could also survey the country for new varieties appearing as a result of natural crossing, as bud-mutations and as sports.

Nurserymen

10. While good varieties of all types of fruits exist, reliable agencies, apart from Government fruit farms, for their multiplication and distribution have not been organized. In many parts of the country, nurserymen, selling young fruit stock, are numerous and do a roaring trade. But there is no guarantee as regards the quality of the articles they sell, and years later a grower may discover that he has grown sour lime instead of red-blood *malta* or an inferior mango instead of a *langra*. It is essential that the grower should have a guarantee that the young plants he purchases are of good quality. It has been suggested that all fruit nurseries should be registered and no one should be allowed to sell or distribute fruit plants without a licence. As a general proposition this is not practicable but it might prove feasible in regard to certain fruit trees. This is a point which, we think, is worth investigating. An alternative would be for permission to be given to nurserymen, who are prepared to submit to inspection by experts of the Agricultural Department, to announce that their nurseries are subject to such inspection, and that the plants which they sell have been inspected and approved by the Agricultural Department. We recommend that agricultural departments should use every means in their power to encourage the establishment of " recognized " nurserymen for the production of young fruit trees.

Transport, Packing and Preservation

11. Sir Albert Howard (1924) and Sir John Russell (1937) regard transport facilities as one of the major factors essential for increased fruit production. The Royal Commission on Agriculture (1928) also emphasized this point. Some of the best fruit-growing areas in India are situated in the valleys of the Himalayas, for instance in Kashmir, Kulu, the Simla Hills, and in Assam, far away from railheads. Transport arrangements are very defective. While William pears, equal to the best in the world, can be grown in the Kulu valley, they cannot be transported

outside the valley. In the valley itself they are often sold as cheaply as potatoes. Similarly, Peshawar and Quetta peaches of superior quality cannot be safely transported to other parts of India. There is thus need for quick, cheap, and reliable transport. We hope that after the war, fruit vans, equipped with modern refrigerating systems, will safely carry even the most perishable fruit by rail from one end of India to another. It should also be possible to develop road transport in lorries fitted with refrigerating plants. Even air transport may in due course be utilized. The transport of fruit is a matter which requires immediate attention.

12. Closely connected with the question of transport is that of packing, which should be carefully studied for different types of fruits. So far it has received little attention. The development of cold storage at the assembling centres and at the markets is also necessary for the progress of the industry. Proper marketing is equally essential and involves standardized grading, control of marketing practices, and the elimination of malpractices and excessive profits on the part of intermediaries. These will enable the grower to receive better prices and the consumers to buy fruit at a cheaper rate. Increased profits for growers will automatically lead to better orchard arrangements, improved cultural practices, superior varieties, control of diseases and pests and increased production.

13. We lay particular emphasis on the development of fruit preservation in its widest sense. This is an important link in the chain of successful fruit growing. The use of culls and surplus fruit adds to the income of the grower. Dehydration and other forms of fruit preservation, such as the preparation of jams, jellies and squashes, have made rapid progress during the war years. We recommend that steps should be taken to improve these products and standardize them. Most provinces are alive to this necessity and a Central Fruit Preservation Institute has been established by the Imperial Council of Agricultural Research at Lyallpur (Punjab). This should help to give technical training and develop the fruit preservation industry. Local and traditional methods of preserving fruits in India should also be studied, with special reference to the effect of such methods on nutritive value and the possibility of developing any suitable and economical methods on a wider scale. The final product of preservation must be available at a very cheap rate if it is to be useful to the population at large. The cost of containers adds to the cost of production. Special attention should therefore be paid to the problem of preserving fruit products in a dehydrated form. If it is possible to produce powdered milk, it may be equally possible to produce powdered mango juice and powdered lemon juice. Scientifically manufactured, such preparations should retain a great part of their dietary value.

14. So far no comprehensive authoritative account of the fruits of India has been published providing in a handy form information

on different fruits and the different aspects of the fruit industry. We are informed that the Imperial Council of Agricultural Research has such a project in hand. We recommend that this should be completed as early as possible.

The Growing of Fruit for Local Consumption

15. The need for growing more vegetables in villages for local consumption has already been stressed. The same applies to varieties of fruit which can suitably be grown by individuals in small compounds and 'kitchen gardens.' The protection of certain kinds of fruit against pests is often a difficult problem for the individual grower with a few trees, but such fruits as plaintains and papaya—the latter is a rich source of pro-vitamin A—give good yields under village conditions. In some parts of the country there is a considerable amount of fruit cultivation in villages, but generally speaking, opportunities for such cultivation are neglected or under-developed. We consider that this matter should be taken up by agricultural and other departments concerned with rural development; it is one to which we attach considerable importance, for the production of fruit for local consumption will help to improve the diet of the people.

Summary of Conclusions and Recommendations

16. The main conclusions and recommendations of this chapter are as follows:—

(i) Vegetables help to balance and diversify monotonous cereal diets and fall into the category of 'protective' foods. Many of the common Indian varieties of green leafy vegetables are excellent sources of pro-vitamin A—a vitamin for which the need is considerable, since ill-health and diseases associated with vitamin A deficiency are of frequent occurrence among the poorer classes.

(ii) The present intake of vegetables of all kinds by the mass of the population is inadequate and should be greatly increased.

(iii) The cultivation of vegetables in villages, apart from those in the neighbourhood of cities, is very much neglected. Education and propaganda are required to teach the villager the value of vegetables as food, and to persuade him to grow them for his own use. The growing of vegetables in private gardens and allotments in urban areas should also be encouraged.

(iv) The vegetable farms started by the Provincial Governments in co-operation with the military authorities and by the military authorities themselves have considerably increased production. It is necessary that this increase in production should be maintained after the war.

(v) The increased production of fruit is desirable from the point of view of nutrition and a greater consumption on the part of the poorer classes would improve their present defective diet.

(vi) As in the case of vegetables, the growing of fruit in villages, generally speaking, is neglected or under-developed. This is a matter which should be taken up by the agricultural and other departments concerned with rural development. The more fruit locally grown the better the diet of the people.

(vii) India, with her wide range of climate and soil conditions, provides opportunities for the cultivation of nearly all the temperate, tropical, and sub-tropical fruits.

(viii) While good varieties of all types of fruit exist, reliable agencies for their multiplication and distribution have not been organized. The position in many respects is the same as regards vegetable seeds. It is desirable that the growers of fruits and vegatables should have a guarantee, that the young trees and seeds they purchase are of good quality. It is suggested that, probably the best solution of this difficult problem would be for Agricultural departments to use every means in their power to encourage the establishment of ' recognized ' nurserymen for the production of young fruit trees and vegetable seeds.

(ix) Packing, transport, and marketing are important factors connected with the development of fruit production. These matters require immediate attention.

(x) Stress is laid on the need for development of fruit preservation in its widest sense.

(xi) A comprehensive and authoritative account of the fruits in India should be compiled and published, with the object of providing in a handy form information on the different fruits and the different aspects of the fruit industry.

CHAPTER XI.—FISHERIES

Fish is a food of high nutritive value, being approximately equivalent to meat in protein content and a good source of certain vitamins and mineral salts. In a country such as India, in which *per capita* intake of meat and milk is very small, fish has special importance as a supplement to ill-balanced cereal diets and must be given prominent position in the "protective" group. At the present time the supply of fish is totally inadequate, but the development of sea, estuarine and inland fisheries is one of the most promising means of improving the diet of the people. The question of Indian fisheries and their development has been considered in a recent report prepared by the Fish Sub-Committee of Policy Committee No. 5 on Agriculture, Forestry and Fisheries. We commend the study of this report, which covers every aspect of the subject, to all concerned.

2. Total annual production of fish was estimated in a marketing enquiry carried out in 1941 at 17,930,000 maunds (658,707 tons), of which about one-third was fresh-water fish and the remainder sea fish. On a *per capita* basis, this amounts to 3—4 lb. per annum, or less than 0·2 oz. daily. Two to four ounces daily may be regarded as a desirable intake by fish-eaters who consume little milk or meat. In most parts of the country the greater part of the population has no prejudice against fish as an article of diet, so that requirements of fish are many times greater than existing production. It is no exaggeration to say that fish production could with advantage be increased ten times. Existing production in India may be compared with that in Great Britain, which in peace time amounts to about 40 lb. *per capita* annually.

3. The present lamentable state of Indian fisheries is due to a variety of causes.[1] Sea fishermen are a backward, illiterate and economically depressed community, following primitive and ineffective fishing methods. Sea fisheries extend along the whole of the long coast-line and communications from fishing centres by road, rail or boat are inadequate and often non-existent. There is no organized fish trade except perhaps in the neighbourhood of one or two of the large coastal cities. Methods used in the handling, packing, transport and marketing of fish are primitive, unhygienic and wasteful. Ice is available in limited quantities at only a few centres and cold storage facilities are lacking. Estuarine and inland fisheries suffer from much the same disadvantages as sea fisheries, and no serious attempts at conservation and development have been made. Irrigation schemes have often diminished the value of rivers and streams as a source of fish. There is an almost complete lack of biological data about

[1] A review of pisciculture in India is given in "Agriculture and Animal Husbandry in India, 1938–39".

all classes of fish and no survey of total resources, or even of resources of the most commercially valuable species, has been carried out. Most provincial fisheries departments, as at present staffed and organized, are not capable of dealing with the multiplicity of problems which must be solved if fisheries are to grow and prosper.

4. The basis of a successful and productive fishing industry is scientific knowledge and its application. The Fisheries Sub-Committee rightly points out that short-term programmes for the development of fisheries cannot yield results of permanent value unless they are supplemented by extensive long-term research programmes. Basic biological and ecological research is needed so that resources can be fully estimated, the most valuable fishing grounds discovered and charted, and plans for development based on accurate knowledge of piscine distribution, migration and life history. In countries such as England and United States of America basic research on marine biology has been generously supported by the State and has yielded results not only of scientific but of great commercial value. Other kinds of research are equally necessary. The whole problem of suitable fishing craft and tackle needs investigation, so that improvements in methods suitable to Indian conditions can be devised and introduced. For example, as the Sub-Committee points out, " the types of nets, the materials and the methods of their manufacture and the substances employed for their preservation, are practically the same as they were several hundred years back. While a number of types are very efficient for special classes of fisheries, others are extremely cumbersome and quite uneconomical both in respect of cost and labour, and the catches." To improve inland fisheries, extensive research is needed on fish culture and fish farming, on the relation between conditions in rivers, lakes, tanks, etc., and the reproduction and growth of fish, and a whole host of other problems. On the economic side, more accurate knowledge is required about the fishing community in general, with reference to such questions as indebtedness, the part played by middlemen in the industry, and the possibility of creating co-operative organizations among the fishermen. Communications, transport, marketing facilities, etc., must also be studied. There is also an extensive field for research into economical and satisfactory methods of preserving, processing and transporting fish. The promising fish liver oil industry, initiated in Madras, should be placed on a firmer basis, so that it can meet post-war competition from imported cod liver and vitamin *A* concentrates. This involves the improvement of methods of collecting and extracting the oil, and the development of satisfactory techniques for the production of vitamin *A* concentrates of high potency and good commercial quality. Fish liver oil and fish liver oil concentrates to be used for medicinal purposes should be tested for their vitamin content by a standardized technique before being put on the market. For this one branch of the fishing industry alone, a considerable technical organization, including research workers, is required.

5. Many other items could be added to this extensive programme. The Policy Committee on Agriculture, Forestry, and Fisheries has recommended the establishment of an Indian Central Fish Committee and a Central Fishery Research Institute, the estimated cost of the latter, including two marine and three inland research stations, being about Rs. 60,00,000 including about Rs. 15,00,000 recurring expenditure. Regional research stations in provinces and states will also be required. Among the proposed functions of the Central Institute are the prosecution of many kinds of research, the training of workers and the correlation of research work in the provinces and states. Another recommendation is that the Waterways Board should consider the problems of the conservation of fish and the prevention of pollution in rivers and canals. It has also been suggested that a special Commission of Enquiry should be appointed to investigate the spread of water-hyacinth in the Gangetic delta. This pest, if not eradicated, is likely to damage seriously the valuable inland fisheries of Bengal.

6. The fishery departments of provinces and states, where such departments exist, have in the majority of cases accomplished little because of inadequate staff and resources, and lack of basic scientific data. The Fisheries Department in Madras has been the best organized and most successful, but even this requires to be further developed. We feel that the Government of India must undertake the responsibility of stimulating and co-ordinating the development of the fishing industry. The Indian Central Fish Committee and the Central Fishery Research Institute can fulfil many of the same functions in regard to fisheries as the Imperial Council of Agricultural Research in the field of agricultural development. At the same time the practical tasks of introducing improved methods, organizing the local fishing industry, etc., are a provincial responsibility. If progress is to be made it is essential that Provincial Governments should have, not only a strong Directorate including well-trained experts and the necessary research units, but also an adequate and efficient subordinate ground staff, both on the coast line and inland where the need arises. Top-heavy departments, well-staffed with experts but without sufficient subordinates to do the practical work, are not likely to achieve results. The satisfactory training of the ground staff is a matter of great importance.

7. The lack of trained workers of all grades is perhaps the most serious "bottleneck" to be circumvented in the development of Indian Fisheries. (We may add that the same applies to many other spheres of activity.) Not scores, not hundreds, but thousands of workers will be needed for progress along sound and scientific lines. We note that the Fisheries Sub-Committee has recommended that, pending the establishment of the proposed Central Fishery Research Institute, the Government of India should send, as soon as possible, a sufficient number of State scholars to the Torry Research Station, Aberdeen, to study the preservation and processing of fish. On their return this trained

personnel may be attached to the Fisheries Departments of Madras, Bombay, Travancore and other provinces and states. This covers only one branch of development; there are numerous other problems on which research is required. We feel that numerous promising Indian workers should be sent to fisheries research stations in different parts of the world where suitable facilities for study and research are available. It may also be necessary to employ in India an adequate number of experts from abroad, if these can be obtained, and particularly experts with knowledge of fisheries problems in the tropics.[1]

8. Much of what has been said above concerns the long-term scientific developments of fisheries. It must, however, be emphasized that there is a great deal which can be done immediately. In our Report on Bengal an account was given of existing difficulties in Bengal, where lack of boats, fishing tackle of various kinds, ice, suitable transport facilities, etc., have made fish scarce and dear in a province in which it is an important article of diet. To a lesser extent similar conditions prevail in other parts of the country and there is an immediate need for what, in the case of Bengal, we have described as the rehabilitation of the fishing industry. An increase in the supply of fish during the next few years is very desirable, in view of the present difficult food situation and the scarcity and high price of protective foods generally.

9. The state of the fishing industry, and the far-reaching measures needed to ensure its growth and prosperity, are illustrative of the effort required to develop the resources of the country. On the one hand there is a primitive community using primitive and inefficient methods; on the other potentialities which can be realized only by reorganization on scientific and modern lines. The challenge must, however, be met. We ourselves place strong emphasis on an increased production of fish as a very important part of the programme for improving the diet of the population.

It is clear that, whatever development of sea, estuarine and inland fisheries is achieved, the availability and cost of fish will vary in different parts of the country. The cost at which it can be distributed is of great importance. There seems, however, no reason why it should not become a cheap and abundant article of diet over a large part of India.

10. Our conclusions and recommendations are summarized as follows:—

(i) In India, where the *per capita* intake of meat and milk is small, fish has special importance as a supplement to ill-balanced cereal diets. The present supply of fish is totally inadequate; the development of fisheries is one of the most promising means of improving the diet of the people.

[1] We understand that it is proposed to send about 40 workers abroad for training and to obtain the services of four foreign experts concerned with experimental zoology, hydrography, fish technology and crafts and gear respectively. The latter will be employed for a period of about four years.

(ii) Basic biological and ecological research is needed so that resources can be fully estimated, the most valuable fishing grounds discovered and charted, and plans for development based on accurate knowledge of piscine distribution, migration and life history.

(iii) Other kinds of research are also necessary. The whole problem of suitable fishing craft and tackle requires investigation. Extensive research is needed to improve inland fisheries. Communications, transport and marketing facilities must be studied and investigations made into the methods of preserving and processing fish.

(iv) The fish liver oil industry should be placed on a firmer basis.

(v) The Indian Central Fish Committee and the Central Fishery Research Institute proposed by the Fish Sub-Committee of the Policy Committee No. 5 on Agriculture, Forestry and Fisheries, can fulfil many of the same functions in regard to fisheries as the Imperial Council of Agricultural Research does in the field of agricultural development.

(vi) The fishery departments of provinces and states, where such departments exist, have, in a majority of cases, accomplished little because of inadequate staff and resources and lack of scientific data. If progress is to be made it is essential that Provincial Governments should have, not only a strong Directorate including well trained experts and the necessary research units, but also an adequate and efficient subordinate ground staff.

(vii) The lack of trained workers of all grades is the most serious "bottleneck" to be circumvented. State scholars should be sent abroad to study the preservation and processing of fish and other subjects of importance to the development of the industry and on their return be employed in the provinces and states. It may also be necessary to employ a number of experts from abroad.

(viii) There is also a great deal which can be done immediately to increase the supply of fish. An increased supply during the next few years is very desirable, in view of the present difficult food situation and the scarcity and high prices of protective foods generally.

CHAPTER XII.—VARIOUS MEASURES FOR IMPROVING NUTRITION

The problem of improving the diet of the population as a whole is commensurate with that of effecting a general rise in the standard of living, and embraces every aspect of agricultural and economic development. "Malnutrition," as the Hot Springs Conference put it, "is the close and constant companion of poverty." In this chapter we shall consider certain specific measures for improving the diet of sections of the population. A good deal can be achieved by such measures, even though they leave unsolved the basic problems of inadequate supplies of protective foods and the low purchasing power of the mass of the people.

Nutrition Research

2. We have previously referred to the report of the Nutrition Advisory Committee of the Indian Research Fund Association on "Nutrition in India" (1944). The report deals in some detail with "specific measures" and we propose to draw on it freely. The first point which may be emphasized is the need for research. As the Nutrition Advisory Committee remarks, "active research is a necessary part of any successful attack on the problem of nutrition. All progress is based on research and there is abundant evidence that nutrition research can make valuable contributions to human welfare." Experience shows that active and enthusiastic research organizations are a stimulus and an inspiration to administrative and practical action. They provide a training ground for workers who may be called on to grapple with practical problems, and workers whose main interest is research can often, in an advisory capacity, exercise a beneficial influence on public affairs. The public is in general more willing to listen to the "man of science" when he speaks *ex cathedra*, than to the official propagandist. Further, science not infrequently produces an unexpected rabbit from what appears to be a vacant and unpromising hat. While basically malnutrition is due to poverty, there are unquestionably specific problems of nutrition which might be solved by scientific advance long before poverty can be replaced by prosperity.

We shall not consider the research organizations required for the further development of nutrition research, nor the subjects which require investigation. The Health Survey and Development Committee is concerned with nutrition research in relation to health, and research on animal nutrition is the responsibility of the Imperial Council of Agricultural Research and provincial and state agricultural departments. Research on food technology falls within the purview of the Board of Scientific and Industrial Research and other departments. We confine ourselves here to recommending that nutrition research in all its branches should receive ample encouragement and support.

THE ORGANIZATION OF PRACTICAL NUTRITION WORK.

3. The Nutrition Advisory Committee recommends that "the Central Public Health Department should include a highly trained nutrition specialist with wide experience of the public health aspects of the subject. This specialist will be on the one hand in touch with experts in other branches of public health in the Central Health Department, an on the other with the central nutrition research organization, provincial nutrition sections, and research workers in the nutritional field. He should advise the Central Government on nutritional policy through the Public Health Commissioner." The public health departments of the provinces and the larger states should include a nutrition section in charge of a "nutrition officer" with a suitable staff. The Nutrition Advisory Committee includes the following among the important duties and functions of nutrition sections:—

(i) Study of the composition of foods of local importance.

(ii) Diet surveys.

(iii) Investigations of the incidence of malnutrition and deficiency disease, and of any public health problems associated with nutrition which may arise.

(iv) Apart from these special lines of research, nutrition research generally may be included among the functions of the nutrition section.

(v) The section must pay special attention to the nutrition of "vulnerable" groups, e.g., infants, children, expectant and nursing mothers and students. It should work in association with such branches of public health as maternity and childwelfare and school medical inspection. The nutrition of industrial groups is also a question of great importance.

(vi) The section should serve as an information bureau on nutrition for the benefit of other departments and the general public and be responsible for providing material for education and propaganda. It should advise about diet in public and private institutions

(vii) Nutrition sections should be in close contact with food departments, educational departments and agricultural, animal husbandry, fisheries and marketing departments. They should co-ordinate nutrition work sponsored by local bodies and private organizations

The Committee also recommends that in the public health departments of large municipalities, nutrition work should be developed along similar lines, though on a smaller scale.

Nutrition research and its practical application have in general developed in India in relation to medicine and public health. The newly created central, provincial and state food departments are, however, concerned with problems of nutrition. We may quote here certain resolutions passed at the fifth All-India Food Conference, held in January-February 1945:—

(1) It is essential to improve the diet of the people, and to this end all Governments will undertake an examination of diets in their area, to determine in what respects they are defective and how the defects can best be made good. They will examine especially measures required to provide sufficient milk and other protective foods to the vulnerable section of the community.

(2) The introduction and popularization of foodstuffs which should be added to the diet, or must be substituted for those in short supply, require persistent publicity and active encouragement, including arrangements for practical demonstrations of the preparation of unaccustomed foods.

(3) Use should be made of expert nutrition advice in guiding the policy of central and provincial food administrations.

(4) Large employers of labour should be given every encouragement by Governments to provide canteens for the supply of wholesome cooked food to their labour.

We are glad to note that food administrations are showing an increasing interest in nutrition and that a preliminary programme has been drawn up. With regard to item (3) above, it is clear that the development of a nutritional programme requires the co-operation and assistance of workers experienced in various branches of the subject. In England the Ministry of Food has had throughout the war its own scientific adviser, with a staff of experts, to advise about nutritional policy. It is generally agreed that the Ministry has been very successful in its task of keeping the people well fed; the fact that there has been no deterioration in health throughout the war and indeed an improvement in certain directions is evidence of its achievement. We may, therefore, endorse Resolution No. 3, but would draw attention to certain points of practical importance. In the first place trained nutrition experts to work on a full-time basis in food departments are not at present available in sufficient numbers. Secondly, the question whether nutrition officers in health departments can fulfil the functions of nutritional advisers to food departments needs consideration. There would be certain advantages in food administrations having their own nutrition sections but clearly such sections would to some extent overlap nutrition sections in health departments. Thirdly, since nutrition has a far-reaching influence on public health, public health authorities are concerned with, and should be consulted about, all major questions on nutritional policy. The whole question of the organization of practical nutrition work, which includes the obtaining and training of the necessary workers, is an important one. We feel, however, that it would be premature at this stage to attempt to lay down the lines of future organization. We suggest that for the time being the best possible use should be made of available personnel and other resources, and that there should be close contact between health and food departments with regard to nutrition.

Nutrition Committees

4. It is obviously desirable that there should be some central body to which questions of nutritional policy can be referred. At present such a body exists in the Nutrition Advisory Committee of the Indian Research Fund Association. The Chairman of this Committee is the Public Health Commissioner with the Government of India, and the Director of Nutrition Research is the

Secretary. Among its members are the Agricultural Commissioner with the Government of India, the Animal Husbandry Commissioner, the Education Adviser, the Economic Adviser, the Director of Public Health, Punjab, and a number of experienced nutrition workers who occupy posts in universities, medical colleges, etc. A representative of the Food Department, nutrition officers from various provinces and states, a research worker on animal husbandry, and the Assistant Director in Nutrition, G.H.Q., India, are present by invitation. The United Nations Conference on Food and Agriculture recommended that national nutritional organizations should be composed of authorities on health, nutrition, economics and agriculture, together with administrators' and consumers' representatives. Except that it does not include the last two categories, the Nutrition Advisory Committee resembles the kind of body envisaged by the United Nations Conference.

5. The Nutrition Advisory Committee, which was established in 1936, is technically a sub-committee of the Scientific Advisory Board of the Indian Research Fund Association. The latter is a "local fund," endowed and financed by the Government of India, and controlled by a Governing Body which includes non-officials. One of the tasks of the Nutrition Advisory Committee is to advise on the suitability of applications for grants to carry out nutrition research. Since the great bulk of nutrition research in India is now supported by the Indian Research Fund Association, the Committee has considerable control over nutrition research policy. It has drawn up a programme of future nutrition research which has been circulated to universities, research institutes, etc., as a guide to prospective applicants for grants for research, and helps the Committee itself to reach decisions as to what kind of research should be supported. Apart from its association with research, the Committee has developed into an advisory body which makes pronouncements about important questions of nutrition policy. In its report on "Nutrition in India" it surveyed the whole field of practical development. It is essential that there should be a relatively small central nutrition advisory committee, with a membership such as that of the present Nutrition Advisory Committee, to which nutrition problems of various kinds can be referred. Such a committee can co-ordinate nutrition policy and serve as a link between nutrition workers in health and food departments and those engaged in research, and between nutrition, health and agriculture generally. The existing Nutrition Advisory Committee appears capable of fulfilling this role and there does not seem to be any point in replacing it by another body.

6. We have remarked that various nutritional questions appeared on the agenda of the fifth All-India Food Conference, which was held early in 1945. The same questions were discussed by the Central Food Advisory Council, which met a few weeks later; this Council, which includes non-official members, was created to make suggestions to Government about food policy, and

it also provides a means whereby public opinion with regard to such policy can be sounded. Food administrations, and Food Conferences and Councils generally, have hitherto been concerned with immediate difficulties of food supply, rather than with long-term food and nutrition policy. With the passing of the emergency, the objective of improving the diet of the people must come into the foreground. Hence we may hope that nutrition will in the future be a prominent subject on the agenda of any All-India Food Conferences or Councils which may be convened. Discussions on this subject will require expert guidance which can be provided by adequate documentation and the presence of nutrition experts at the meetings.

The Nutrition Advisory Committee recommends the establishment of Provincial Nutrition Committees " which should include experts on nutritional science, agriculture, animal husbandry, fisheries, marketing, food administration, economics, etc., and advise Governments on questions which concern the nutrition of the population. While their work should be essentially technical in nature, they may also include purely administrative officers, with the object of securing co-operation in their activities from the administrative side." In some provinces the lack of suitable nutrition workers to take part in the work of such committees would make their successful functioning difficult at the present time. What is essential is that provincial administrations, in dealing with questions of food supply and distribution, should give due weight to their nutritional implications. Apart from the establishment of *ad hoc* Provincial Nutrition Committees, this might be achieved by including in Provincial " Food Councils " individuals with knowledge of nutrition, capable of scrutinizing food policy in the various aspects from this particular angle.

Nutrition, Medicine and Public Health

7. We have referred in chapter II, Part II to food deficiency diseases and various pathological conditions associated with malnutrition. The prevention and treatment of diseases of this kind have an important position among specific measures for improving nutrition. Public health nutrition sections have a special responsibility in this connexion. We need not discuss here the various preventive measures which may be followed. The Nutrition Advisory Committee comments as follows: " For example, beri-beri may be prevented by the distribution of pure vitamin B_1, or by popularizing the consumption of certain kinds of rice, osteomalacia by the use of vitamin D, or by changes in social habits involving greater exposure to sunshine, and goitre by the use of iodized salt. Each deficiency disease presents a specific problem of prevention and the most feasible and effective methods of approach can be discovered only by trial of different methods in various areas and groups."

A large proportion of the cases seeking treatment in hospitals and out-patient departments in many parts of the country are

suffering from disease which has its roots in malnutrition. The satisfactory treatment of such patients must be included among specific measures, though in practice the results of the best treatment are often in the long run disappointing, since poor patients on leaving hospital return perforce to their usual defective diet, and recurrence of nutritional disease is the rule rather than the exception.

Supervision of the diet of expectant and nursing mothers and infants is an important public health activity. This can be done through maternity and infant welfare centres, which can supply not only advice but dietary supplements, e.g., milk and vitamin preparations, when these are needed. At the present time, maternity and child-welfare services in India are quite inadequate. Their development and extension are no doubt being considered by the Health Survey and Development Committee. In England and certain other countries achievements in improving the nutrition and health of mothers and infants have been striking. The eradication of rickets in England has been due largely to the distribution of cod liver oil through infant welfare centres, and the instruction of mothers in sound methods of infant feeding has produced excellent results. If a child is to get a good start in life, its mother must be properly nourished, and it must itself receive a satisfactory diet during infancy and early childhood.

The Nutrition Advisory Committee recommends that expectant and nursing mothers and infants should have prior claims on the distribution of insufficient milk supplies. We have referred in our report on Bengal to the scheme in Bombay City whereby expectant mothers and children under six can obtain milk at half price, and commented on the desirability of developing similar schemes in other urban centres.

In the chapter on nutrition we have referred to the exceptionally high mortality among pre-school children, i.e., children aged 1 to 5. Malnutrition is particularly prevalent in this age group. The difficulty of safeguarding the health of the pre-school child is familiar to health workers in western countries; an infant can be looked after by efficient infant welfare services, while a child when it reaches school-age comes under the supervision of school medical services and its diet can be improved by suitable school meals, extra milk, vitamin preparations, etc., should there be need for this. But during the intervening period it is beyond the observation of the public health services. We wish to draw special attention to the need for improving the nutrition of children of this age group in India, though it is by no means easy to suggest practical measures. The education of mothers in child care, such schemes of milk distribution as that initiated in Bombay, and the development of nursery schools in urban areas might in some degree contribute to the solution of the problem.

EDUCATION

8. The Nutrition Advisory Committee considered this subject under three heads: (*a*) the education of specialized workers, (*b*)

the education of those who will be in a position to educate the public or engaged in work in which knowledge of nutrition is of value, and (*c*) the education of the general public.

With regard to (*a*) several kinds of workers are needed, including laboratory research workers, clinical research workers and workers concerned primarily with practical measures for improving nutrition. The education of the first two of these categories need not be discussed here; it overlaps with that of the education of medical and scientific research workers in general, a subject which is being considered by the Health Survey and Development Committee and other bodies. With regard to the third category, we may quote the recommendations of the Nutrition Advisory Committee about the training of public health nutrition workers:

> Specialized public health nutrition workers should receive some training in research methods as well as a good grounding in nutritional science, both in the field and the laboratory. They should have at least a year's training in an institution devoted to nutrition research and other branches of the subject. Some knowledge of statistical methods is desirable. They must also have experience of public health work in general, and in particular experience of health work in rural areas, to enable them to deal effectively with nutrition problems in the field.

Nutrition workers in food departments must also have a sound knowledge of nutrition in its scientific and practical public health aspects. At present, as we have pointed out, there is a shortage of nutrition workers of all kinds. We draw the attention of the Government of India to the need for making satisfactory arrangements for training the necessary personnel in India and abroad.

Professional groups to whom knowledge of nutrition is of practical value include administrative officers in general, officers in food departments, doctors, nurses, school teachers and inspectors of schools, social and economic workers, workers in agricultural and animal husbandry departments, etc. Instruction about nutrition should form part of the normal training of such workers, its amount and kind varying in the different professional groups in question. The medical profession is in a particularly good position to impart knowledge of nutrition to the public, but at present, in the teaching of medical students, the importance of diet to health is not given sufficient prominence. It may be suggested that medical studies should be oriented so that greater emphasis is laid on nutrition. Nurses are also inadequately trained in the subject. We may mention in passing one question which is perhaps somewhat outside our terms of reference—the need for improving dietary arrangements in hospitals. In the United States and other countries large hospitals employ 'dietitians' whose duty it is to organize and superintend the dietary treatment of patients under the supervision of the medical staff, and to ensure that patients receive the best possible diet during their stay in

hospital. There is at present no hospital in India with a 'dietitian' on its staff and in general feeding arrangements in hospitals are bad.

9. We shall now consider the education of the public in general. Since the supply of protective foods is insufficient and the mass of the population cannot afford a balanced diet, the scope for the immediate improvement of nutrition by education and propaganda is limited. A good deal can, however, be achieved by an educational campaign which avoids the error of urging people to eat what is not available and what they cannot afford. Well-to-do people, who could afford a good diet, may through ignorance or long established habit exist on an ill-balanced and monotonous diet to the detriment of health. There is plenty of room for the improvement of dietary habits among the more prosperous classes. India is a country of deep-rooted dietary customs and prejudices, some of which are beneficial and others not. Spread of modern knowledge of nutrition would do something to make dietary habits more flexible, and encourage change and variety. In certain countries—in United States of America, for example—nutrition workers have succeeded in making the public aware of the importance of nutrition—in making them, in fact, what is sometimes called "nutrition-conscious". This has many advantages, even though it sometimes leads to faddishness about food and unnecessary anxiety about potential dietary deficiencies, to the benefit of vendors of patent foods and well-advertised vitamin preparations. But a certain degree of rational and scientific interest in diet on the part of the educated public is desirable. Apart from any effect which such interest may have on personal habits, it is important that the educated classes should understand something of the problem of nutrition and its bearing on the well-being of the country as a whole.

10. We have referred, in our first report, to the replacement of rice by wheat and other cereals. The replacement of part of the rice in the diet of a rice-eater by wheat or millets increases his intake of certain valuable nutrients and is desirable from the standpoint of nutrition. This is particularly so when the rice consumed is raw milled rice. As regards food policy in this matter, there are other considerations. The shortage of rice in various rice-eating areas during the last few years has made it necessary to encourage the consumption of alternative cereals in these areas. It is clearly advantageous, from the standpoint of food policy, that rice-eaters—or at least a proportion of rice-eaters—should be ready to turn to other cereals if need arises. Well-to-do rice-eaters in certain parts of the country are becoming accustomed to take some wheat daily as an alternative to rice, a habit viewed with favour by nutrition experts. Sections of the poorer classes—again in certain areas—consume either millets or rice or both, usually with a preference for rice, in accordance with the price and availability of these cereals. Flexibility of cereal intake on the part of the community at both ends of the social scale is a useful safeguard

against periods of rice shortage, and where it already exists it can be further encouraged. In areas such as rural Bengal, where the great bulk of the population is used to taking only rice and is unfamiliar with other cereals, the popularization of the latter is particularly difficult. The need for furthering the consumption of other cereals in rice-eating areas depends on the supply position but in general rice is likely to be in short supply in certain parts of the country for some years. It may be noted that the partial substitution of rice by alternative grains, made necessary by the food situation, has certain advantages from the standpoint of nutrition, and hence education and propaganda based on nutritional grounds can be used in support of food policy.

11. The Nutrition Advisory Committee suggests a number of methods of spreading knowledge of nutrition. These include pamphlets, posters, bulletins, press articles, films, wireless talks, demonstrations, exhibits and museums. All these have their place, but more is needed than visual and verbal propaganda. Demonstration is the most effective method of education. Suitable recipes must be devised and popularized by sale in canteens, Government restaurants, etc. It is important that any kind of meal or dish which is advocated, should be generally acceptable and not such that its preparation is a physical impossibility. This means that, before any educational campaign by demonstration or any other method is undertaken, the habits of the people and the facilities for adopting unfamiliar methods of preparation and cooking must be investigated. For example, if people do not possess stone *chakkis* or grinders, as in Bengal, they cannot grind whole wheat into *atta*. Those concerned in the campaign must in fact be very fully informed about local domestic habits and prejudices. We have pointed out in our Report on Bengal that women are particularly suited for undertaking educational work in the field of nutrition and would again stress the need for enlisting their services. In this connexion the need for developing institutions for teaching domestic science may be emphasized.

"All children", the Nutrition Advisory Committee points out, "should be taught simple facts about food and diet, as part of health education". Books and booklets generally suitable for the instruction of children already exist; no doubt, however, these could be improved upon. Attractive educational material, written in English and the important Indian languages, should be provided for use in schools. We may again observe that demonstration is more effective than precept. Properly organized school-feeding, to which we shall refer in a later section, may be of considerable educational value.

The Milling and Preparation of Cereals

12. Since cereals form the bulk of Indian diets, the treatment which they receive before consumption, and its effect on their nutritive value, are an important matter. The outer layer of cereal grains—the germ and pericarp—are richer in certain vitamins and other nutrients than the starchy interior of the grain and if these layers are removed by milling, the resulting product

is nutritionally inferior to the whole cereal. We may recall the careful attention which has been given in England during the war to the composition of the flour from which the staple cereal food of the country, bread, is made, and the decision, after a preliminary period in which refined white flour was reinforced with vitamin B_1, to make the use of 85 per cent extraction flour compulsory. Flour of this extraction resembles whole wheat in its nutritive properties, and its use during the war period has no doubt played a part in keeping the health of the people of England, whose diet has been restricted in other ways, at a high level. In the United States of America, on the other hand, refined white flour is generally used for bread-making, but this is "fortified" by the addition of several synthetic vitamins, to make its composition, in respect of these vitamins, approximately the same as that of whole meal flour. In both countries, bread and flour form a much smaller proportion of the diet than the various staple cereals do in India.

These examples show that the composition of cereals may be an important aspect of state nutrition policy. We must, therefore, enquire into the position in India. The staple cereals of the country are rice, wheat and the various millets, barley and maize being of much smaller importance. As regards wheat, nearly all the wheat flour consumed is ground in *chakkies* or mills to give a product—*atta*—which retains most of the outer layers and nutritive value of the whole grain. Refined wheat flour is also produced in modern roller-process mills and used for bread-making, but only a small percentage of the urban population eats white bread. Most wheat-eaters live on *chappaties* made from *atta* and this is, nutritionally speaking, an excellent habit. If the use of white bread increases then some action along the lines of that taken in other countries might be called for. At the present time white bread-eaters in general belong to the more prosperous classes, and their consumption of bread, in proportion to that of other foods, is low, so that they do not depend on bread to supply their requirements of vitamins and other nutrients.

Barley and maize are consumed "whole", or nearly so, after grinding. The preparation of millets for consumption also involves little loss of nutritive value; actually the mere size of the millet grain would render the removal of the more nutritious part of the grain, by any milling process, difficult or impossible. We may say that, as in the case of wheat, no milling problem at present arises in respect of these cereals.

13. The question of rice-milling requires more attention. At the beginning of the century it was shown that the serious disease beri-beri is caused by the consumption of a diet of highly-milled rice, deprived of its outer layers and hence of what was subsequently called the "anti-beri-beri" vitamin (vitamin B_1). Since then much has been written about the rice problem, and numerous scientific investigations have been carried out. There is no question that highly milled "raw" [1] rice is a defective food, and that

[1] The term "raw" rice means here rice that has not been par boiled.

its consumption as the principal article of diet involves danger of beri-beri and other deficiency diseases. Beri-beri is not, however, a common disease in India, except in one considerable area in North-East Madras—the Northern Circars. There are two reasons for this. First, the majority of rice-eaters in the country as a whole eat home-pounded rice from which the outer layers are only partially removed; according to the Report of the Agricultural Marketing Adviser on "The Marketing of Rice in India and Burma" (1941), "something like 73 per cent of the rice produced and consumed in India is hand-pounded, very largely by the growers themselves by whom or by whose family members, the paddy is husked manually in the household for their own domestic requirements". Secondly, more than half the rice eaten in India is parboiled—i.e., steamed in the husk—a process which, as careful scientific research has shown, leads to a diffusion of the vitamins contained in the outer layers through the grain, so that they are not removed when the rice is subsequently milled. Parboiled rice milled to a fairly high degree, which until recently was widely consumed in South India, has most of the nutritive properties of "whole" rice and those who eat it rarely get beri-beri. In the Northern Circars "raw" rice, i.e., rice which has not been steamed in the husk, is preferred by all sections of the population, and in this area mills abound so that machine-milled raw rice is the staple diet. In most other parts of the country the poor use either hand-pounded rice (parboiled or raw), or, if they consume machine-milled rice, consume it in the parboiled state. The well-to-do usually prefer machine-milled raw rice to other kinds of rice, but since their diet is relatively varied and they eat less rice and more of other foods than the poor, they are in less danger of deficiency disease. These facts taken together explain the peculiar geographical incidence of beri-beri in India.

14. A new factor in the situation is the introduction by various Provincial Governments of "Rice-Milling Orders" prohibiting the milling of rice beyond a certain degree. The primary object is to increase the yield of rice from a given quantity of paddy. In the case of parboiled rice the effect on nutritive value is not very striking, but under-milled raw rice is appreciably richer in vitamins, etc., than highly-milled raw rice. The question whether the Rice-Milling Order promulgated by the Government of Madras in 1943 has reduced the incidence of beri-beri in adults and infants in the Northern Circars requires investigation.

We feel that the present policy of limiting the degree to which rice is milled is justified and should not be abandoned when the war is over and the food situation is easier. It is true that, owing to the widespread use of home-pounded and parboiled rice, the effects of under-milling in improving the nutrition of the rice-eating population as a whole, are limited. A considerable proportion of rice-eaters, however, consume machine-milled raw rice, and the improvement in the nutritive value of such rice resulting from under-milling should be of definite benefit, particularly to raw rice-eaters of the poorer classes who are in danger of getting beri-beri. We are aware that there is a general preference for

highly-milled rice on the part of those who consume machine-milled rice (particularly on the part of the well-to-do classes) and that under-milling raises in practice certain difficulties. Under-milled rice does not keep as well as highly-milled rice, and has a less attractive appearance. Again the enforcement of under-milling may have the effect of lowering the *commercial* quality of rice turned out by mills. Whereas highly-milled rice is a "finished" article, under-milled rice, in the eyes of the miller, is not, and standards as regards homogeneity of variety and degree of milling, taste, appearance, etc., tend to be lower in the case of under-milled than of highly-milled rice. Many of these drawbacks can, however, be removed by a well-organized system of inspection and distribution, and we feel that a return to the previous position with regard to rice-milling would be a retrograde step.

15. Two other points may be mentioned. A method of preparing rice for consumption known as "rice-conversion" has recently been developed in the United States. "Conversion" is essentially a refinement of the time-honoured Indian practice of parboiling; instead of being steamed at atmospheric pressure and dried in the sun, as in the parboiling process, "converted" rice is steamed under pressure and subsequently dried in a vacuum chamber. Rice so treated can be milled to give a white highly-polished product of attractive appearance and taste which has the same nutritive properties as milled parboiled rice, i.e., it retains on milling the vitamins present in the whole grain. "Conversion" has the advantage of giving a higher yield of finished rice from a given quantity of paddy than other methods, since the proportion of broken grains is greatly reduced. We recommend that the production of "converted" rice should be given a trial in India. The plant which has been devised for the process in the United States of America is somewhat elaborate and expensive, and it would probably be necessary to devise cheaper and simpler plant, embodying similar principles, for use in India. In the first instance two or three mills could be equipped with "conversion" plant, and the whole question of the introduction of "conversion," including the acceptability of the finished product, studied on an experimental scale.

16. Rice is the only cereal which is washed before consumption. Washing unfortunately removes a proportion of the various nutrients previously present which are soluble in water; for example, the washing of raw rice reduces its vitamin B_1 content by 60 per cent. The effect of washing on parboiled (and "converted") rice is less pronounced, a fact which has an important bearing on the beri-beri-preventing properties of such rice. Some loss of nutrients also occurs in the cooking of rice, its degree depending on how far the water used in cooking is discarded.

The first washing of rice causes the greater part of the loss of nutrients in the household preparation of rice, and there is little to be gained by reducing the number of washings. The habit of washing rice before cooking is universal, and since most rice as

purchased contains dirt and extraneous matter it is difficult to see how washing can be avoided. Conceivably, rice could be stored and marketed in such a state of cleanliness that no washing would be required. There is no obvious solution of this problem, but the fact remains that an appreciable proportion of the total quantity of nutrients available in India is washed away in millions of households every day. With regard to losses due to the rejection of cooking water, efforts should be made to teach rice-eaters who follow this habit, to use a minimum quantity of water in cooking and consume the cooking water or " conjee."

School-feeding.

17. Of all specific measures for the improvement of nutrition, this is perhaps the most likely to produce results. Growing children need abundant wholesome food, and their health and physical development suffer if they do not get it. Many children in primary and secondary schools in India are malnourished; they are thin and undersized for their age, and often show signs of food deficiency disease. Children may leave home for school in the morning after taking an insufficient breakfast, or even no breakfast at all, and get nothing substantial to eat until the evening. Hungry children cannot do their school work properly. An experienced school teacher will usually know which of the children in the class are seriously malnourished, because of their apathy and inattention.

The value of school-feeding has been stressed in the report of the Central Advisory Board of Health on " The medical inspection of school children and the teaching of hygiene in school " (1941) and in the " Report of the Central Advisory Board of Education " (1943) popularly known as the " Sargent Report." The latter comments as follows:—

> One of the main causes of health defects in this country is malnutrition. The condition may be due to under-nourishment or an unbalanced diet or both. As regards under-nourishment the provision of a mid-day meal in school is recognized to be a good thing both for combating malnutrition and for enabling children to benefit by the lessons imparted at the end of the school day. If properly organized, it also affords a valuable opportunity for social training. In many provinces brave efforts have been made to provide mid-day meals or other supplementary nourishment but finance has restricted these to a limited number of areas only, and children in the primary stage on account of their large numbers have usually been left out. The effects of malnutrition in primary school children are not less serious than in children of higher ages. All the children should be given a mid-day meal, whether it is brought from their homes or provided at the school. Parents able to pay should contribute to the scheme.

We agree with these findings and recommendations. Ideally the food or meal provided in schools should be such as to make up for quantitative and qualitative defects in the home diet. In the qualitative sense, no food is as good as whole milk. Unfortunately in most parts of the country sufficient supplies of milk are not available for distribution in schools on a large scale, and the cost

of supplying milk even in limited quantities would be high. The Nutrition Advisory Committee points out that, while milk is the best supplement, recourse may be had to other foods. "These include skimmed milk and sprouted pulses. Almost any food which supplies additional calories to under-nourished children is of value."

18. While the value of school-feeding is generally recognized, there are serious difficulties in organizing it on any extensive scale. In the first place, the cost is very considerable. The minimum cost of a meal of genuine value would be 1–2 annas per child daily, and expenditure at this level in poor elementary schools would more than double the existing cost of education. On the other hand, expenditure could be kept down by confining feeding to schools in which the children are particularly poor and malnourished, or to children within certain schools who are in special need of additional nourishment. Part of the expense can be borne by parents who can afford it. It may be emphasized that money spent on school-feeding is money well spent, since school-feeding improves the health of the rising generation and helps to produce stronger and better-educated citizens.

Apart from the question of finance, the organization of school-feeding is by no means a simple matter. In large cities the corporation or municipality supports, usually with assistance from provincial resources, most of the primary schools and perhaps one or two secondary schools. Some schools of both kinds are run by private bodies with or without a grant-in-aid from the Provincial Government. A small number of secondary schools may be completely supported by Government. In smaller municipalities and the districts generally the local bodies concerned are responsible for most primary schools, secondary schools being usually run by private organizations with or without the help of a Government subvention. Here also a number of secondary schools may be completely supported by Government. There is no uniform, centrally controlled system, embracing all schools, on to which a uniformly organized system of school-feeding could be grafted. The approach to the problem would be determined by local conditions.

19. In cities responsibility for developing school-feeding must rest largely with the corporation or municipality, whose chief education officer, assisted by the necessary staff, could be entrusted with general management. The best method of procedure is probably that the food should be cooked in a central kitchen and distributed by motor van to the schools; this is the practice in Madras City, where the corporation has supplied free meals to certain of the poor schools in the City for a number of years. A committee including a few public-spirited citizens, doctors, etc., might exercise some general supervision over the organization of school-feeding, and the creation of such committees would help to stimulate public interest. Health departments, both provincial and municipal, should be associated with school-feeding schemes,

and nutrition officers in these departments could give advice and assistance. At present only a few of the larger municipalities employ school-medical officers; such officers, where they exist, would be concerned with school-feeding and its effect on the health of the children. Arrangements could be made for schools not controlled by the urban authority to participate in school-feeding schemes.

20. In smaller municipalities and the districts there is no educational staff apart from itinerant inspectors of schools in Government employ, and the school teachers themselves. The inspectors could not undertake the organization of school-feeding in addition to their educational duties. To entrust it to poorly paid school teachers under inadequate supervision would give rise to obvious difficulties. In large urban areas school-feeding may be under the general control of the Chief Education Officer, but special staff would be needed to carry out the day-to-day work, including the purchase of the necessary foods, etc. Similarly in small towns and in the districts a special staff would be needed for school-feeding. In many towns it would probably be convenient to supply the midday meal at a central place to children during the school interval rather than in the individual schools. The children could attend this centre armed with a card signed by the headmaster of their school. Here again local committees might be formed to consider and supervise arrangements. Administrative officers of various grades and health officers would also be responsible for general supervision.

21. We have dwelt at some length on the organization of school-feeding because we feel that the difficulty of initiating satisfactory schemes is not generally realized. It is one thing to recommend school-feeding as a most desirable measure and another to put the recommendation into practice. The whole question is in fact a complicated one which demands careful preliminary study, and which in the initial stage would have to be approached by trial and error. We suggest that in the first instance efforts should be made to develop school-feeding in large cities, where there are numerous poor children in need of additional nourishment. At the same time experimental schemes could be undertaken in selected towns and rural areas, at first on a relatively small scale. The difficulties of organizing school-feeding on a wide scale are, in our opinion, by no means insuperable. Two years ago the rationing of large urban populations in India seemed to many an impossible task but to-day, as the result of praiseworthy efforts on the part of food departments, rationing schemes are working fairly smoothly. Similar success could doubtless be achieved in the case of school-feeding.

22. Some further comments may be added. A large proportion of children of school-going age do not at present attend school, and would not be benefited by any system of school-feeding. One of the effects of supplying free meals is to increase school attendance, which is of course desirable although it may raise problems of accommodation. The possibility that some parents of children

receiving food through schools may correspondingly reduce the amount of food given to the children at home must be borne in mind, but in our opinion few, if any, parents would be likely to take advantage of school-feeding in this way. We have referred above to payment by parents who can afford it; probably it would be better to supply school meals free in the initial stages, and if school-feeding proves successful and popular to seek contributions from some parents. With regard to the type of food or meal to be provided, this will vary according to season and locality and should be considered in consultation with the nutrition experts. Advantage can be taken of school-feeding to increase the offtake of cereals other than rice, in rice-eating areas where supplies of rice are deficient, by supplying palatable preparations of wheat or millet. It should be possible, at least at certain times of the year, to grow in school compounds vegetables of various kinds which could be used to enrich and enliven school meals. The development of well-cultivated school gardens, tended by the children themselves, is not an impracticable proposition.

Before the war, dried skimmed milk from Australia and New-Zealand was used quite widely in supplementing the diet of children in institutions. In 1938, on the recommendation of nutrition experts, the import duty on such milk was reduced from 30 to 10 per cent. It was in general cheaper than fresh milk locally produced, and feeding experiments showed that it had excellent effects on the health and physique of children. Dried skimmed milk is now for practical purposes unobtainable, but after the war it will presumably come on the market again. Since the milk supplies of India are inadequate there would be justification for encouraging the import of this valuable by-product of the Australian and New-Zealand butter industry. It could, if available at cheap cost, be used in school-feeding.

23. Finally a word may be added about diet in residential institutions, particularly those for children. All children in boarding-schools, orphanages, etc., whether these are under State or private management, should receive as good a diet as possible. While the provision of a fully satisfactory diet including milk may often be impossible owing to insufficient funds, institutional diets can usually be improved by making better use of available resources. This involves some interest in, and knowledge of, dietetics on the part of those responsible for institutional feeding. Within recent years, as a result of the educational efforts of nutrition workers, the diet of many institutions has been improved with good effect on the health of the inmates. At the present time, however, the high price of all kinds of foods makes it extremely difficult to provide a satisfactory diet in institutions with scanty funds.

Reference has already been made to the fact that one of the duties of public health nutrition sections should be the provision of advice about diet in institutions, which include institutions for adolescents, students' hostels, reformatories, gaols, etc., as well as children's boarding schools.

THE FEEDING OF EMPLOYEES AND LABOUR GROUPS

24. The Indian Army is excellently fed. Recruits in a poor state of nutrition rapidly put on weight and in less than a year, as a result of good food and physical training, are transformed into alert, hardy and well-developed soldiers. We need not dwell on the achievements of the Indian Army from Rangoon to Bologna; they are well known to the world. We mention the Indian soldier because he illustrates the fact that physical standards and capacity for work and endurance which are accepted as "normal" among the general population are in fact grossly sub-normal, and because he demonstrates in his person the great possibilities which exist in India for the improvement of health and physical development by better diet and other means.

Industrial workers stand in contrast to the soldier. Their output of work is in general low and ill-health of various kinds impairs their physical efficiency. We know of no records of absenteeism in labour groups resulting from ill-health but have little doubt that investigation would show that the loss of working hours due to this cause is very serious. If India is to develop into a great industrial country, competing on equal terms with the other industrial countries of the world, great efforts must be made to improve and safeguard the health of industrial workers. Good food is essential to good health and hence the diet of workers is a matter of great importance.

25. In Chapter II of Part II we have discussed the relation between income and diet and it was pointed out that intake of protective foods rises with increasing income. The minimum wage paid to industrial workers should be such as to enable them, after other commitments are met, to purchase a reasonably adequate diet for themselves and their families. The cost of such a diet is of vital importance in connexion with the concept of a minimum adequate wage. The acceptable level of diet would tend to differ in different localities, and from time to time, in accordance with the availability of foods and numerous other factors, but it could be established without much difficulty in consultation with nutrition workers. The principle involved is a thoroughly sound one. Quite apart from the question of a *balanced* diet, the situation may arise in which it can be clearly shown that the wages of certain types of workers are insufficient to enable the recipients to buy *enough* food to cover their calorie requirements. The payment of starvation wages, whatever the state of the labour market, is unjustified on moral grounds, and, further, the under-fed labourer is an uneconomic proposition because of his low output of work. In considering the whole question of improving the diet of industrial workers, we cannot too strongly emphasise that such workers must be adequately paid, so that they can feed themselves and their families according to a reasonably high nutritional standard and maintain their health and physical efficiency.

26. In England industrial canteens have been most successful and at an Industrial Conference in 1943 it was recommended that

war-time arrangements for providing a balanced meal to industrial workers should continue after the war is over. The development of well-run canteens associated with industry is desirable from the standpoint of nutrition, since canteens can help to satisfy the special needs of industrial workers and can also be used for educational purposes, e.g., in the popularization of unfamiliar foods. It must be admitted that little progress has so far been made, except in one or two centres, and that at present the idea does not appeal to industrialists in general, nor indeed to the workers themselves. The reasons for and against require careful examination. It is possible that once initial difficulties, inertia and conservatism were overcome, canteen feeding would become highly popular among industrial workers and also among employers because of its good effect on the efficiency of their employees. We may include among the labour groups concerned not only workers in factories, but also the secretarial staffs of large business houses in cities.

" Fair price " shops and co-operative stores can be of great value to employees, preventing their exploitation by unscrupulous traders. The satisfactory feeding of labourers in plantations, and isolated labour groups in rural areas, presents a special problem; in this case the most serious difficulties may be those of supply. Responsibility rests with governments and employers to ensure that adequate food supplies are available to such workers, particularly in areas in which local supplies are insufficient or non-existent. The encouragement of vegetable growing on plantations is a useful practical measure.

27. A word may be added on the subject of " state restaurants." In England the " British Restaurants ", created and controlled by the government, have proved most useful and popular during the war period. They supply a well-cooked meal at cost price to all-comers, and have been patronized by all sections of the community. The actual cost of a square meal is about a shilling. In India a " nutrition restaurant ", supplying nutritious and well-served food at cost price, has been organized by the itinerant War Services Exhibition and has proved strikingly and perhaps unexpectedly successful. Caste restrictions have not prevented visitors of different communities from enjoying its amenities. In Cochin, state restaurants, the primary object of which is to increase the offtake of foods other than rice, have also been a success. We understand that the Food Department of the Government of India is contemplating the creation of government restaurants for the benefit of the general public, in the first place in large urban centres. The project has much to recommend it, though only experience will show how far it will prove practicable and successful. Well-run government restaurants supplying cheap and well-balanced meals would benefit urban workers of various kinds and could play a part in the educational campaign for better diet.

28. The nutrition of industrial workers could be substantially improved by measures such as those suggested above and others. Industrial workers are, however, a comparatively small group in

relation to the whole population of India. To raise standards of nutrition among agricultural labourers in rural areas is a much more extensive problem, to which we have referred in other sections of the report. While in this chapter emphasis has been laid on the feeding of industrial workers, we fully recognize that the needs of the vast group of rural labourers not employed in organized industry are equally pressing.

Food Industry

29. In a country such as U.S.A. most foods are " processed " in factories before reaching the consumer, and industries concerned in the preparation of foods in various ways have been developed on a large scale. In India some common foods may be described as " processed "; examples are milled rice, various kinds of wheat flour, *vanaspati* and refined sugar. The bulk of the population, however, at present lives on foods which are obtained directly from the soil and are prepared for consumption by village and household methods. There are no large industries occupied in transforming familiar cereals into " breakfast foods ", to be distributed to consumers in cardboard cartons with attractive labels suggesting that the contents are of exceptional nutritive value. The preservation of food is in general effected by similar simple methods. Thus, fruit is dried in the sun to preserve it, instead of being canned, dehydrated, used for the extraction of juice, or treated in other ways in factories.

It has been suggested that the development of food industries is an important method of improving diet in India. Unquestionably such development would be attended by certain advantages. The Nutrition Advisory Committee points out that it would provide " a steady market for various food products, facilitate the storage and distribution of perishable foods such as milk and fruits (we may add vegetables), enable full advantage to be taken of seasonal abundance thus minimising wastage, and help to fill gaps in the supply of various kinds of foods in areas and seasons in which there is a shortage. The processing of perishable foodstuffs during local and seasonable gluts is in the long run beneficial to consumer and producer alike, since it helps to maintain an even flow and price throughout the year and saves waste. The importance of developing the manufacture of processed milk products, thereby furthering the development of the dairy industry, may be emphasized ". The growth of food industries would also have the general effect of introducing more efficient methods for the storage, transport and distribution of food.

The development of food industries, as part of the general industrial development of the country, is unquestionably to be recommended. It must, however, be pointed out that processed foods are usually more expensive than the natural product and tend to be purchased by the well-to-do rather than the poor, and used for urban rather than rural consumption. Whatever the growth of industry and urbanization, India must remain predominantly a

country of cultivators, consuming the foods to which they have long been accustomed and which, as far as bulk of the agricultural population is concerned, they have themselves produced. For these and other reasons, we regard the creation of food industries as a matter of somewhat secondary importance in relation to the fundamental problems of nutrition and food supply which form the main theme of our report.

30. Brief mention may be made to products of high nutritive value which are of value in supplementing defective diets. We have referred elsewhere to the production of fish liver oil and vitamin A concentrates from such oil; this, we have pointed out, should be energetically pushed forward. The Government of India are planning the manufacture of "food yeast" from molasses, with a production target of 3,000 tons annually. In this process protein and vitamins are synthesised from a relatively valueless carbohydrate product of which a surplus normally exists in India. The strain of yeast used for the purpose is a variant of *Torula utilis*, developed by research workers in England during the war, which gives high yields when grown in molasses solution, and can be dried into a flaky powder which, if not highly palatable to the normal taste, is at least inocuous. Dried yeast is very useful in the treatment of hospital patients suffering from deficiency states, and it can be introduced into institutional diets. The popularization of food yeast as a supplementary food for consumption by the public may, however, be somewhat difficult. Apart from food yeast, there is the possibility of producing concentrated preparations of high nutritive value from various foods grown in India.

31. To-day most of the important vitamins have been indentified and synthesised, and can be manufactured in bulk at relatively low cost. There is a boom in vitamin pills and tablets, and in the United States of America the vitamin industry has become an industry of major importance. In some countries, e.g., in England and the United States, synthetic vitamins and vitamin concentrates have been incorporated in certain of the staple foods of the population. The Nutrition Advisory Committee comments on the subject as follows:—

> Vitamin deficiency states of various kinds and degree are common in India and unquestionably large sections of the population would be benefited in health by taking synthetic vitamins. Various deficiency diseases could be prevented by their administration. The use of synthetic vitamins in making good obvious deficiencies in the diet of the vitamins in question is clearly a rational procedure. The administration of vitamins can be combined with that of various minerals, e.g., calcium and iron, when the diet is deficient in such minerals, or (in the case of iron) requirements are increased by blood destroying diseases . . . The development of the manufacture of synthetic vitamins in India is recommended.

We are in agreement with this recommendation. Synthetic vitamins, either manufactured in India, or, pending this, imported in bulk and made into pills and tablets locally, would be of genuine

help in making good dietary deficiencies. The part which can be played by food yeast, vitamins, etc., in solving the problem of malnutrition as a whole must, however, be viewed in its true perspective. Their production on a large scale and increased availability would not obviate the need for producing enough food to meet the requirements of the growing population, and their distribution, particularly in rural areas, would present great difficulties. If vitamin pills are given to under-nourished school children, a meal supplying additional calories must also be provided. Full use must be made of all the resources of science for the improvement of diet, but we see a certain danger in giving undue prominence to measures which, however valuable on a limited scale, leave the basic problem of increasing the supply of energy-yielding and protective foods unsolved.

Food Standards and Food Control

32. "Food as purchased by the consumer should be uncontaminated and unadulterated and conform to the description given or implied by the vendor. The effective control of food adulteration is an important part of food policy. Satisfactory standards for certain types of foodstuffs, natural and processed, must be laid down and vigorously enforced by legal action." Here again we quote the Nutrition Advisory Committee.

The problem of ensuring that foods which are distributed, bought and consumed are of good *quality* is an extensive one which we cannot consider in detail. The term "quality" has here a wide connotation, covering such matters as the appearance, freshness and freedom from "mustiness" and insect infestation in the case of cereals, freedom from adulteration with hydrogenated vegetable fat in the case of *ghee*, a safe and unadulterated milk supply, the freshness of eggs, etc. The control of foodstuffs to ensure their good quality and purity is largely, though by no means entirely, the responsibility of public health authorities. Food Adulteration Acts have been passed in various provinces, but their enforcement is at present unsatisfactory. For example, a large proportion of the animal *ghee* sold in India is heavily adulterated, and in most cities it is difficult to obtain milk which is free from added water. The fate of the average consumer with regard to the quality of the foods he purchases, may be contrasted with that of the soldier in the army, who is supplied only with foods subjected to a careful system of inspection by which all supplies not conforming with rigid standards of quality and purity are rejected. If the food industry develops, the need will arise for ensuring that purchasers are not misled by extravagant claims for their products on the part of manufacturers. In some countries the advertisement of food products is partially controlled by the public authorities. It is obviously undesirable that poor people should be induced by skilful advertising to spend money they can ill afford on expensive preparations which are of no remarkable nutritive value.

Marketing has an obvious bearing on the quality of foods. The Agricultural Marketing Department of the Government of India has made some valuable studies of existing marketing arrangements and has introduced " agmark " standards for various foods. These useful activities should continue. In the case of milk and milk products, for example, improvement in marketing arrangements is essential if they are to be distributed to consumers in a satisfactory condition, and also for the development of the dairy industry generally.

We can do no more here than draw attention in a general way to these various questions and emphasize the fact that control of the quality of foods in the broadest sense of the term is an essential part of a progressive food policy which has as its objective the improvement of nutrition.

Conclusions and Recommendations

33. The conclusions and recommendations of this chapter may be summarized as follows:—

(i) Nutrition research in all its branches should receive ample encouragement and support.

(ii) Specialized nutrition workers are needed in public health departments and to guide the activities of food departments in their nutritional aspects. Close contact between public health departments and food departments with regard to nutrition problems is necessary. Arrangements should be made for the education and training of more specialized nutrition workers for research and practical nutrition work.

(iii) There should be a small technical all-India Nutrition Committee to which questions of nutrition policy can be referred. The existing Nutrition Advisory Committee of the Indian Research Fund Association is suitable in composition for this purpose.

(iv) Methods of preventing deficiency diseases should be investigated and a vigorous attack on such diseases launched by public health authorities. Supervision of the diet of expectant and nursing mothers and infants is an important public health activity. This can be done through maternity and child-welfare centres which can supply not only advice but also dietary supplements, e.g., milk and vitamin preparations, when these are needed. The improvements of the diet of pre-school children is also of special importance.

(v) Instruction in the subject of nutrition should be part of the normal training of professional groups who will be in a position to educate the public, or engaged in work in which knowledge of nutrition is of value. These include administrative officers in general, officers in food departments, doctors, nurses, school teachers and inspectors of schools, social and economic workers, workers in agricultural and animal husbandry departments, etc. The amount and kind of instruction will of course vary in the different groups. The medical profession is in a particularly good

position to impart knowledge of nutrition to the public, and medical studies should be oriented so that greater emphasis is laid on this subject.

(vi) The education of the public should be pushed forward by all available means, though it is useless urging people to eat what is not available and what they cannot afford. Visual and verbal propaganda must be reinforced by practical demonstration. Women are particularly suited for carrying on education work in the sphere of nutrition. All children should be taught simple facts about food and diet, as part of health education.

(vii) Cereals form the bulk of Indian diets, and hence the treatment which they receive before consumption and its effect on their nutritive value, are important questions. Most wheat is consumed in the form of *atta* which possesses most of the nutritive qualities of whole wheat. Barley, maize and the millets are eaten " whole " or nearly so. Highly-milled raw rice lacks certain important vitamins and its consumption as a staple food, with little else in the diet, leads to danger of beri-beri. Most rice-eaters in India consume home-pounded rice, raw or parboiled, or machine-milled parboiled rice, and rice in this form retains most of the vitamins of the whole grain. There is a considerable area in North-East Madras where machine-milled raw rice is the staple food of the population and here beri-beri is a serious problem.

The present policy of limiting the degree to which rice is milled is in general justified and should not be abandoned when the food situation is easier. Attention is drawn to the very considerable loss of nutrients which occurs when rice is washed before household use. The method of preparing rice for consumption known as " conversion " should be given a trial in India.

(viii) The development of school-feeding is strongly advocated. Many children in primary and secondary schools in India are under- and mal-nourished and in consequence cannot do their school work properly. School feeding on any considerable scale is expensive; its organization is by no means easy and special staff for the purpose would be needed in both urban and rural areas. The type of meal provided must vary according to season and locality and should be considered in consultation with nutrition experts. Ideally the food or meal provided in schools should be such as to make up for quantitative and qualitative defects in the home diet, but almost any supplement which supplies additional calories is of value.

(ix) Industrial workers must be properly fed if they are to be healthy and efficient. An adequate wage related to the cost of food is essential to this end. The development of well-run industrial canteens would benefit both employers and workers. Reference is made to the possibility of creating Government restaurants which would supply cheap and well-balanced meals to urban workers of all kinds and play a part in the educational campaign for improved diet.

(x) A well-developed food industry concerned with food processing in general would provide a steady market for various food products, facilitate the storage and distribution of perishable foods, enable full advantage to be taken of seasonal abundance, and help to fill gaps in the supply of various kinds of foods in areas and seasons in which there is a shortage. The growth of food industry would have the general effect of introducing more efficient methods for the storage, transport and distribution of food. The greater production of shark liver oil and vitamin A preparations from such oil is recommended, as also the manufacture of "food yeast" and synthetic vitamins. It is, however, pointed out that the development of food industry and production of vitamin-rich substances and synthetic vitamins would leave basic problems of nutrition and food supply unsolved, and must be regarded as being of somewhat secondary importance in relation to these problems.

(xi) The control of the quality of foods in the broadest sense of the term is an essential part of a progressive food policy.

PART IV

IMPROVEMENT OF AGRICULTURAL ECONOMY

PART IV

Improvement of Agricultural Economy

CHAPTER I.—LAND TENURE PROBLEMS

A.—Preliminary

In Part III of this report we examined the possibilities of developing agricultural production by the application of scientific knowledge and technical resources. As we have pointed out, the existence of these technical possibilities is not sufficient; they must be realized. Government can and must assist in their realization, but in the last resort, it is the people, the millions engaged in agriculture, who, by their individual and co-operative efforts, must secure the increase in agricultural production on which the welfare of the community so largely depends. Are the producers capable of the effort which is necessary? Have they the necessary resources? Are they suitably organized for co-operative effort? In other words, is agricultural production in the country generally organized so as to be capable of realizing the technical possibilities of increased production? We propose to consider these questions in this part of our report.

2. The organization of agricultural production depends, to a large extent, on the system of rights and obligations of holders of land, that is, on the prevailing land systems. The view has often been expressed that there is a close connection between many features of the present land systems and the efficiency of agricultural production, and that the latter cannot be materially improved unless changes are made in the former. We, therefore, put the following questions to the Provincial Governments:—

(i) Describe the various systems of land tenure prevalent in your province. State the extent of land held under each of these systems.

(ii) To what extent was there a tendency for ownership of land to pass out of the hands of cultivating classes to non-cultivating classes? Has this tendency been arrested or reversed to any significant extent?

(iii) Is absentee ownership of land increasing? If so, do you consider it to be a factor restricting the growth of agricultural production? Have any remedies been tried and with what results? Can you suggest any remedies?

(iv) Are the cultivating classes rack-rented in any areas of your province? Have any remedies been tried? If so, with what results? Can you suggest any remedies?

(v) (*a*) Is there a tendency to progressive reduction in the average size of holdings, and/or their fragmentation?

(*b*) Have any measures been adopted to restrict sub-division of holdings, if so, with what results?

(*c*) Have any measures been adopted to promote consolidation of holdings, if so, with what results?

(*d*) What measures would you recommend for securing improvement in these respects?

(vi) The view has been expressed that unless changes are made in the prevalent systems of land tenure, it would not be possible to secure any significant increase in agricultural production or significant improvement of the standard of life of the cultivating classes. Do you agree with this view? If so, discuss in relation to each system of land tenure prevalent in your province, those aspects which, in your opinion, are objectionable as tending (*a*) to prevent extension of cultivation or irrigation or (*b*) to prevent the adoption of improved methods of agriculture or (*c*) to prevent the cultivator from securing a fair return for his labour and enterprise. Outline the changes which you consider necessary and the measures by which such changes can be brought about.

Replies have been received from all Provincial Governments,[1] and we shall discuss the points emerging from these replies in succeeding sections of this chapter.

3. We should observe at the outset that we are under no illusion as to the adequacy of our treatment of these subjects. The questions involved are of a complex character, and they relate to an enormous area, in different parts of which conditions vary widely. Factual information indispensable for a proper study of the problems involved, is incomplete and may, in the diverse conditions prevailing in different parts of the country, easily lead to misleading conclusions. While we have no doubt that Provincial Governments have taken great pains to supply us with such information as could be secured within the relatively short time available—and we are extremely grateful to them for this—it is obvious that the material, which we have collected, can at best be regarded as only the basis for a preliminary study. Nor have we within the time at our disposal been able to undertake anything more than a preliminary survey of the subject. We, therefore, desire to make it clear that the views expressed by us in this chapter should be treated only as the tentative results of a preliminary survey. They are intended only to indicate the scope of some of the problems involved, and the directions in which, we believe, investigation should be directed in order to find appropriate solutions. Our object is to bring out prominently the existence of certain problems which require to be solved, and to recommend that the Provincial Governments concerned should accept, in principle, the need for undertaking an examination of them. Such an examination should be based

[1] Vide Appendix V.

on investigations of local conditions and we recommend that such investigations should be undertaken in all provinces on a comprehensive basis.

B.—Land Systems

4. Land is held in most parts of India under one or other of the three major systems. These are—

(i) the permanently settled estate system, (ii) the temporarily settled estate system and (iii) the ryotwari system. Apart from these three major systems, there are a number of minor systems in different parts of the country. The total area under the latter, however, is only a small proportion of the area under the former. The permanently settled estate system prevails in most parts of the provinces of Bengal and Bihar, about one half of Orissa, about one third of Madras and smaller proportions of the provinces of Assam and the United Provinces. The temporarily settled estate system prevails in the United Provinces, nearly the whole of the Central Provinces (but not Berar), about a fourth of the province of Orissa and in some areas in provinces where the permanently settled estate system prevails. Subject to what has been said about the minor systems, the ryotwari system, generally speaking, prevails in the rest of the country.[1]

5. The features which distinguish the three major systems owe their origin primarily to differences in the character of the settlements of land revenue made in the course of the 18th and 19th centuries. The fact that the revenue was fixed in perpetuity under the permanently settled estate system and is revisable under the other two is a well-known distinguishing feature. The other important difference between the ryotwari system on the one hand and the permanently and temporarily settled estate systems on the other, lies in the unit which was adopted for the purpose of settlement. Under the former the revenue was fixed on individual pieces of land and the actual occupants, who were recognized as possessing a permanent and heritable right of occupancy, became liable for its payment. Under the latter the "estate" was the unit and the holder of the estate (commonly called the proprietor), not the actual occupant of the land, became responsible for the payment of the land revenue. The actual occupants were not, however, all tenants at will. It has always been an accepted principle in India that the occupant of the soil is entitled to remain in possession from generation to generation, provided he pays the customary dues either to the sovereign power or to the person recognized by that power as entitled to receive such payments. At the time of the original settlements, therefore, a large proportion of the occupied lands in the majority of the estates was held by persons who had a permanent and heritable right to occupy and cultivate the land, subject to the payment of the customary rent.

[1] Certain areas which are not usually referred to by name as ryotwari (e.g., Government estates or Khasmahal estates of Bengal and Orissa) are really of this category, since they differ in no essential respect from areas under the ryotwari system.

In the early days of British administration there was a tendency for the occupancy right to become obscured and obliterated. Many legislative measures have, however, been passed during the last 100 years confirming and extending this right of occupancy, with the result that to-day the great majority of tenants holding under proprietors (or sub-proprietors) possess a permanent and heritable right of occupancy in the lands of their tenancies. Home farm lands in which the holder of estate also enjoys the right of occupancy, are the exception and are specifically delimited by law as such.

6. Thus, under the three systems, there is in respect of every individual piece of land, one person whom we propose to call the "occupancy-right-holder." This occupancy-right-holder is generally called a ryot under the ryotwari system, while under the other systems he is sometimes described as a ryot and sometimes as a tenant [1] Fundamentally, their rights are the same; they hold their lands on a permanent and heritable tenure. In general, they also possess unrestricted rights of transfer—though this statement is subject to exceptions, more especially under the temporarily settled estate system.

7. The occupancy-right-holder holding land under the ryotwari system pays land revenue to the Government, while the occupancy-right-holder under the other two systems pays rent to the proprietor of the estate. Both payments are similar in character in the sense that they are not determined on a purely contractual basis. Under the ryotwari system, as well as the temporarily settled estate system, the amount of these payments is fixed at settlements carried out periodically by Government. The payments due on lands held under the permanently settled estate system are less often settled in this manner. The original basis of the level of rents under this system was custom, modified partly by contract in the past and largely by legislation regulating the conditions under which rents may be altered.

8. We have considered it necessary to draw attention to what we regard as an essential common feature of all the three major systems, because it is not unusual to suppose that under the ryotwari system the land is held by a large number of small peasants in their own right, while under the other systems land is held by a relatively small number of large landlords whose lands are cultivated by tenants without any statutory rights. This is not the case. The central figure in all the three systems is the occupancy-right-holder. The proprietors of estates are not occupancy-right-holders in respect of the greater part of the lands in their estates. Thus, in Bihar, the extent of land held by

[1] Discussion of land tenure problems is often complicated by the fact that the same name often means different things and different names often mean the same thing. Thus, the term *zamindar* as commonly used in the Punjab and Sind, refers to persons holding land on a very different tenure from *zamindars* in the permanently settled areas.

proprietors[1] in their cultivating possession is 3·46 million acres, while the extent of lands held by various classes of occupancy-right-holders is 20·36 million acres. Similar figures are not available for Bengal but from certain estimates made by the Bengal Land Revenue Commission, it is possible to infer that the proportion of lands held by proprietors in their cultivating possession is much smaller in that province. In the United Provinces the extent of land described as '*sir*' and '*khud kast*' (representing land held by proprietors in cultivating possession) is 5·96 million acres against 26·92 million acres held by various classes of tenants who are occupancy-right-holders. There are no figures showing the distribution by size of holdings of occupancy-right-holders under the different systems, but there is little reason to suppose that large holdings are more characteristic of one than another.

9. On a review of the replies received from Provincial Governments we find that the problems requiring investigation may be classified under three heads:—

(i) *Size of holdings, subdivision and fragmentation.*—It is well-known that a large proportion of land is held in small holdings. There exists a tendency, directly relatable to the rights of inheritance and the transfer of land, which, through subdivision, causes a progressive diminution in the size of holdings and their fragmentation. The need for legislative and administrative action in relation to this tendency is a matter for examination. This applies to all the different land systems.

(ii) *Occupancy-right-holder and non-occupancy tenant.*—Another class of problems is the tendency for land to be held by occupancy-right-holders who do not attend to its efficient cultivation, and who lease such lands to tenants on terms which inhibit such cultivation. This again, is a matter for examination in respect of all the different land systems.

(iii) *The permanently settled estate system.*—There is a growing body of opinion that, apart from the defects already referred to, which are common to all the systems, there are defects peculiar to the permanently settled estate system which make it desirable that the system should be abolished and the ryotwari system introduced in its place.

In succeeding sections of this chapter we discuss each of these three classes of problems separately.

C.—Size of Holdings—Subdivision and Fragmentation

10. We mean by a "holding" all the lands in which one person has a permanent and heritable right of occupancy. The term "holding", however, is sometimes used in a different sense;

[1] Including proprietary under-tenure-holders.

that is, to signify the land actually cultivated by a person. The two conceptions are obviously different, and we propose to restrict the use of the term " holding " to the former category and to use the term " farm " for the latter. Thus, let us suppose that *A* holds as an occupancy-right-holder five plots of land bearing numbers 1 to 5, and *B* similarly holds two plots of land bearing numbers 6 and 7. Let us further suppose that *A* cultivates the land bearing numbers 1 to 4 and leases number 5 to *B* for cultivation, then the " holding " of *A* consists of plots 1 to 5, while his " farm " consists of plots 1 to 4; and *B*'s " holding " consists of plots 6 to 7, while his " farm " consists of plots 5 to 7.

11. We believe it is broadly correct to say that statistical information about holdings is incomplete and that practically no information is available about farms. In areas under the ryotwari and the temporarily-settled estate systems and in some areas under the permanently-settled estate system, official records are maintained of occupancy-right-holders and the lands included in their holdings. The officially recorded holding, however, is not always the same as the actual holding. The same person may hold lands in what are recorded as separate holdings; and it is equally likely that the recorded holding may include what are in actual fact separate holdings. In the greater part of the area under the permanently-settled estate system, such records are not maintained by official agencies, and accurate information on the subject is not available from the records maintained by the proprietors of the estates. Again, in areas where records are maintained, the information is not, except in a few provinces, compiled and classified. A number of special enquiries, however, have been made from time to time, which afford some indication of the position. We proceed to set out certain figures from which an idea can be formed about the size of holdings in Bengal, the most important province under the permanently-settled estate system; the United Provinces, a province under the temporarily-settled estate system; and Madras, the Punjab and Bombay, three provinces where land is held predominantly under the ryotwari system.

Bengal.

12. At the instance of the Bengal Land Revenue Commission, enquiries were made in typical villages in all districts of the province into the lands held by 19,599 families. The average holding was ascertained to be 4·4 acres, and the distribution was as follows: 3·3 per cent of the families had no raiyati or under-raiyati interest, that is, were not occupancy-right-holders; 42·7 per cent held less than 2 acres; 11·2 per cent between 2 and 3 acres; 9·4 per cent between 3 and 4 acres; 8·0 per cent between 4 and 5 acres; 17·0 per cent between 5 and 10 acres; and 8·4 per cent above 10 acres. The sample may not have been fully representative of the province, but the figures are the best available, and may be assumed to represent conditions in the province fairly accurately. The average yield of cereals per acre of net area sown in the

province is 0·48 ton.[1] From this it may be inferred that the average holding in this province is capable of yielding, under existing conditions, a little more than 2 tons of cereals. It may also be inferred that approximately two-thirds of the total number of holdings are below the average, yielding less than 2 tons; that about one-half of all holdings yield below one ton; that roughly one-fourth of the total number of holdings yield between 2 and 5 tons; while those yielding 5 tons and more are about one-twelfth of the total number. It should be added that while the number of holdings yielding 5 tons or more is relatively small, the extent of the lands included in such holdings is proportionately much larger. We have, however, no information about the actual extent of such lands.

The United Provinces

13. The average size of a holding in the United Provinces varies greatly with the fertility of the soil. In the Gorakhpur division, which is fertile and intensively cultivated, the average area is 4·8 acres, whereas in the Jhansi division, where the soil is unfertile, it is over 12 acres. The average area for the province is 6 acres. The yield per acre of net area sown for the province as a whole is distinctly smaller than in Bengal, being roughly 0·35 ton[1].

This shows that the average holding in the province is capable of yielding a little more than 2 tons of cereals; that is, roughly the same as in Bengal. Classified particulars for the province are not available, but the following figures, relating to two *tehsils* of the Agra district, are of interest. The average size of a holding in this area was, at the time (1931) the figures were collected, somewhat larger than that for the province as a whole. It was found that 27·3 per cent of the holdings were less than 2·5 acres and 23·3 per cent were between 2·5 and 4·5 acres. Thus, nearly one-half of the total number of holdings were capable of yielding about 1·5 tons or less. 28·9 per cent of the holdings were between 5 and 10 acres, 14·3 per cent between 10 and 17·5 acres, and 6·2 per cent over 17·5 acres. Enquiries made by Settlement Officers indicate that, in this province, in spite of the increase in population, the average size of the holding has remained practically the same over a long period of years; but there has been a large

[1] Statement showing the average yield per acre of net area sown in certain provinces.

	Estimated net area of rice, wheat, jowar and bajra (thousand acres).	Yield per acre of net area sown (tons).
Bengal ..	18,407	0·481
Madras ..	15,718	0·412
United Provinces ..	15,566	0·348
Punjab ..	12,348	0·336
Bombay ..	15,421	0·189

The figures represent the average of three years ending 1938–9. As net acreage figures for individual crops are not recorded, they have been estimated on the basis of the relation between 'net area sown' and 'gross area sown' with all crops in each province.

increase in the number of plots per holding with a consequent diminution in the average size of a plot. Joint holdings continue to be a common feature in this province.

Madras

14. The following figures are taken from the Land Revenue Administration Reports of 1936 and 1937. They show the number of single and joint *pattas* and the areas of wet and dry land:—

	Single pattas.	Joint pattas.	Total.
Total number (in millions)	3·72	2·45	6·17
Area of dry (in million acres)	13·17	9·10	22·27
Area wet (in million acres)	3·78	1·50	5·28
Total area ..	16·95	10·60	27·55
Average acreage per patta	4·5	4·4	..

Assuming the average size of a holding to be substantially as recorded for *pattas*, the figure of 4·5 acres is not very different from that for Bengal. The average yield per acre of net area sown is, however, rather smaller. The average yield per acre is 0·41 ton,[1] which means that the average holding is capable of yielding rather less than 2 tons. Seventy-four per cent of the holdings, covering 36 per cent of the total area, have an average area of 2·4 acres; that is, they yield on the average one ton. The classification of *pattas* is on the basis of the assessment, and the Madras Government have stated that while *pattas* paying Rs. 10 and less formed 69·5 per cent of the total number about 20 years ago, they now amount to about 76·5 per cent. The results of enquiries conducted by the University of Madras in selected villages also show that the average size of holdings has decreased.

Punjab

15. The results of an enquiry into the size of holdings in this province, quoted by the Royal Commission on Agriculture, showed that 17·9 per cent were under one acre, 25·5 per cent between 1 and 3 acres; 14·9 per cent between 3 and 5 acres, and 18 per cent between 5 and 10 acres. The Commission remarked that "the area of cultivated land held by each owner is increasing on the whole, although in numerous villages there is a tendency in the opposite direction." The results of an enquiry made in 1939 by the Board of Economic Enquiry, Punjab, have been furnished to us by the Punjab Government.

Size of holding. From	Percentage of owners.	Percentage of land.
0 to 1 acre	20·2	0·8
1 to 3 acres	28·6	5·2
3 to 5 ,, ...	14·9	6·2
5 to 10 ,, ...	16·9	13·1
10 to 15 ,, ...	7·3	9·1
15 to 20 ,, ...	3·6	7·2
20 to 25 ,, ...	2·2	5 6
25 to 50 ,, ...	3·9	14·8
50 acres and over	2·4	38·0
Total ..	100·0	100·0

[1] See footnote on page 255 ante.

The Government have commented on these figures as follows:—

"It will be observed that the owners are congested in the lower groups and the land is concentrated in higher groups. If 50 acres be taken as the maximum size of a holding which a farmer would ordinarily cultivate directly, it will be observed that 38·0 per cent of the land is held by owners possessing more than this area each. On the other hand, if 5 acres be taken as the smallest economic holding 63·7 per cent of the owners would be found to possess uneconomic holdings; whereas the former class feels the necessity to let their land on rent, the latter is anxious to take some more land into their holding to make an economic holding or to work purely as tenants on bigger holdings. Thus the tenant is not necessarily without an owner's holding of his own. In most cases he is owner-cultivator in one field and tenant-cultivator in the adjoining one, or at a little distance."

We are not aware of any precise estimate of the average size of holdings in this province, but the figures given above point to the conclusion that it is probably in the neighbourhood of 10 acres. The average yield per acre of net area sown is roughly 0·34 ton, and thus the average holding in the Punjab is capable of yielding well over 3 tons, a figure substantially in excess of that for Bengal, the United Provinces and Madras. Nearly one-half of the holdings are, however, capable of yielding less than one ton, and they cover about 6 per cent of the total area comprised in all holdings. Approximately one-eighth of the total number of holdings are larger than 15 acres in extent, that is, capable of yielding 5 tons or more. These holdings, we observe, comprise very nearly two-thirds of the total amount of land. A comparison of the figures quoted by the Royal Commission on Agriculture with those furnished to us, indicates that in this province also small holdings are tending to increase in number.

Bombay

16. The following figures[1] relate to the year 1936–37:—

Classification of holdings.	Number in millions.	Percentage of total.	Area in million acres.	Percentage of total.
Up to 5 acres	1·13	49	2·54	9·5
Between 5 and 15 acres ..	0·67	29	6·10	22·8
„ 15 „ 25 „ ..	0·25	11	4·74	17·7
„ 25 „ 100 „ ..	0·22	10	9·23	34·4
Over 100 acres	0·02	1	4·17	15·6
Total ..	2·29	100	26·78	100

On the basis of these figures the average size of a holding is 11·7 acres. While this is larger than the corresponding figure for the provinces previously considered, the yield per acre of net area sown is least in this province, being only 0·19 ton per acre. Thus, the average holding in this province is capable of yielding approximately 2·2 tons per acre, which is about the same as in Bengal

[1] Based on figures given in the table at page 45 of "The Indian Rural Problem."

and the United Provinces. Roughly one-half of the holdings, comprising about one-tenth of all the land, are very small and capable of yielding less than one ton each; whereas holdings capable of yielding over 5 tons number about one-tenth of the total but comprise about one-half of the land.

Subdivision of holdings

17. Thus, under all the land systems, small holdings are the rule, large holdings being relatively few in number, and the general tendency is for the number of small holdings to increase. The replies received from all Provincial Governments indicate that this is so.[1] (An exception is Sind, where large holdings appear to be more common, and where the pressure of population on the land is not yet felt owing to the large increase, during recent years, in the irrigated area.) The immediate cause of the tendency to progressive diminution in the size of holdings is "subdivision" by which is meant "the distribution of the land of a common ancestor amongst his successors-in-interest, usually in accordance with the laws of inheritance, but sometimes effected by voluntary transfers amongst the living by sale, gift, or otherwise. Thus, a man holding 12 acres and having four sons may be succeeded by the four sons, each holding three acres; if three of these sons leave two sons apiece and the other dies childless, the next generation may show six grandsons each holding two acres. But if the childless-holder had sold his land, for instance, to a money-lender, there would be six grandsons with one and a half acres each, and a money-lender with three acres. There are other causes contributing to the process, but subdivision includes the general result of an increase in the number of holders within a family or community."[2]

18. It is generally agreed that it is desirable that this tendency to a progressive diminution in the size of holdings should be arrested. The primary cause of subdivision is the pressure of population on land and the basic measures for checking subdivision are first, the bringing of additional land under cultivation and secondly, an increase in industrial employment. In other parts of our report we have stressed the need for bringing new land under cultivation, and have pointed out that the growth of industry is essential if some of the more pressing problems of village economy, such as excessive pressure of population on land, are to be solved. We do not propose to deal with these matters again in this chapter. What we are concerned with here is whether there is any other measure which it is desirable to adopt for the prevention of subdivision. The Royal Commission on Agriculture who examined this subject at considerable length, observed that "no practical suggestion was put forward for the prevention of further subdivision without interfering with the laws of inheritance." The Commission also examined a proposal put forward by Mr. Keatinge

[1] Part B of Appendix II.

[2] Report of the Royal Commission on Agriculture in India (1928), page 129.

for the formation and maintenance of impartible economic holdings and reached the conclusion that the proposal was open to objections. In view of the importance of this question of impartible holdings, we have further considered it.

19. One of us (Sir Manilal B. Nanavati) holds that the formation and maintenance of impartible holdings is necessary, and that the laws of inheritance should be suitably modified. His views are set out below:—

"The continuing increase in the number of uneconomic holdings is a serious evil. It is not only a question of the unsatisfactory economic position of the owners of such holdings who are compelled to eke out an uncertain livelihood by cultivating land as crop-sharing tenants, by working as day labourers, by driving carts, etc. Uneconomic holdings also constitute a serious obstacle to efforts to increase the productivity of the land. The cultivator who lives on the margin of subsistence, cannot be expected to possess the resources necessary for increasing the outturn of his crops by the adoption of improved farming practices requiring capital. From this point of view it is desirable to take steps to prevent a further increase in the number of uneconomic holdings. It is true that the provision of employment alternative to the cultivation of land by the development of industries will provide a solution to the problem, but this does not remove the necessity of undertaking other remedial measures while industries are being developed. I think it is essential that the medium holding should be defined[1] within certain broad limits and that legislation should be undertaken for the purpose of securing that the right to such a holding passes to a single heir, the excluded heirs being allowed a right to maintenance. I have no objection to holdings which are larger than a medium holding being subdivided under the present laws of succession, provided the subdivision does not result in the creation of holdings smaller in size than the medium holding. Even in respect of holdings which are smaller than a medium holding, I would extend the scope of impartibility to them. If the holdings are not unduly small and are capable of being improved so as to be adequate for supporting a family, I would provide facilities for registering them as impartible, if the holder so desires. I agree that public opinion is likely to be opposed to my proposal, on account of the adverse effect of such a change on the younger sons. It should, however, be possible to educate public opinion to appreciate the necessity for such a proposal in the permanent interests of the country. The proposal is not put forward as an alternative to a programme of industrial development which I consider essential. The proposal is, in fact, complementary to such a programme. It is comple-

[1] A medium holding may be fixed on the basis of a "bullock-power unit". What a bullock-power unit is in terms of acreage of different classes of land in different districts of a province can be settled, on the basis of local enquiries by Provincial Governments. A medium holding may be defined as being not less than one unit nor more than two units. Alternatively, a medium holding may be regarded as one which is capable normally of yielding in terms of cereals not less than two tons nor more than five tons.

mentary because it would compel the junior members of the families owning medium holdings to seek non-agricultural employment at a time when the resources of the family are still adequate for giving them the necessary training as well as the means of support while they are seeking employment. It would prevent the present tendency to accept a gradual decline in living standards as inevitable, and help to arrest the drift towards indebtedness and ultimate insolvency which occurs when the family is outgrowing the land. If public opinion cannot be reconciled to a change in the law of succession such as I have proposed, I would at least urge the abolition of the right of partition of the medium holding, while retaining the existing right of heirs to ownership of fractional shares in the joint holding; and I would also abolish the right of transfer of separate parts of the holding. Even such a limited change would not be without value and should be tried."

20. Two of us (Mr. Ramamurty and Mr. M. Afzal Husain) are unable to accept the fundamental basis of the contention of Sir Manilal Nanavati that the medium holding is necessarily a more efficient unit of production than the small holding. They do not themselves believe, and they are not aware of any evidence in support of the assumption, that a small holder cultivating two or three acres who subsists partly on the income from his holding and partly on earnings from other work, produces less per acre than a medium holder cultivating, say, between 5 and 10 acres. In this view, they see no justification for reconstituting a considerable part of the land of the country into impartible holdings. They would stress the possession of land, however small, as an important element of social security, and they prefer an increase in small holdings to an increase in landless labourers. They are, also, satisfied that public opinion would not tolerate a proposal for the disinheritance of younger sons. In their opinion the uneconomic holding is only an aspect of the problem of poverty as a whole, for which the economic development of the country in all its aspects is the only answer. If this development were achieved, the uneconomic holding would cease to be a problem. They are, therefore, opposed to any alteration of the laws of succession as well as to any attempt to constitute impartible holdings.

21. The other two members (Sir John Woodhead and Dr. Aykroyd) agree with Sir Manilal Nanavati that, from the point of view of productive efficiency, medium and large holdings are preferable to small holdings. But they appreciate the weight of the consideration regarding social security mentioned by Messrs. Ramamurty and Afzal Husain and do not feel justified in recommending a change in the laws of succession which, it is agreed, would be most strongly opposed by public opinion. Again, from the point of view of productive efficiency they see little advantage in a measure which limits the right of partition by prescribing the minimum size of a holding and yet maintains the rights of the heirs to fractional shares. The maintenance of a holding as one legal entity would not prevent the heirs from dividing the land

for the purpose of cultivation. Further, they consider it quite impracticable to attempt by legislation to compel the owners of fractional shares to cultivate the land of the holding jointly.

22. In the result, therefore, our view, as a commission, is the same as that of the Royal Commission on Agriculture. We do not recommend a change in the laws of inheritance. Sir Manilal Nanavati dissents and adheres to the views set out in paragraph 19 above.

Fragmentation of holdings

23. We now turn to the problem of fragmentation. "Fragmentation is quite different from subdivision and refers to the manner in which the land held by an individual (or undivided family) is scattered throughout the village in plots separated by land in the possession of others. If all the fields held by an individual are contiguous so that he can pass from the one to the other without traversing any land but his own, his holding is said to be compact; and if this feature has been brought about by design, it is said to be consolidated."[1] While the progressive diminution in the average size of holdings and the multiplication of small holdings is the direct result of subdivision, fragmentation is caused not so much by the act of subdivision as by the manner in which it is effected. "Thus, if a father with three isolated fields of one acre each, dies leaving three sons, the latter will take not one field each but one-third of each field each . . . In the result, successive generations, descending from a common ancestor, inherit not only smaller and smaller shares of his land but inherit that land broken up into smaller and smaller plots . . . Fragmentation is accentuated by the expansion of cultivation irregularly over the waste, by purchases and sales, and by the extinction of families in default of direct heirs and the division of their property amongst a large number of distant relatives. It has been also the result of the break up of the joint family system and its custom of cultivation is common."[2] There are, however, circumstances in which it would, on balance be an advantage that a holding should not consist of one compact unit. This occurs where, on account of marked variations in the quality of the soil, the holder is able to produce, on a moderately fragmented holding, a greater variety of crops and to find occupation for more days in the year than he could on a compact homogeneous block. Such an argument, as the Royal Commission pointed out, can only hold where the number of blocks does not exceed the number of distinct varieties of soil, and in general fragmentation beyond this point is a serious evil. From the replies received from Provincial Governments we notice that there is little difference of opinion on this issue. The evils of fragmentation are that it involves waste of time, money and effort; that it restrains the cultivator from attempting improvements; that it enforces a uniformity of crop, and especially restricts the growing of fodder crops in the period when cattle are usually sent out to graze in

[1] The Report of the Royal Commission on Agriculture, page 129.

[2] *Ibid*, page 134.

the fields. The remedy for fragmentation is consolidation which is " in reality the substitution—by exchange of land—of a compact block for a number of separate fragments. By this process, all the land of one holder may be formed into one plot only, or into a few plots of different kinds of soil." The Punjab has been a pioneer in undertaking this important reform. Initially, consolidation of holdings was effected in this province on a voluntary basis through a special type of co-operative society. At the end of July 1943, these societies numbered 1,807 and the area consolidated amounted to 1·45 million acres. In 1936, a Consolidation of Holdings Act was passed which provides a certain measure of compulsion. Consolidation operations undertaken under this Act have been carried out in 376 villages and 0·31 million acres have been consolidated. The work is now in progress in 86 villages. The operations, however, take time as, even under the Act, it is necessary to secure the consent of two-thirds of the landholders before effecting consolidation compulsorily. Inadequacy of trained staff has been another difficulty; it is hoped that this will diminish after the war.

24. Statutory provision for consolidation also exists in the Central Provinces and operations have been completed in 2,476 villages in the Chattisgarh division. In the United Provinces consolidation was encouraged, for a number of years, through the co-operative movement but progress was very slow. Work is now proceeding under the Consolidation of Holdings Act which was passed in 1939 and brought into force in 1940. Difficulty has, however, been experienced owing to the dearth of trained officers and staff.

In Madras, an attempt was made in 1936 to consolidate holdings through the co-operative movement and 26 societies were organized for the purpose. The attempt failed, only 1,599 acres being consolidated, and the experiment was abandoned. Special legislation was not enacted and this is said to have been one of the causes of failure. One of the reasons which weighed with the Government of Madras in abandoning the experiment, was that " so long as subdivision has to go on, any attempt at consolidation of holdings was bound to fail." We think the importance of this consideration has been over-estimated. The occasion for subdividing a holding arises only at relatively long intervals, and the benefit of consolidation, once effected, is likely to be experienced for a considerable time. Further, as the Royal Commission on Agriculture observed, the progress of consolidation operations will have some educative effect and promote the habit of carrying out partitions with the minimum of fragmentation.

25. We note that, though very little has been done to remedy the evil of fragmentation in provinces other than those we have mentioned, there is general agreement in many provinces in favour of undertaking remedial measures. In Bombay, a Bill is under preparation to provide for the consolidation of holdings, and in Bihar, where under the permanently-settled estate system

consolidation presents special difficulties, the question is under consideration by the Post-war Agricultural Reconstruction Committee. We recommend that the consolidation of holdings on the lines followed with considerable success in the Punjab and the Central Provinces, should be undertaken in all Provinces. Within each Province areas where fragmentation is a serious problem, should be located by special enquiry and taken up first for consolidation operations. We also recommend, in order to facilitate these operations, that stamp duties and registration charges should be remitted and fees for encumbrance certificates waived.

26. One of the contributory causes of fragmentation, apart from the manner in which partitions are effected, is the existence of unrestricted rights of transfer. The Royal Commission noted that, where restrictions were imposed on the alienation of land, the process of subdivision has been checked to some extent. In the replies received from certain Provincial Governments, reference has been made to pre-emption as a means of preventing fragmentation. The suggestion has been thus described: "It should be made obligatory on a person wishing to sell his share in a holding to offer the same to one or more of his co-sharers, and if none of them was willing to purchase the same, to the holder of one of the adjoining lands. In order to prevent the vendor from taking the plea that no one among his co-sharers or neighbouring tenants is prepared to offer a reasonable price, provision may be made to enable the co-sharer or the adjacent tenant, willing to buy the land, to move a court of law to fix the value of land which the vendor must accept." We commend the proposal for consideration by Provincial Governments, but would add that, in place of the "Court of law," some simple arbitral machinery would be more desirable.

Statistics

27. Finally, we would draw attention to the defects in the statistical information as regards holdings and farms. Measures for increasing productivity must be based on full and accurate information as to how land is held and how it is cultivated. This means that for every village there should be a record of all holdings and farms, including farms held by cultivators who do not possess a right of occupancy in land. Further, the record should distinguish first, between holdings held by agriculturists and non-agriculturists and secondly, between lands held on cash and produce rents. Again, a basis of classification should be adopted for distinguishing between small, medium and large holdings and farms. Information about mortgages is also important and we suggest that the village records should contain particulars of these transactions. There should also be a system of returns, based upon the primary registers, which would enable statistics to be compiled and published in regard to (*a*) the numbers of and the extent of land in the different classes of holdings and farms, (*b*) the number of holdings and the extent of the land held by agriculturists and non-agriculturists respectively, (*c*) the extent of land cultivated

under the crop-sharing system, and (*d*) mortgages. The figures should as far as possible, be compiled on a uniform system in all the provinces. It is further desirable that the primary registers should contain particulars of the number of cattle and farm implements possessed by cultivators. In spite of the difficulties involved we attach great importance (here as elsewhere in the report) to the improvement of statistics. We accordingly recommend that the existing system of records and registers maintained by village officers and subordinate revenue officers, as well as the system of returns based on them, should be reviewed. The existing system should be revised in such a manner as to enable the publication of a statistical abstract by each province, showing the particulars we have mentioned along with other statistics included in those publications.

Summary of conclusions and recommendations

28. Our main conclusions and recommendations are as below:—

(i) Measures for increasing the productivity of the land must be based on full and accurate information as to how land is held and how it is cultivated. At present, the statistical information available about "holdings" (the land in which a person has a permanent and heritable right of occupancy) is generally incomplete and practically no information is available about "farms" (the land actually cultivated by one person).

(ii) It is recommended that the existing system of records and returns should be reviewed and revised in such a manner as would enable the publication of a statistical abstract by every Province giving particulars, such as the numbers, extent, etc., in respect of different classes of holdings and farms.

(iii) Under all the land systems in the country small holdings are the rule and medium and large holdings are relatively few in number; the number of small holdings is increasing. The immediate cause of the progressive diminution in the size of holdings is subdivision.

(iv) Apart from measures designed to bring more land under cultivation and to increase industrial employment, no practical suggestion has been put forward for the prevention of subdivision without interfering with the laws of inheritance. A change in the laws of inheritance is not recommended. One Member (Sir Manilal Nanavati), however, takes the view that a change in the laws of inheritance is necessary. He is of opinion that if public opinion cannot be reconciled to such a change, the right of partition should be limited by prescribing the minimum size of a holding. The other members are not in favour of the latter proposal.

(v) The manner in which subdivision is effected leads to a progressive increase in the fragmentation of holdings. The remedy for the evil of fragmentation is the consolidation of holdings on the lines undertaken with success in the Punjab and the Central Provinces. It is recommended that consolidation should be actively undertaken in other Provinces.

(vi) The areas in each Province where fragmentation is a serious problem should be located by a special enquiry, and taken up first for consolidation operations. In order to facilitate such operations, stamp duties and registration charges should be remitted and fees for encumbrance certificates waived.

(vii) Some limitation on the existing rights of unrestricted transfer is necessary and desirable in order to prevent increase in fragmentation. The possibility of introducing a system of pre-emption which would secure this result is suggested for consideration by Provincial Governments.

D.—The Occupancy-Right-holder and the Non-occupancy Tenant.

29. In this section we shall consider the second of the three classes of problems to which we referred at the end of section B, namely, "the tendency for land to be held by occupancy right-holders who do not attend to its efficient cultivation, and who lease such lands to tenants on terms which are believed to inhibit efficient cultivation by such tenants." Does this tendency exist? Is inefficient cultivation common? To what extent do occupancy right-holders cultivate their lands themselves with or without the aid of hired labour, and to what extent is their land cultivated by tenants without permanent rights? What are the terms on which land is let by the occupancy right-holder? What type of lease is conductive to efficient cultivation, and what type is not? These are important questions. We shall briefly review the facts and opinions which have been furnished in reply to our questions. We may say at the outset that, so far as the relative efficiency of cultivation under different systems of farm management is concerned, very little factual information is available. Some statistics are available about the proportion of land held by non-occupancy tenants, that is, tenants-at-will, in different parts of the country, but even this is far from complete or accurate.

Sind

30. As far as we can ascertain, large holdings are more common in Sind than in other provinces and only about one-fifth of the land is held by small holders. Roughly four-fifths of the cultivated land are held by "zamindars" and the predominant method of cultivation is the *batai* or "crop sharing" system. Under this system, the cultivator (*hari*) provides his own labour and that of his bullocks in return for half the crop. The system is believed to "get as much out of the land as the quantity and quality of the labour available permits, and shields the cultivating classes from many evils." The Government of Sind have expressed the view that "rack-renting is not a possibility in Sind under the crop-sharing system owing to the shortage of agricultural labour." It is only in cases where the zamindar leases his land to a lessee who cultivates the land through others on the crop-sharing system,

that there is a tendency for cultivation to suffer. The reason for this is that the period of the lease is short, and the lessee, therefore, has little incentive to keep the land in good condition. The extent of such land, however, is less than 8 per cent of the total.

The Punjab

31. The cultivated area in the province for the quinquennium ending 15th June 1942 was 31·17 million acres, of which 15·25 million acres—that is, nearly one-half—were cultivated by tenants-at-will. All these tenants-at-will are, however, not without lands of their own; the majority are owner-cultivators in one field and tenant-cultivators in the adjoining or nearby one. "The great majority of them pay rent in kind (*batai*) and this generally amounts to half the produce. On land irrigated from wells, it is generally one-third of the produce and it may be less; but the usual practice is to pay half the crop. The tenant-at-will has to bear the expenses of cultivation and provide the plough and cattle, but his landlord sometimes provides half of the seed." The Punjab Government have mentioned the following defects of this system: "The landlord has not taken to mechanical farming and still looks to Government for a lead. His net profits from cultivation through tenants are comparatively higher and he, therefore, tends to feel satisfied and to show insufficient interest in extension of cultivation or in improvement of land or its method of farming. . . The tenants are sometimes rack-rented, poor and insecure and consequently have neither the means nor the necessary incentive to effect improvements."

Bengal.

32. Enquiries made at the instance of the Land Revenue Commission showed that, in this province, approximately one-fifth of the land is cultivated through *bargadars* on a crop-sharing system, the occupancy-right-holder and the *bargadar* each taking one-half of the produce. There is also another category of tenants known as "*under-raiyats*" who hold rather less than one-eleventh of the cultivated lands and who unlike the *bargadars*, are protected by tenancy legislation and possess security of tenure. In many cases under-raiyats are the actual occupancy-right-holders and the raiyats who lease their lands to them are little more than rent-receiving intermediaries. The Land Revenue Commission considered the merits of the *barga* system and by a majority recommended that *bargadars* should also be recognized as protected tenants with security of tenure, and that the rent should be limited to one-third of the gross produce. The majority, while agreeing that the system had "many advantages," stressed its disadvantages in the following terms: "The *barga* system overrides the principle that the tiller of the soil should have security and protection from rack-renting. No one denies that half the produce is an excessive rent. Further, the balance of opinion in all countries is that this system of cultivation is not economic and, therefore, not in the interests of the community as a whole. The cultivator only gets the benefit of half the value of any increase in yield

which is the reward of his own labour or enterprise. If the crop is even a partial failure, he does not earn the cost of cultivation." A minority of the Commission held a different view. They pointed out that the system is in vogue in France, Italy, America, Australia, and other countries and added that " In a country of small holdings cultivated by an army of indigent raiyats depending on private money-lenders and rainfall, the *barga* system is not only inevitable but also wholesome. Moreover, the system is as old as the country itself and should not be abolished." On the question of security of tenure, the minority held that " in a share-tenancy mutual trust is the core of the system, and although *bargadars* have no written leases, they are little disturbed. A written lease which will be the ' material for lawyers ' tends to impair the trust on which the system is based." The minority also criticized the proposal to limit the rent to one-third of the gross produce, and pointed out that this was also the maximum in the case of under-raiyats, " with whom the higher-grade raiyat has little connexion except the receipt of rent. In a share-tenancy, the supervision and constant vigilance of the landlords on the *bargadars* is essential, but under the recommendation they will be entitled to no better remuneration for the services rendered and the uncertainties and risks inherent in share-produce faced."

The United Provinces and the Central Provinces.

33. The following table shows the land held in the United Provinces by proprietors in cultivating possession (*sir* and *khudkasht*) and that held by various classes of tenants:—

	Million acres.
A. *Sir* and *Khudkasht*	5·26
B. (i) Hereditary tenants	14·99
(ii) Occupancy tenants	10·11
(iii) Ex-proprietary tenants and holders of special tenures in Oudh	0·81
(iv) Fixed rate tenants and permanent tenure holders	0·71
C. Non-occupancy tenants	0·19
	33·07

All tenants, except non-occupancy tenants, have hereditary rights. The fixed rate tenants and the permanent tenure holders (category B, class IV), possess the right of transfer but the holdings of all other tenants are non-transferable. In reply to our questionnaire the Provincial Government have informed us that throughout the major part of the province the rents payable by the tenants have been " modified to a fair pitch " as the result of settlement operations, and tenancy legislation provides a fairly effective control against the rack-renting of tenants.

In addition to tenants, there are sub-tenants who hold from year to year and are tenants-at-will. These sub-tenants usually pay a rent approximating to half the produce. We have no information about the area of the land cultivated by sub-tenants but it is probably not very large, for there are restrictions on sub-letting and the penalty for illegal sub-letting is ejection.

Under the Tenancy Act of 1939, ex-proprietary occupancy and hereditary tenants in Agra are allowed to sub-let again after the expiry of three years. The same provisions apply in Oudh with the exception of tenants holding under special tenures and occupancy tenants. Non-occupancy tenants may sub-let for one year only and may sub-let again only after an interval of one year. The Government of the United Provinces have informed us that the number of tenants ejected for giving sub-leases in contravention of the provisions of the Act has been considerable.

Figures are not available for the Central Provinces but the position as regards rack-renting appears to be the same as in the United Provinces. The Provincial Government observe. "Rack-renting is not a substantial menace. The tenancy laws provide safeguards against it."

Bihar

34. Certain figures collected from survey and settlement reports indicate that in Bihar the extent of land held by non-occupancy ryots and under-ryots is 0·66 million acres as against a total of 24·48 million acres; 20·36 million acres are held by different classes of ryots with a permanent and heritable right of occupancy and 3·46 million acres by proprietors and tenure-holders in cultivating possession. Some of the survey and settlement reports were written many years ago. The figures therefore do not accurately represent the present position, but they give an idea of the relatively small proportion of land held by persons without occupancy rights.

The non-occupancy tenants, as well as a small section of occupancy ryots, pay various kinds of produce-rents. Under the *batai* system the tenant's share varies from one-half to one-third of the crop and the landlord's share from one-half to two-thirds. Other forms of produce-rent are grain-rents assessed at a fixed rate per local unit of area, or at a fixed quantity for the whole of the holding. As a result of recent legislation, the produce-rent payable by occupancy-right-holders has been limited to 9/20ths of the produce. This, however, does not affect non-occupancy ryots and under-ryots. The Bihar Government observe: "There is practically no rack-renting in this province. Certain classes of tenants who hold *bakasht* lands or are under-ryots of big cultivators are the only class who can be said to be rack-rented. But in consequence of recent amendments in tenancy legislation resulting in considerable reductions in rents, rack-renting has been very much controlled."

Orissa

35. No figures are available which distinguish the extent of the land held by occupancy-right-holders from that held by non-occupancy tenants. Cash rents are a common feature in this province but we are told that " a considerable area is held on produce-rent which is generally of two kinds. The commonest form is known as *dhulibag*, which implies equal division of the by-products as

well as grain. The second form is that known as *Sanja* (contract) under which a fixed quantity of produce is paid. Payment of half the produce or its commuted value practically leaves to the cultivator less than his bare subsistence requirements." The Government of Orissa suggest that a suitable remedy would be to amend the tenancy laws and limit the rent legally leviable to one-third of the gross produce.

Madras and Bombay

36. In Madras "there are two important types of tenancy, under the occupancy-right-holder, namely, the *varam* and the *kuthagai*." Under the former the tenant pays as rent a share of the crop, whereas under the latter he pays a fixed sum in cash or a fixed amount of produce. Variations occur under both systems depending on the nature of the land, the irrigation facilities, seed, manure, and plough cattle provided by the landlord or tenant respectively and the kind of crop raised. There is no information showing the extent of land cultivated by tenants without occupancy rights. As regards the incidence of the rent payable by them, the Madras Government observe: "It cannot be said whether the cultivating classes are rack-rented generally in any area in the province, as sufficient information is not available. There is nothing to prevent the tenant of a ryotwari ryot or of an occupancy ryot or of an *inamdar*, possessing both *varams* in the land, being rack-rented. More research into tenancy conditions is necessary."

The position is similar in Bombay, and the Bombay Government have commented as follows: "The tenant who cultivates land on lease, which is generally annual, is not sure how long the lands would remain in his possession as the landlord has power to resume the lands at the end of the year after giving three months' notice to the tenant. The tenant has thus no permanent interest in lands. In many cases, lands are leased on the crop-sharing rent, and if the tenant sows improved seed or puts in good manure or extra labour to improve the land, half of the increased produce so obtained at his cost goes to the landlord, and thus the tenant does not get a proper return on his labour and enterprise. The absentee landlord cares only for his annual rent and takes no interest in the improvement of his land or the introduction of improved methods of cultivation. With a view to give some stability to the existing tenants and to encourage them to take interest in the lands leased to them, the Tenancy Act was passed in 1941. Under this Act, the landlord cannot resume lands from the existing tenant at least for a period of ten years and cannot increase his rent, except for improvements carried out at the landlord's expense. The Act has been applied to selected areas to begin with and it is proposed to extend it to other areas in course of time."

The North-West Frontier Province and Assam

37. The Government of the North-West Frontier Province have observed that "rack-renting is an unknown feature in this province since tenants receive a share of the crop from the threshing floor, varying from one-third to two-thirds of the produce

according to the local conditions." The Assam Government observe that "There is rack-renting in the zamindari areas," but have not furnished other details.

Factors tending to inefficient cultivation

38. It is evident from the foregoing review that the proportion of the land cultivated by non-occupancy tenants varies very considerably in different parts of the country. It is relatively large under the ryotwari land system, and particularly so in the Punjab and Sind; it is probably somewhat smaller, but still considerable, in the areas under the permanently-settled estate system and is relatively small under the temporarily-settled estate system. The terms on which land is held by this class of tenants vary, but it is noticeable that the crop-sharing system generally predominates and exists in all provinces. Doubts and differences of opinion exist as to the effects of this system on the efficiency of agricultural production. It seems to us *prima facie* probable that production must suffer where the tenure of the cultivator is insecure, and the incidence of the rent so heavy as to leave the cultivator an inadequate return for his labour and enterprise. At the same time, it has been urged that, in many areas where the crop-sharing system prevails, the tenure is more secure in practice than in theory. Again, there is a striking difference of opinion as to what constitutes an excessive rent. While the majority of the Land Revenue Commission in Bengal say that "no one denies that half the produce is an excessive rent," the Government of Sind have said, in respect of the same system in their province, that "rack-renting is not a possibility owing to the shortage of agricultural labour." In the North-West Frontier Province, rack-renting is said to be an unknown feature, though a produce-rent at the rate of two-thirds of the produce prevails in some cases. It is obvious that a share of the produce, say half, may give the cultivator a fair return for his labour and enterprise where the productivity of the land is high but may not where it is low. Again, the adequacy of the return to the cultivator must inevitably depend on whether he is able to secure a sufficiently large area for cultivation, and this is more likely to be the case in some parts of the country than in others, depending on the pressure of population on the soil.

Further, a *prima facie* defective system of leasing may yet be consistent with a high degree of efficiency of production where the occupancy-right-holder takes an interest in the cultivation of the land, exercises close supervision over his tenant and assists him with plough, cattle, manure, etc. This may and does not always happen, as, for example, where the occupancy-right-holder is an absentee not effectively represented on the land, is not himself a professional agriculturist or for some other reason takes no interest in the cultivation of the land.

39. The replies we have received to our enquiry about the prevalence of absenteeism indicate that the evil exists, is increasing in some parts of the country, and that the extent to which it

prevails varies. It is generally agreed that where it exists it is an important factor tending to restrict production, since neither the absentee landlord nor the short-term tenant is interested in investing capital on the improvement of the land, or the adoption of intensive methods of cultivation.

The tendency for land to pass out of the hands of the cultivating classes into the hands of non-agriculturists was a well-marked feature in many parts of the country during the 'thirties' of this century. There are indications, however, that the process has been checked and that, at present, transfers of land from the small holder to agriculturists with larger holdings are, generally speaking, more common than transfers to non-agriculturists.

40. The broad conclusion to which we are led by our preliminary survey of this subject, may be stated as follows. The terms on which land is let by occupancy-right-holders to non-occupancy tenants are a material factor in determining the efficiency of agricultural production. It is desirable that the terms of tenancy should be such that either the occupancy-right-holder provides the facilities necessary for efficient cultivation or the non-occupancy tenant holds on conditions as to duration of tenancy and rent which provide an adequate incentive for efficient cultivation. Tenancy conditions which are conducive to efficiency of production vary in different tracts. Whether or not the conditions prevailing in any tract are a handicap to an increase in production should, in our opinion, be carefully investigated. We, accordingly, recommend such investigation.

The crop-sharing system

41. One of us (Sir Manilal Nanavati) feels convinced that the crop-sharing system is incompatible with efficiency of production and considers that steps should be taken to abolish it. He suggests that, where large holdings are cultivated on this system, they should be acquired by the State and resold on reasonable terms to cultivators who either have no land of their own, or whose holdings are too small to support them and their families. The new holdings should, as far as possible, be economic holdings, and inalienable except with the permission of Government Alternatively, he suggests that tenancy legislation should be undertaken for the purpose of fixing cash rents for lands held on the crop-sharing system and conferring occupancy rights on the tenants. We have carefully considered these proposals, and are of the opinion that they are open to objections.

42. We have drawn attention already to the difference of opinion and the doubt which exist about the merits of the crop-sharing system. It is, however, undeniable that the system is "as old as the country" and prevails in all provinces and more especially in those areas where pressure of population on the land is not acute. In these circumstances, we are unable to agree that the system is intrinsically unsound in all circumstances. We have, however, already indicated that in certain areas and under

certain circumstances, the system may be responsible for inefficiency of cultivation. In such cases, it is clearly necessary that suitable remedies should be found. This is why we have recommended that a detailed investigation of the subject should be undertaken.

43. The suggestion that large holdings should be acquired by the State and re-sold on reasonable terms to landless cultivators or small holders is unacceptable to us for the following reasons. First, we are not convinced that the change will necessarily tend to an increase in agricultural efficiency. A policy directed to inducing or compelling large holders to apply their resources to the more efficient cultivation of land, is likely to yield better and quicker dividends in the shape of increased efficiency than the multiplication of small holdings. Secondly, the proposal is likely to prove unworkable in practice if fair compensation is paid for the lands acquired and the cost of acquisition is recovered in full from small holders. A large amount of capital outlay and a considerable amount of subsidization would in practice be found necessary. These would be far better devoted to the provision of facilities necessary for improving the productivity of the land than to any scheme of redistribution of land.

We are also not satisfied as regards the advantages of the alternative suggestion, namely, that cash rents should be fixed by law and occupancy rights conferred on the tenants. This would involve the conversion of the present owners into a new type of statutory rent-receivers at a time when the existence of rent-receiving intermediaries between the occupancy-right-holders and the Government is urged as a justification for the abolition of the permanently-settled estate system. If cash rents are fixed so as to approximate to an economic rent, the tenant is likely to be no better off, and may, in fact, be worse off, as a result of the change. If, on the other hand, cash rents are fixed below the economic rent, it is probable that the land would not be let except on the payment of a premium. Again with cash rents below the economic rent there would be scope for subinfeudation and steps would have to be taken to prevent sub-letting by the tenant newly inseted with the occupancy right. The course proposed seems, therefore, likely to create more problems than it solves.

44. We incline to the view that the settlement of tenancy conditions, fair and equitable to both landlord and tenant, must be a flexible process capable of adaptation to varying circumstances. It has been suggested that a solution of this problem must be sought in the same way in which improvement of labour conditions has been secured in industry, that is, by developing the principle of collective bargaining supplemented by arbitration. We commend this suggestion for consideration. In a subsequent chapter we shall explain why, from many points of view, it is desirable that cultivators of small farms should be organized in multi-purpose co-operative societies. If these societies are formed, they would, in addition to helping the farmer in other ways, also

help to promote collective bargaining between large landholders and their tenants and establish healthy tenancy conditions. Another way in which tenants could be organized would be by the formation of co-operative rent societies. Such societies would take on lease land from large landholders and let it out to their members. Co-operative societies have been tried for this purpose in Europe.

Associations of large landholders (occupancy-right-holders.)

45. While we have given our reasons against a drastic interference with the existing rights of large holders of land, we desire to make it clear that neglect of the land or inefficiency of cultivation should not be tolerated. Throughout this report we have emphasized the importance of securing a substantial increase in the output of land already under cultivation. On this depends the welfare of the growing population of the country. It is therefore, clearly the duty of all occupancy-right-holders to manage the lands held by them to the best advantage and improve their productivity. This is particularly the case as regards the larger landholder who naturally possesses more resources than the small holder. We recommend that public opinion should be educated on this point, and we would particularly urge that large landholders as a class should realize their duty and group themselves in organizations with the aim among others, of securing the discharge of this duty by individual members. In some parts of the country, agricultural associations have been formed by leading landholders. We believe that such associations would perform a valuable function if they undertook a critical review of the methods of cultivation practised by their members, and took steps to encourage the general attainment of the standard of efficiency reached by the best among them, so that a spirit of healthy competition may be promoted, a sense of pride in making the best use of the land generated, and the general standard of cultivation progressively increased. We recommend that the methods by which the formation of such agricultural associations might be promoted, and their activities stimulated and assisted by local officials, should be studied.

Summary of conclusions and recommendations

46. (i) The terms on which land is let by occupancy right-holders to non-occupancy tenants are material factors in determining the efficiency of agricultural production.

(ii) It is desirable, in principle, that the terms of tenancy should be such that either the occupancy-right-holder provides the facilities necessary for efficient cultivation, or the non-occupancy tenant holds on conditions as to duration of tenancy and rent which provide adequate incentive for efficient cultivation.

(iii) Whether or not the tenancy conditions actually prevailing in any tract are a handicap to an increase in agricultural production should be carefully investigated. Such investigation is recommended.

(iv) The formulation of suitable remedial measures will depend on the results of investigation. The possibility of improving tenancy conditions through the spread of co-operation among farmers and the development of the principle of collective bargaining supplemented by arbitration, deserves to be examined.

(v) It should be recognized that occupancy-right-holders, particularly large landholders, have a duty to manage their lands to the best advantage and improve their productivity. The organization of large landholders in agricultural associations with the aim, among others, of improving the standard of cultivation is desirable. The methods by which the formation of such associations might be promoted and their activities stimulated and assisted by local officials, should be studied.

(vi) One of us (Sir Manilal Nanavati) considers that the crop-sharing system should be abolished by legislation; that the State should undertake the acquisition of land from large landholders for re-sale on reasonable terms to landless cultivators and small holders; or, in the alternative, that tenancy legislation should be undertaken with a view to fixing cash rents for lands held on the crop-sharing system and conferring occupancy-rights on the tenants. For the reasons stated in paragraphs 42 and 43, the Commission do not agree with these proposals.

E.—The Permanently-settled Estate System

47. The last of the three classes of land tenure problems to which we consider attention should be drawn, relates to the permanently-settled estate system. The view has been expressed that it is desirable that this system should be abolished and the ryotwari system introduced in its place. The evidence before us indicates that there is a growing body of opinion in favour of this view.

48. Towards the end of 1938, the Government of Bengal appointed a Commission to enquire into the system of land revenue in that province with special reference to the permanent settlement. The Commission submitted its report early in 1940, and recommended by a majority the abolition of the system and its replacement by the ryotwari system. A brief summary of the reasons which weighed with the majority in making this recommendation is given in Appendix II as well as the grounds on which the minority opposed it. The Government of Bengal have accepted the majority view in principle. They have also decided that operations should be undertaken on an experimental basis in the Faridpur district, and we understand that necessary action to implement this decision is proposed to be taken as soon as normal conditions return.

49. Apart from Bengal, the permanently-settled estate system exists in Bihar, Madras, Orissa, Assam and the United Provinces. In the United Provinces, the permanently-settled area is only about one-tenth of the total area of the province, and the Provincial Government have offered no comments on the

matter. The replies received from other Governments indicate general support of the view that the abolition of the permanently-settled estate system is desirable.

The Bihar Government hold the view that the permanently-settled estate system stands in the way of an increase in agricultural production and an improvement in the standard of life of the cultivating classes, and that it is desirable that the "abolition of the system should be seriously considered by the State." At the same time, they point out that "Government khas-mahals are not conspicuously superior to many private estates, nor is the standard of life of a raiyat in the raiyatwari provinces much superior to that of a raiyat in permanently-settled areas," and that it would be necessary to undertake "large scale reorganization of agriculture including co-operative farming, large scale irrigation and intensive and widespread application of all the well-known methods of agricultural development, besides providing outlets for surplus agricultural labour." The acquisition by the State of intermediate proprietary interests between the ryot and the State is conceived by the Bihar Government as a step which should be taken in order to facilitate these developments.

The subject is not so fully discussed in the replies from other Governments. *The Government of Assam* observe that "under the zamindari system there is a general feeling of insecurity and, short of abolishing this outmoded system, no other change will give the full result."

The Madras Government remark that the zamindari system appears to have outlived such usefulness as it may once have possessed, and many zamindars would welcome its abolition subject to reasonable compensation for the loss of their rights.

The Government of Orissa express the view that though the ryotwari system is preferable to the permanently-settled estate system, the "only possible remedy," namely, the abolition of the latter "does not seem to be a practical proposition at least for many years to come." They, therefore, consider that a better course would be to endeavour to remove its defects. They make two recommendations, namely, first, to require the zamindars, particularly of large estates, by legislation to set apart a certain sum every year for expenditure on irrigation facilities and protective works; and, secondly, to lay down by law that "no estate having a land revenue below Rs. 500 should be admitted to partition."

50. On a review of the foregoing replies, we have no hesitation in concluding that the programme of rural economic development which has to be undertaken in the immediate post-war period, will encounter special difficulties in permanently-settled areas. We recommend that enquiries should be undertaken in those provinces (other than Bengal) where the permanently-settled estate system

prevails, and a definite policy formulated in regard to the future of the system. Such enquiries should be directed to the following points:—

(i) What are the specific defects of the permanently-settled estate system as actually functioning in the province, as distinguished from those defects which are common to all the land systems in the country; and to what extent do they present difficulties in the way of improving agricultural production and increasing the standard of life of the cultivating classes?

(ii) What measures should be undertaken, as long as the system continues in order to remedy the defects and remove the difficulties in question?

(iii) What are the financial and administrative implications of the acquisition by the Government of interests intermediate between the ryot and the Government and the introduction of a ryotwari system?

We consider it necessary that the possibilities of reform of the system should also be investigated, because the financial and administrative implications of abolition may be such as to render it a long-drawn-out process. In fact, as we shall explain below, this is how the process is visualized by the majority of the Land Revenue Commission, Bengal.

51. The Land Revenue Commission, Bengal, estimated that, on the basis of compensation at 15 times the net profit, the total compensation payable to holders of proprietary interests would amount to Rs. 137 crores [1]. They also calculated that if this sum could be raised at 4 per cent, the additional net revenue accruing to Government as a result of the acquisition would be just about sufficient to discharge the debt in 60 years. One hundred and thirty-seven crores is a large sum of money—very nearly equal to the total capital outlay on all irrigation works carried out in British India up to the end of the year 1932–33—and the sum represents only the cost of acquisition in one province. The cost of acquisition in all areas where the permanently-settled estate system prevails, would be several times larger. From the financial point of view, therefore, it seems to us likely that the abolition of the system cannot be carried out *within a relatively short time*, without incurring financial commitments which might seriously restrict the resources of public borrowing available for other urgent schemes of development in the post-war period. Priority in the allocation

[1] The basis on which compensation should be assessed was a subject on which there was a division of opinion even among those members of the Land Revenue Commission who recommended the abolition of the system. Inasmuch as it was common ground between the majority and the minority of the Commission that, on the basis of compensation assessed at 15 times the net profit, the present income of the proprietors of the estates was likely to be reduced by approximately one half and that the reduction was likely to be even greater if compensation was assessed at 12 or 10 times the net profit, we have assumed in our report that the cost of acquisition estimated on the basis of 15 times the net profit is unlikely to be an overestimate of the financial liability involved.

of available resources should be given to large schemes of irrigation or industrial development which—unlike a scheme designed to replace one land system by another—are calculated directly to increase the productive resources of the country.[1]

Apart from the financial, there is also an administrative aspect. The revision of the record of rights is an essential preliminary to a scheme of State acquisition. The settlement operations necessary are of such a character that the Land Revenue Commission, Bengal, concluded that " it would not be possible to carry out a scheme of State acquisition in less than thirty years ". The Commission, having taken into account both the financial and administrative aspects of their recommendation, expressed the opinion that the work should be undertaken district by district, and as the work in each district was completed and the compensation assessed, loans may be raised by " instalments of perhaps 4 crores " for payment of compensation. This is the position in the only province in which the subject has been specially examined. Other provinces have not yet undertaken such an examination.

In these circumstances, we consider that the permanently-settled estate system is unlikely to be replaced by the ryotwari system within a relatively short period, and hence there is need for ensuring that the system functions properly, as long as it continues. We shall accordingly review in broad terms those aspects of the system which appear to us to call for reform.

Maintenance of irrigation sources

52. In those estates in which irrigation sources exist, it is a recognized obligation of the proprietor to maintain them. This obligation is in general not satisfactorily discharged. We have explained in a previous chapter[2] the important part which irrigation from private sources plays in providing water for agriculture, and the extent to which private irrigation works are in disrepair. The replies we have received from Provincial Governments indicate that neglect of irrigation sources is common in all permanently-settled areas. There are exceptions, no doubt, to any such general statement, and the standard of maintenance in some estates may be as good as in ryotwari areas, but in general, it is much lower and this must have an important effect on agricultural production.

[1] It has been suggested that there are other modes of compensation besides those considered by the Land Revenue Commission, Bengal, which can be devised and given effect to without resort to borrowing. Thus, the capitalization of the net profits of proprietors might be avoided altogether and a system of annuity payments, to be made out of the additional revenue resources acquired, might be feasible. We have not had an opportunity to investigate the possibilities of these suggestions, and we note that it may not be possible to avoid capital payments in cash or bonds in many cases, such as, small proprietors or creditors, and there would in any case have to be a guarantee by the State of annuity payments. In these circumstances, we think we are right in assuming that a change in the mode of compensation visualized by the Land Revenue Commission, Bengal, may not materially alter the conclusion reached by that Commission that it would take 30 years to replace the present land system by a ryotwari system.

[2] Chapter I of Part III.

We have referred already to the enactments intended to deal with this evil, e.g., the Bihar Private Irrigation Act, of 1927, the Bengal Tanks Improvement Act, 1939, and the Madras Irrigation Works (Repair, Improvement and Construction) Act of 1943. While we welcome these measures as steps in the right direction and have suggested their strict enforcement, we feel that more effective remedies are required. It is not sufficient that Government should be in a position to carry out works which proprietors ought to have carried out but failed to do. It is necessary to ensure that proprietors realize their responsibilities and carry out the necessary works.

Incidence of rent payable by occupancy-right-holders

53. It was made abundantly clear by the Land Revenue Commission that, so far at least as Bengal is concerned, the incidence of *rent* payable by occupancy-right-holders is not a serious problem. On this question, there is no disagreement between the majority and the minority of the Commission. The Commission visited Madras, the United Provinces and the Punjab, and found that, in relation to the value of the gross produce, the *rent* paid by ryots in Bengal was, subject to certain exceptions, smaller than the *revenue* paid by ryots in Madras and the Punjab, and much smaller than the *rent* paid by tenants of temporarily-settled estates in the United Provinces. The Commission came to the conclusion that on all relevant standards of comparison, " there would be justification for enhancements rather than reductions of rent in Bengal." This did not, however, mean that rents were of the same low pitch in all estates; " there are high contractual rents in Bengal which could certainly not be enhanced and would even be reduced if the systems of assessment in force in other provinces were applied to those particular tenancies." We have not seen the results of a similar investigation into the incidents of rents in permanently-settled areas of other provinces. The impression we gain, however, from the replies received from the Provincial Governments is that rent tends to be high where it is paid in kind, and that it bears a smaller proportion to the value of the gross produce where cash rents prevail. This is particularly the case to-day when the price of produce is high.

In these circumstances, we think it would be desirable from the point of view of improving agricultural production, and also expedient for the purpose of decreasing arrears of rent and litigation; that the law should prescribe a maximum rate of rent payable by ryots to proprietors of permanently-settled estates.

54. How is this statutory maximum rent to be fixed? We think this should be investigated. Our suggestions based on such material as we have been able to consider are as follows:—

(i) It has been suggested that in Madras the rents prevailing in permanently-settled estates can be compared with the land revenue assessment on ryotwari lands. Where such comparison is possible, the statutory maximum rent should be fixed with reference to the rates of land revenue payable on ryotwari lands—and if such

rates differ, the highest of such rates. We commend this suggestion for consideration in those areas where its application is practicable.

(ii) This method may not be practicable in Provinces of the Eastern Region, and another basis may have to be found for defining the statutory maximum.

(*a*) It has been suggested that, where produce-rents prevail, one-third of the gross produce should be prescribed as the statutory maximum of rent in kind payable by ryots. The Land Revenue Commission, Bengal, considered this to be a suitable limit in respect of the crop-sharing tenants of Bengal to whom they proposed that legal protection should be extended. The same ratio has been also put forward as suitable by the Orissa Government.

As an alternative it has been suggested that the statutory maximum of rent in kind should be fixed as one-half of the net produce. This would have the effect of approximating the statutory maximum in permanently-settled estates to the theoretical maximum accepted as the basis of ryotwari settlements in the past. It could not, however, be automatically applied and it would be necessary to define (by law or statutory rule) a certain quantity of produce per acre as representing the average cost of cultivation, and declare this quantity to be exempt from division. The maximum rent in kind would then consist of one-half of the produce which remains after the amount exempted from division is excluded from the gross produce.

(*b*) If the statutory maximum rent is fixed in accordance with either of these two criteria, it would be easy of application where produce-rents prevail. Where, however, cash rents are the rule, it would be necessary to devise a method by which it could be ascertained whether a cash rent exceeds the statutory maximum. We suggest the following as a suitable criterion. The test would be whether a ryot who complains that a cash rent is excessive, is prepared to change over to a rent in kind at the maximum rate prescribed by law. If he is, it may be fairly presumed that the cash rent is excessive. In such cases, a simple procedure should be evolved to facilitate agreement between the proprietor and the ryot on a reduced cash rent or, failing such agreement, for a change-over to the statutory maximum rent in kind.

Arrears of rent and litigation

55. In many estates (though not again in all) ryots owe large arrears of rent to proprietors and there is a considerable amount of litigation. This is due to two causes. First, the standard of management is not satisfactory, regular accounts are not kept, and a staff of the requisite calibre is not employed, with the result that rent is not collected as efficiently as by Government agencies under the ryotwari system. Secondly, the procedure for the coercive recovery of arrears of rents is generally not as simple as that for the recovery of arrears of land revenue. In certain permanently-settled areas, notably in Bengal, where, as the Land Revenue Commission found, " the procedure is expensive and harassing both to landlord and tenant and . . . unnecessarily cumbrous and

dilatory . . . When rent suits are defended, the amount paid on account of costs, lawyers' fees, and the numerous journeys to and from the civil courts are out of all proportion to the rent claimed . . . The disposal of rent suits . . . not infrequently takes three or four years, which means that a landlord who is suing for three years' arrears may receive nothing for seven or eight years." The two causes we have mentioned are to some extent connected. For, if estates are managed efficiently, proper accounts kept, and a trustworthy staff employed, not only would the arrears, to be recovered by coercive process, be much smaller than they are at present, but there would also be less justification for maintaining cumbrous and dilatory processes as a safeguard against oppressive proceedings on the part of proprietors. The true line of reform in this connection consists not merely in simplifying the process of recovery of arrears but also in taking steps to secure an improved standard of management.

Lack of contact between Government and the people

56. This, in our opinion, is the most important among the considerations advanced by the Land Revenue Commission in favour of the abolition of the system. The point is stressed by the Government of Bihar. In our report on Bengal, we drew attention to the absence of a subordinate revenue establishment in that province, comparable with that maintained in temporarily-settled provinces, and pointed out how such an organization would have been of the greatest value to the Government of Bengal, in dealing with the food situation in 1943. Elsewhere in our present report, we have explained how, in view of this handicap, it is not possible for provinces like Bengal and Bihar to adopt schemes of procurement and distribution involving full monopoly. Such schemes have been introduced with success in areas under the ryotwari system. It is important that this weakness should be remedied; since the need for an efficient organization in rural areas will not disappear with the end of the war but will, on the contrary, increase, if post-war schemes of rural development are to materialize. One of the advantages of a scheme of State acquisition of proprietary interests, is that the resources which at present are applied by proprietors to the management of their estates, would become available to Government for the establishment of an official organization for the collection of revenue and the maintenance of village records. As long, however, as the permanently-settled estate system prevails, the maintenance by Government of an organization comparable with that in ryotwari areas, is likely to prove difficult and disproportionately costly. If, however, steps are taken—and we have pointed out that this is necessary for other reasons—to ensure that the standard of management of estates is improved and a qualified and efficient staff employed, we think it should be possible to secure the performance through the proprietors of many functions which are at present performed in ryotwari areas by an official staff. The proprietors and their staff are, and necessarily have to be, in contact with the ryots in permanently-settled areas to the same extent as the revenue establishment in

ryotwari areas. There is, in our opinion, no good reason why they should not maintain accounts and records similar to those maintained by official agencies in ryotwari areas; nor is there any reason why they should not be required to engage themselves in those aspects of rural development which are likely to become of increasing importance in the future.

Contribution to economic development

57. We have little doubt that much of the unpopularity of the permanently-settled estate system is due to the fact that, by and large, and subject to notable exceptions, proprietors fail to make an adequate contribution to the development of the resources of their estates. There are, of course, instances of estates which have set apart in the past considerable funds for religious and charitable purposes, and sometimes for the improvement of education and public health. If these had been more numerous and if, further, proprietors as a class had taken an interest in developing irrigation, providing other facilities for the improvement of agricultural production and the promotion of rural welfare generally, we doubt whether the defects of the system would have acquired so great a prominence. We think that one of the objectives of any scheme for the improvement of the management of estates, should be the raising of management standards among the general body of proprietors to the level of those of the best among them. They should be required to set apart a proportion of their net profits for utilization in a manner which would promote the improvement of agriculture and the standard of life of the cultivating classes in their estates.

Removal of defects in permanently-settled estate system

58. The removal of the defects in the permanently-settled estate system described above cannot be effected unless Government assumes the necessary powers of supervision and control. The fact has to be faced that, under the permanently-settled estate system, the proprietor functions as a private individual only in so far as the cultivation of his homefarm lands is concerned. In all other respects, the proprietor has to perform functions which are of substantially the same nature as those performed by the Revenue Department of Government in ryotwari areas, and of no less public importance. The criticisms of the permanently-settled estate system amount really to this—that public interest is not as well served by the private agency in question as by the corresponding Government agency functioning in ryotwari areas. This fact is becoming a matter of increasing public importance, in view of the widening scope of the activities of Government. It seems to us, therefore, necessary that Government should accept responsibility for ensuring that this private agency functions properly. Public interest justifies the assumption of the necessary powers by Government.

59. A policy of reform of the permanently-settled estate system would, therefore, require the enactment of legislation conferring power on Government to prescribe the standard of management

which proprietors of estates should be required to maintain, and empowering administrative authorities to exercise such functions as may be necessary to secure it. The law should also provide sanctions against non-fulfilment of obligations thus laid on the proprietors. The standard of management which we refer to should include in particular (*a*) an adequate system of records and accounts and the employment of personnel qualified to maintain them; (*b*) the adequate maintenance of irrigation sources; (*c*) the localization of cases where the existing rent exceeds a prescribed legal maximum and the reduction of rents in such cases; and (*d*) the annual allocation of funds (the amount of which would be fixed with reference to the resources of the estate) to be utilized for specific purposes (laid down by law) in furtherance of rural development.

60. In some permanently-settled areas proprietary under-tenure holders are likely to present a serious problem. The true nature of this problem is often misunderstood, and it is sometimes inferred, from the mere fact that a large number of intermediaries intervene between the proprietor who pays the land revenue of the estate, and the ryot who possesses the right of occupancy, that the burden of rent on the ryot must be heavy. This is an erroneous view; as the Bengal Land Revenue Commission pointed out: "Ordinarily it (subinfeudation) does not mean that the cultivator has to pay a higher rent. It is a division of the rent payable by the cultivators among various grades of landlords and it is made possible in areas where there is a wide divergence between the rate of rent paid by the ryot and the revenue which the zamindar pays." The real objection to subinfeudation from the point of view we are considering, is that it would be inconsistent with any scheme of reform which is based on the principle of defining the responsibility for the management of estates and enforcing such responsibility. Such reform requires that there should be no more than one intermediary between the occupancy-right-holder and the Government. In other words, the principle of "One estate, one proprietor" should be accepted. This may be effected in more ways than one. Thus, the portion of an estate which is subject to an "under-tenure" might be formed into a separate estate. This would be a suitable course where the resources of the under-tenure are large. Alternatively, provision may be made for the compulsory amalgamation of a smaller unit with the estate of which it forms part, the interest of the under-tenure-holder being converted into a fractional share of the main estate. A third course which may be suitable in areas where permanently-settled estates and ryotwari lands are intermixed, would be for the rights in such estates to be acquired by Government. Which of these methods would be the most suitable would have to be decided with reference to the circumstances of each estate.

61. It is also likely that in areas where the process of subdivision and fragmentation of estates has already gone far, the estates may be so small and their resources so exiguous that they cannot maintain the high standard of management which we regard as essential, if the system is to function efficiently and in the

public interest. Further, the existence of an unduly large number of very small estates may add greatly to the difficulties of maintaining proper supervision and control over the management of estates. There is thus a problem of what may be called "uneconomic estates"; and in these cases also, it may be necessary to resort either to compulsory amalgamation with the estates from which they may have been originally separated, or to acquisition by the State.

We fully recognize the difficulties attending reform, particularly in areas where subinfeudation is extreme and has reached, as in parts of Bengal, fantastic proportions. But we feel convinced that the possibilities of reform should be investigated and we would hope that many proprietors would, in their own interests, willingly accept measures designed to ensure that proprietors as a class fulfil their obligations.

One of us (Sir Manilal Nanavati) is not in agreement with us on this subject. His views are contained in a separate minute.

Summary of conclusions and recommendations

62. We may summarize our main conclusions on this subject as below:—

(i) The programme of rural economic development which has to be undertaken in the immediate post-war period, will encounter special difficulties in those areas where the permanently-settled estate system prevails.

(ii) A comprehensive enquiry into the permanently-settled estate system has been carried out in Bengal. It is necessary that enquiries should be undertaken in those provinces (other than Bengal) where the system prevails, and such enquiries should be directed to the following points:—

(*a*) What are the specific defects of the permanently-settled estate system as actually functioning in the province, as distinguished from those defects which are common to all the land systems in the country; and to what extent do they present difficulties in the way of improving agricultural production and increasing the standard of life of the cultivating classes?

(*b*) What measures should be undertaken, as long as the system continues, in order to remedy the defects and remove the difficulties in question?

(*c*) What are the financial and administrative implications of the acquisition by the Government of interests intermediate between the ryot and the Government and the introduction of a ryotwari system?

(iii) On the basis of the results of such enquiries, a definite policy should be formulated in relation to the future of the system. The further conclusions which follow are put forward as tentative results of a preliminary study of the subject, to be taken into consideration when the enquiries we have recommended are made.

(*a*) Having regard to its financial and administrative implications, it appears unlikely that the replacement of the permanently-settled estate system by the ryotwari system will be carried out within a relatively short period. There is, therefore, need for ensuring that the system functions properly as long as it continues.

(*b*) The more important features of a policy of reform have been discussed in paragraphs 52 to 57, and summarized in paragraph 59. Such a policy cannot be implemented and the defects of the system cannot be removed unless Government assumes powers of supervision and control over the management of estates. The assumption of such powers is justified in the public interest.

(*c*) A policy of reform is likely to meet with special difficulties in areas where subinfeudation prevails. In such cases, suitable methods would have to be devised for giving effect to the principle of " one estate, one proprietor."

(*d*) Where subdivision and fragmentation of estates have already gone far, " uneconomic estates " would present a problem which may have to be solved by either acquisition or compulsory amalgamation.

CHAPTER II.—OTHER RURAL ECONOMIC PROBLEMS

A.—Agricultural Prices

One fact clearly emerges from a study of agricultural economy in its various aspects during the decade preceding the war; it is the fundamental importance of the maintenance of agricultural prices at a reasonable level. The development of agriculture, which is so essential, cannot take place unless, first, the cultivation of land remains a more paying business than it was in the decade before the war, and, secondly, all engaged in the business feel assured that it will remain so. Neither of these two conditions is likely to be satisfied unless the stabilization of agricultural prices is accepted as an essential part of Government policy and there is confidence in the ability of Government to ensure it. The following passage[1] from our evidence illustrates the importance of the price factor:—

"After four years of strenuous effort, the movement in one district was pulsating with life; the approach had been mainly agricultural—the provision of good seed and water facilities. The people who had avoided co-operatives were clamouring for them to be started in their villages and we were refusing applications every day. Then came the crash in prices. The work of years was undone in as many weeks. The old feeling of helplessness and hopelessness returned; it was no use fighting against fate; all this talk of increased production was but a device to bring down prices. The collapse was—or at least appeared to us then to be—complete. Realizing that we had tried to build an arch and neglected the keystone, we took up the question of a minimum price for sugarcane. After years of struggle, that became an accomplished fact. On this basis, utilizing the earlier foundations we built again; the co-operative cane marketing societies are the finest example of co-operative effort and success in India. In these societies we linked up credit with farming on the one hand and marketing on the other. But the whole structure would collapse if there were no minimum price for cane. Given price stability, much can be done by linking up credit, agricultural improvements and marketing so as to supply the facilities needed for agriculture; whether water or manure or seed or machinery or organization. Without it we are building on sand."

2. The principle involved is well recognized not merely in India but in most countries of the world. The United Nations Conference on Food and Agriculture (1943) accepted it and made

[1] Remarks of an officer, based on his personal experience of the vicissitudes of the co-operative movement in one of the major provinces.

a recommendation on the action required, on an international plane, for giving effect to it. The recommendation runs as follows:—

"*XXV. International commodity arrangements.*

Whereas—

1. Excessive short-term movements in the prices of food and agricultural commodities are an obstacle to the orderly conduct of their production and distribution;

2. Extreme fluctuations of the prices of food and agricultural products aggravate general deflationary and inflationary tendencies, which are injurious to producers and consumers alike;

3. The mitigation of these influences would promote the objectives of an expansionist policy;

4. Changes in the scale and character of production to meet more effectively the world's need for food and agricultural products may in certain instances require a period of transition and international co-operation to aid producers in making necessary readjustments in their productive organization;

5. International commodity arrangements may play a useful part in the advancement of these ends but further study is necessary to establish the precise forms which these arrangements should take and whether and to what extent regulation of production may be needed;

The United Nations Conference on Food and Agriculture recommends—

1. That international commodity arrangements should be designed so as to promote the expansion of an orderly world economy;

2. That, to this end, a body of broad principles should through further international discussion be agreed upon regarding the formulation, the provisions, and the administration of such international commodity arrangements as may be deemed feasible and desirable and should include assurance that—

(*a*) Such arrangements will include effective representation of consumers as well as producers;

(*b*) Increasing opportunities will be afforded for supplying consumption needs from the most efficient sources of production at prices fair to both consumers and producers and with due regard to such transitional adjustments in production as may be required to prevent serious economic and social dislocations;

(*c*) Adequate reserves will be maintained to meet all consumption needs;

(*d*) Provision will be made, when applicable, for the orderly disposal of surpluses;

3. That an international organization should be created at an early date to study the feasibility and desirability of such arrangements with reference to individual commodities and, in appropriate cases, to initiate or review such arrangements to be entered into between Governments in accordance with agreed principles, maintaining close relation with such programmes as may be undertaken in other fields of international economic activity to the end that the objective of raising consumption levels of all peoples may be most effectively served."

3. We have quoted the above recommendation mainly to reinforce our view that a policy of stabilization of agricultural prices is necessary and desirable, and partly to bring out the fact that the successful implementation of such a policy will require some measure of international co-operation. This does not, however, mean that Governments in this country should postpone taking action within the country until international commodity arrangements are devised and put in operation; or that they should give up the attempt to maintain a stable price level if, unfortunately, such international arrangements fail to materialize. We fully realize the interdependence of world economy, and the need that India should pursue policies and methods in harmony with the rest of the world. The arrangements made within the country should, therefore, be such as to be capable of being dovetailed into a co-ordinated system of international exchange of goods and services. International commodity arrangements however, can only be the superstructure of an edifice of which the foundation and the most important parts must be built in each country by the Governments concerned.

4. On this subject we put the following question to the Provincial Governments:—

"During the economic depression of the early thirties, the agricultural classes were hard hit as a result of an unduly low level of prices of foodgrains. On the other hand, it has been found necessary during recent years to adopt various measures for preventing prices of foodgrains from rising too high and thereby causing serious hardship to the consumers. In view of this experience, do you consider that Government should, in the future, accept responsibility for maintaining even in normal times a system of regulated prices for foodgrains?

If so, discuss to what extent the various control measures at present in force and the system of supply and distribution developed recently would have to be retained even in normal times. Outline a scheme of measures which, in your opinion, would constitute a workable system of regulated prices and ensure a fair minimum price for the agriculturist and a fair maximum for the consumer and prevent undue fluctuations."

An abstract of the replies received is annexed to this report [1]. It will be seen that ideas have not yet crystallized as to the "scheme of measures which would constitute a workable system

[1] Section B of Appendix IV.

of regulated prices and ensure a fair minimum price for the agriculturist and a fair maximum for the consumer, and prevent undue fluctuations." We would draw attention to the opinions expressed on this subject by the Governments of Sind and Orissa.

We understand that a Sub-Committee of the Policy Committee on Agriculture, Forestry and Fisheries, is at present considering "(*a*) the principles on which producers' prices of agricultural produce . . . should be fixed and (*b*) the means by which such prices can be made effective and an assured market be provided." The evolution of a scheme of regulation of prices must necessarily be based on a full examination of all aspects of the complex problem, and that Committee is at present engaged in such an examination. We, therefore, propose in this report merely to draw attention to those aspects of the problem which emerge from our review of the food situation during the last three years, the nature of the measures taken to control the situation, and the lessons they offer for the future.

5. The first point to be stressed is the relative importance of the prices of food crops as compared with other agricultural prices. This is illustrated by the following table showing areas under different crops in British India on an average of the five years ending 1938–39:—

	Area (in million acres).	Percentage.
I. All foodgrains, pulses, and other food-crops (exclusive of edible oilseeds)	197·55	80·9
II. Cotton, jute, and other fibre crops	17·98	7·4
III. Oilseeds	14·93	6·1
IV. Fodder crops	10·39	4·3
V. Other miscellaneous crops ..	3·24	1·3
	244·09	100·0

These figures show that rather more than four acres out of every five were cultivated with food crops, which are mostly cereals and pulses. (The area under other food crops including sugar is relatively small, viz., only 4·4 per cent.) The figures bring out the extent to which the economy of agricultural production must be bound up with the level of prices of food crops. It is true that the proportion of the yield of food crops which comes into the market is smaller than in the case of other crops; but even if allowance is made for this, it is clear that food crops must represent a large proportion of the market supply of agricultural produce. Further, food prices represent the most important element in the cost of living of the mass of the non-agricultural population and therefore constitute a predominant factor in the general level of wages. The general stability of the economy of the country depends far more on the stability of food prices, than on that of the prices of all other commodities taken together. This conclusion is confirmed by the experience of the country during the war.

6. The second point to be emphasised is the relative importance of the prices of rice and wheat as compared with the prices of other cereals and non-cereal food crops. The area under rice and wheat is nearly one-half of the area under all food crops, and the relative proportion of the yield of rice and wheat is much higher. They are also practically the only food crops which enter in large quantities into long-distance trade within India, besides being the only food crops directly affected by supply and price conditions prevailing in world markets. We believe, therefore, that stability of prices over the whole range of food crops is primarily dependent on the stability of prices of rice and wheat. If the prices of rice and wheat are successfully held by Governmental action within predetermined limits, the prices of other cereals and many non-cereal food crops will tend to adjust themselves within corresponding limits.

7. The hard core of the problem of stabilization of agricultural prices generally (and indeed of the general structure of prices and wages in the economy of the country as a whole) is thus the stabilization of the prices of rice and wheat. It is necessary to stress this fact because a detailed investigation of the general problem of price stabilization is likely to bring out special difficulties in the case of such commodities as cotton, jute, and oil-seeds, of which a large proportion enters into international trade. Since, in general, the prices of all goods and services are to some extent inter-dependent, the conclusion may be reached that price stabilization is impracticable in normal times. We are anxious that such a conclusion should not be drawn, as we are convinced that it would be fatal to the successful execution of the food policy which we have recommended. We therefore emphasize the necessity and importance of taking measures to maintain the prices of rice and wheat within predetermined limits, even if it should be found that the prices of other commodities cannot be regulated. This does not imply that it is not necessary to maintain a fair level of prices for such commodities as cotton, jute, or oil-seeds. This, too, is clearly necessary. But we are of opinion that the problems involved and the methods of regulation required may be different, and the degree of success achievable by Governments in India may be more largely dependent on the state of supplies and prices in world markets of these commodities than in the case of rice and wheat. Our conclusion is that the policy of price-stabilization in respect of rice and wheat should be given effect to in normal times, irrespective of any action that may have to be taken in respect of other commodities.

8. As regards the methods to be adopted, we think reliance should be placed very largely on the practical experience of food administration in this country during the war. Study of the systems in force in other countries has its uses but may prove misleading unless full allowance is made for differences in conditions. In our view, therefore, the course that should be followed, is the progressive adaptation of the existing system of food

administration to changing conditions, step by step, until what may be regarded as normal conditions are established. It is from this point of view that we have tried to visualize the immediate post-war period and framed the recommendations set out in Chapter VI of Part I. Hence we attach great importance to those recommendations from the long-term point of view. We have indicated the basis on which, in our view, it would be desirable to fix the price-maxima and price-minima to be maintained during the transition period. We have also pointed out that the essential requisites for keeping prices within these limits, viz., the control of imports under the Basic Plan, the possession of buffer stocks and an organization for making purchases and sales in the market, would all be present during the transition period. Experience gained during this period will, in our opinion, provide the data on the basis of which the price-maxima and price-minima to be maintained during a subsequent period can be settled, and indicate the measures to be taken by the Governments concerned for maintaining prices within those limits. We may also refer to our recommendation about the establishment of an All-India Food Council and indicate our view that the process by which future schemes of regulation of prices of rice and wheat may be settled and periodically revised, should be one of agreement between the Centre, the Provinces and the States, effected on the advice of the All-India Food Council.

9. In this section we have dealt with the problem of the stabilization of market prices. There remains of course the problem—quite a different one—of ensuring that the margin between the prices received by the producer and that paid by the consumer is not excessive. This is largely a question of marketing, a subject which was dealt with by the Royal Commission on Agriculture, and the Central Banking Enquiry Committee. We have not, however, been able to undertake an examination of this extensive subject and must, therefore, content ourselves with drawing attention to its importance and the recommendations of the bodies referred to above.

10. One of us (Sir Manilal Nanavati) who is in agreement with the foregoing conclusions, desires to draw attention to a probable effect of the stabilization of prices on agricultural economy. He thinks it will render the purchase of agricultural land a more attractive proposition for investors and money-lenders and thereby lead to an increase in the holdings of non-agriculturists who let out their lands to crop-sharing tenants. He, therefore, suggests that, in order that the full benefit of price stabilization may be realised, the latter should be accompanied by measures of land reform designed to prevent such a development.[1]

[1] In support of his argument Sir Manilal draws attention to the warning given by the President Committee on Tenant Farming, in the United States of America, that while adjusting farm prices unless this is accompanied by other measures of land reform "it may redound largely to the advantage of absentee landlords and credit interests and may be more or less nullified through capitalization in land values."

We have already explained, in a previous chapter, our views on the crop-sharing system of cultivation. We are unable to agree that this type of cultivation would necessarily increase as a result of stabilization of prices. If agriculture is made more secure and more profitable than during the decade before the war—and we are all agreed that this is necessary—presumably the small holder would not be under the same pressure to sell, and this would offset the greater attractiveness of land to the non-agriculturist investor. We are of opinion that the issues relating to stabilization of prices should be decided independently of the reform of the land system.

Summary of conclusions and recommendations

11. (i) the maintenance of agricultural prices at a reasonable level is a factor of fundamental importance in agricultural economy.

(ii) The United Nations Conference on Food and Agriculture accepted the principle involved in the above proposition and made a recommendation on the action required, on an international plane, for giving effect to it.

(iii) A scheme for the regulation of agricultural prices must be based on a full examination of all aspects of the complex problem. A sub-committee of the Policy Committee on Agriculture, Forestry and Fisheries is, at present, engaged on such an examination. Attention is, therefore, directed in this section to the lessons to be drawn from measures taken during the war to control the food situation in India.

(iv) The first point stressed is the importance of the prices of food crops as compared with other agricultural prices, in the economy of the country.

(v) The second point emphasized is the importance of the prices of wheat and rice as compared with the prices of other cereals and non-cereal food crops.

(vi) The hard core of the problem of stabilization of agricultural prices, is therefore, the stabilization of rice and wheat prices. It is accordingly recommended that a policy of stabilization of the prices of wheat and rice should be adopted irrespective of any action in respect of other commodities.

(vii) Importance is attached to the recommendations made in Chapter VI of Part I in regard to the fixation of maximum and minimum prices during the transition period after the war and the measures to be taken for keeping prices within those limits. During this period the essential requisites for price control, viz., control of imports, the existence of buffer stocks and an organization for making purchases and sales in the market, would all be in existence.

(viii) It is considered that experience gained during the transition period will provide data for determining the upper and lower limits within which prices should be maintained in subsequent years, and will indicate the measures to be taken for maintaining prices within those limits.

(ix) One of us (Sir Manilal Nanavati) considers that the full benefit of price stabilization cannot be realised unless it is accompanied by measures of land reform. The rest of us take the view that the issues relating to stabilization of prices should be decided independently of the reform of the land system.

B.—Rural Credit

12. A large volume of information on the subject of rural credit was assembled by the various Provincial Banking Enquiry Committees, and a detailed discussion of all its problems is to be found in the Report of the Central Banking Enquiry Committee of 1931. A certain amount of information about the present position is contained in the replies we have received from Provincial Governments, of which an abstract is annexed to this report [1]. We do not propose to traverse the ground so fully surveyed by the Central Banking Enquiry Committee and shall merely supplement the recommendations made by that Committee, in certain respects, with reference to our appreciation of present conditions.

The supply of rural credit, particularly credit required by the middle and poorer classes of cultivators, is provided in the main by the rural money-lender. The amount supplied by Provincial Governments and by the Co-operative movement is relatively small, and joint stock banks "play little part in the supply of credit to the agriculturists and do not look upon agricultural finance as part of their general business." The Central Banking Enquiry Committee referred to the "very small share of the finance required by agriculturists" provided by the Government under the Land Improvement Loans Act, and the Agriculturists' Loans Act, and gave figures illustrating "the very insignificant part played by Government in the matter of supplying rural finance." The replies received from Provincial Governments indicate that, apart from the provision of credit under the Grow More Food campaign, the position continues to be the same as in 1931.

The co-operative movement

13. The volume of credit supplied by the co-operative movement is larger than that supplied by Government. The proportion of the rural population benefited by the movement is indicated by the figures in the following table [2]:—

Province.	Percentage of members of agricultural credit societies to families in rural areas.
North-West Frontier Province	0·2
United Provinces	1·8
Central Provinces and Berar	2·3
Assam	2·9
Bihar (cum Orissa)	3·1
Bengal	3·8
Madras	7·0
Bombay (cum Sind)	8·7
Punjab	10·2

[1] Appendix III.

[2] Report of the Royal Commission on Agriculture in India (1928), paragraph 872.

These figures indicate the position in 1926—27. The following table[1] shows the growth of the movement since that date:—

Year.	Number of societies (in thousands).	Number of members (in millions).	Working capital (in crores of rupees).	Loans issued (in crores of rupees).
1927	71	3·06	57·57	35·10
1936	89	3·95	88·07	34·33
1941	124	5·63	98·48	40·89

These figures relate to all societies, and not merely rural credit societies; but they serve to indicate, first, that the movement is extending, secondly, that the rate of growth was slow during the thirties and thirdly, that the pace of expansion has considerably quickened during the five years ending 1941. The fact that the movement is expanding is encouraging. But, if we consider the figures in the two foregoing tables, it is clear that the percentage of the population served by the co-operative movement is still very small. Further, few societies provide regularly the entire credit needs of their members and hence in many areas it is common, as the Bombay Government have remarked, for the "co-operative societies to be regarded as an additional *sowcar*." Finally it should be remembered that a mere statement of numbers is liable to be misleading. Some societies "flourish for a short time and then die an unnatural death"; many societies which live longer on paper have no real vitality. Among those which actually function, the standard of efficiency varies greatly. The following table[2] shows the percentage of societies which are regarded as being in a generally sound and flourishing condition and therefore classified as A or B (according to the standards laid down by the Registrars' Conference of 1936):—

Province.	Number of societies.	Percentage of societies classed as		Total.
		A	B	
Bengal	37,707	0·1	1·3	1·4*
Punjab	24,322	2·2	14·2	16·4
Madras	13,759	3·9	15·4	19·3
United Provinces ..	10,858	0·1	1·5	1·6
Bihar	7,762	0·9	6·4	7·3
Bombay	5,126	5·5	25·2	30·7
Central Provinces and Berar	4,764	0·3	5·2	5·8
Orissa	2,704	0·4	2·8	3·2
Assam	1,551	0·6	5·7	6·3
Sind	1,397	1·7	28·8	30·5
North-West Frontier Province	822	1·6	8·1	9·7

[1] "Satistical Summary of the Social and Economic Trends in India in the inter-war period" (1945) issued by the office of the Economic adviser to the Government of India.

[2] Review of the Co-operative Movement in India, 1939-40, issued by the Agricultural Credit Department of the Reserve Bank of India.

* 26·4 per cent unclassified.

The private moneylender

14. It is thus evident that the agency effectively serving rural areas is the private money-lender. There are two classes of these money-lenders; one, the more common, is the professional money-lender who combines his business with trading in village produce; the other is the non-professional money-lender who is drawn in most cases from the ranks of landowners and well-to-do agriculturists. The Central Banking Enquiry Committee noted that the latter class was coming into prominence in some provinces, especially Madras and the Punjab. The replies[1] received from Provincial Governments indicate that this tendency is increasing. All the Provincial Committees, as well as the Central Banking Enquiry Committee, were practically unanimous in the opinion that the private money-lender was an indispensable feature of Indian rural economy. "He is easily accessible. His methods of business are simple and elastic. He maintains a close personal contact with the borrower often having hereditary relations with the family of the borrower. His local knowledge and experience and his presence on the spot enable him to accommodate persons without tangible assets and yet protect himself against losses." The evils of the system are, first, that though there has been a reduction from the unconscionable high rates of interest of the past, the rates are still high in many parts of the country; secondly, that the professional money-lender tends to abuse his influence over the debtor, particularly in order to secure possession of the latter's saleable produce at a low price, and similarly, the non-professional money-lender often advances money with a view to the eventual acquisition of the debtor's land. Like all general statements, these must be subject to exceptions. It should also be recognized that there are two parties to the business of money-lending, and the defects of the system are attributable in part to weaknesses of character among borrowers and not entirely to the avarice of lenders. We think it is inevitable that the private money-lender will continue, for a long time to come, to be the main agency for the distribution of rural credit, particularly short-term and intermediate-term credit. Policy in relation to rural credit must be based on the acceptance of this fact, as well as on the recognition of the need for improving the working of the system. Reforms are necessary which would protect honest borrowers and lenders alike, which would ensure the maintenance of fair and equitable relations between them, and which would not only increase the supply of credit for productive purposes but also diminish the supply of credit for avoidable unproductive purposes. To this end, we consider it necessary (i) that the money-lending business should be licensed; (ii) that the reciprocal obligations of the lender and the borrower should be regulated by law in such matters as the interest chargeable on different types of transactions, the maintenance of proper accounts, the periodical settlement of accounts, etc., and (iii) that adequate machinery

[1] Appendix III.

should be established for administering the licensing system and reviewing the effect of regulation, with a view to a continuous improvement in rural credit facilities.

The licensing and control of moneylenders

15. The question of the licensing and control of money-lenders was fully examined by the Central and Provincial Banking Enquiry Committees. A system of compulsory registration of money-lenders was recommended by the Provincial Committees of the Central Provinces and Bengal. Other systems involving registration were proposed by the Provincial Committees of Madras and Bihar. The United Provinces Committee, although they made no concrete recommendations, referred to various suggestions made to them on this subject. The Committees of the Punjab, Bombay and Assam were, however, opposed to registration. The Central Banking Enquiry Committee did not accept any of these recommendations and held that " a real and lasting solution can only be found by the spread of education, the extension of co-operative and joint-stock banking, and by the training of the borrower in habits of thrift and saving; " and, in the meanwhile, commended the Punjab Regulation of Accounts Act, 1930, to all Provincial Governments for consideration. They also pointed out the possibilities of a better utilization of the Usurious Loans Act, 1918.

16. Experience, however, has shown the inadequacy of these conclusions and there is now a general trend of opinion in favour of a system of licensing and control of money-lenders. The results of experience in the Punjab are clear. We have been informed by the Government of that province that—

" the Usurious Loans Act, 1918 . . . practically remained a dead letter though it was capable of being worked to the advantage of the debtors. The Punjab Regulation of Accounts Act, 1930, seeks to regulate the money-lender's business. It requires all money-lenders to use regular account books and to furnish each debtor bi-annually with a legible statement of accounts, showing not only the amount outstanding but also all loan transactions entered into during the past six months. It also provides for the keeping of separate accounts of the money-lender from that of his accounts as a shop-keeper where he combined the two vocations. These provisions were mostly gnored and evaded until the enactment of the Money-lenders Registration Act, 1938, which provided severe penalties for their non-observance . . . The Punjab Registration of Money-lenders Act of 1938 aims at regulating the business of the money-lender on the lines of the British Money-lenders Act, 1937. According to this Act, every money-lender is to apply for the registration of his name at the office of the Collector of the district; and the registration fee is Rs. 5. He is also to apply for the licence which will be granted to him for such period, in such form, on such conditions and on payment of such fees as may be prescribed. The licence shall be renewed after the expiry of the prescribed period. But his licence is liable to be cancelled, if after the coming into force of this Act he is found

guilty of dishonesty and fraudulent practice in his business or is found by a court to have charged higher rates of interest than those prescribed under the Relief of Indebtedness Act, in more than one suit or has been held by a court to have contravened the provisions of section 3 of the Punjab Regulation of Accounts Act in more than two suits. If a money-lender is not registered and does not hold a valid licence, any suit instituted by him for the recovery of a loan or the execution of a decree relating to a loan shall be dismissed after this Act came into force. Power has also been given to the Commissioner of granting to the money-lender (whose licence has been cancelled) a certificate specifying the loan in respect of which a suit may be instituted by him or the decree in respect of which an application for execution may be presented. The Provincial Government has been given the power to exempt any person or class of persons from the operations of the Act. This Act does not affect the loans granted by a landlord to his tenant for purposes of husbandry and also those granted by Banks, Co-operative Credit Societies or the Central and Provincial Governments."

A change of opinion is also observable in other provinces. The United Provinces Government have told us—

" It is clear that they (village moneylenders) are an indispensable element in the financial system of the country though their resources are limited and methods antiquated. The true remedy, therefore, is not to end but to mend them. No statistical data are available regarding their business. The necessity of such data is urgent, and the same is needed with a view to determine the direction in which they should be improved. It is considered that it would be useful to proceed with the implementation of the United Provinces Money-lenders' Bill, 1939."

We agree that an important advantage of the licensing system would be that it would provide a machinery for ascertaining the real state of affairs regarding indebtedness and rural credit requirements, and other information necessary for devising methods of improving rural credit facilities.

In Bombay, we are informed, the promulgation of a Money-lenders' Act was considered on several occasions in the past, but for a variety of reasons was not proceeded with. It has recently been impressed on the Government by the Provincial Rural Development Board that it is necessary to have an Act of this nature, and the Government agree that " the primary needs are (i) to license money-lenders and limit their rates of interest and stop usurious practices; (ii) to curtail the cultivator's liberty to borrow and allow loans from licensed money-lenders mostly for productive purposes, a small margin being allowed for unproductive purposes; and (iii) by a system of control of crops and compulsory marketing through societies, to recover the loans promptly and save the cultivator from his own improvidence."

In the Central Provinces and Berar, a Money-lenders' Act has been in operation since 1934, and judicial administration reports show that the Act is working satisfactorily on the whole, although the courts have come across cases of unlicensed money-lenders and cases where accounts were not kept and supplied as required by the Act.

17. In the light of the experience in the Punjab and the Central Provinces, the action taken in Bengal and Sind, and the views expressed by the Governments of the United Provinces and Bombay, we feel no doubt about the correctness of the conclusions recorded at the end of paragraph 14 above. We, therefore, recommend the adoption of legislation, on the lines in force in the Punjab by all provinces which have not already undertaken such legislation. We desire to make it clear that this recommendation is based on recognition of the role that money-lenders have played and are likely to play in the future in rural economy and the consequent need for ensuring a high standard of efficiency, integrity, and fair dealing among borrowers as well as lenders. We would add that legislation by itself is not sufficient, and that emphasis must be laid on adequate and continuous supervision of the licensing system and the systematic review of results.

18. We think that, concurrently with the extension of the system of licensing of money-lenders, steps should be taken to improve their status and link them, together with indigenous bankers, to the banking structure of the country. A number of recommendations were made by the Central Banking Enquiry Committee in order to secure these objectives. We understand that efforts made in this direction by the Reserve Bank, in its Agricultural Credit Department, have encountered difficulties and made little progress. In view, however, of the obvious importance of the subject, we suggest, that the possibility of removing the difficulties hitherto encountered should be further explored by the Reserve Bank in consultation with Provincial Governments.

Measures for relief of debt

19. The Central Banking Enquiry Committee drew pointed attention to one very unsatisfactory feature of the system of agricultural finance, namely, the absence of a clear distinction between loans required for short and long periods. They said[1]—

"When large sums of money are borrowed, say, for capital improvements or for repayable debt, which could not in ordinary circumstances be repaid within a short period of time, the period of repayment fixed in the bond of agreement does not ordinarily exceed a short period, for instance, it is three years in the Central Provinces. The result is that the income of the cultivator has to be utilized towards payment of the loan to a greater extent than is possible or desirable and he is left without sufficient margin

[1] Report of the Central Banking Enquiry Committee, page 60, paragraph 85.

even for his subsistence. This involves running the farms on less productive methods than would otherwise be possible and its reactions on national welfare are detrimental."

Elsewhere in the report the Committee drew attention to another undesirable consequence of this defect, its effect on the capacity of the money-lender to provide an adequate supply of credit at a reasonable price. The Committee said[1]—

"The money-lenders generally work with their own capital . . . Owing to the absence of a rational system of rural finance differentiating between short and intermediate credit needs on the one hand and long-term needs on the other, the capital of the village money-lender who is the mainstay of the agriculturist is becoming frozen from year to year."

It is obvious that no change in this situation can be expected until the volume of indebtedness of the cultivating classes to money-lenders is reduced to what may be regarded as the normal requirements of short-term and intermediate-term credit, and does not include amounts which can only be repaid over a long series of years. The healthy functioning of the rural credit system is, therefore, bound up with the question of the reduction of indebtedness.

20. On this question the Central Banking Enquiry Committee made the following recommendation [2]:—

"(1) Attempts to relieve prior indebtedness may be usefully made in localities where co-operative land mortgage banks exist and the further establishment of these banks should be encouraged where there is reasonable prospect of their successful working having regard to all the local conditions.

(2) To satisfy the credit requirements of large classes of agriculturists who are outside the co-operative movement and to provide substantial loans to big landlords, Provincial Land Mortgage Corporations on a joint-stock basis or on the model of the English Land Mortgage Corporation are necessary.

(3) A scheme of debt conciliation on a voluntary basis is recommended for the consideration of local Governments.

(4) The Governments concerned should also explore the possibility and desirability of undertaking other legislation to secure the settlement of debts on a compulsory basis."

21. These recommendations were made against a background of growing economic depression, which presently compelled all Provincial Governments to adopt various legislative measures for the relief of debt. The nature of these measures are described below:—

(*a*) *Moratorium.*—Prior to the formulation of debt relief measures, many Provincial Governments granted a moratorium to agricultural debtors with a view to preventing a rush of suits and

[1] Report of the Central Banking Enquiry Committee, page 81, paragraph 113.

[2] *Ibid*, page 498.

the wholesale execution of decrees. To give such protection to the agriculturists, the Government of the United Provinces notified in 1932 that the execution of decrees involving sale of land should be transferred to the Collector, who was also authorized to adjourn all sales in case the price offered was unfair. This measure was subsequently reinforced by provisions enabling the debtor to secure a fair price for his land or to pay off the debt in instalments. In 1937, this was extended to small holders and tenants. Similar protection was given to the agriculturists in the Central Provinces, Madras and Bombay. In the remaining provinces, the Debt Relief Acts provided for the stay of proceedings in suits and decrees on the application by debtors for conciliation of debts and this indirectly granted a moratorium in respect of their loans until decisions were taken by the Debt Settlement Boards.

(*b*) *Conciliation of debts.*—Before resorting to compulsion for scaling down debts some provinces considered it proper to reduce them by bringing about an amicable settlement between debtors and creditors. Debt Conciliation Acts were thus passed in the Central Provinces (1933), Bengal and Madras (1936), the Punjab (1934), and in some of the Indian States. Under these Acts, Conciliation Boards were established for the purpose of effecting an amicable reduction in debts and arranging for their repayment in instalments.

(*c*) *Compulsory reduction of debt.*—In order to give further relief to debtors, Debt Relief Acts were passed in Madras (1938), the Central Provinces and Berar (1939), the United Provinces (1939), Bombay (1939), and Sind (1940). Generally, the main objects of these Acts were—

(i) to reduce the outstanding debts so as not to exceed twice the original principal, less all payments received by the creditor in the past;

(ii) the reduction of arrears of interest on debts incurred during the depression period; and

(iii) to fix the rate of interest for subsequent years.

Decrease in indebtedness between 1942 *and* 1945

22. The severe effects of the fall of agricultural prices in increasing the burden of agricultural debt continued to be felt and debt relief machinery continued to operate until some time after the outbreak of war. Within the last three years, however, there has been a welcome change. In view of the absence of reliable statistics, it is impossible to estimate the extent of the reduction in agricultural indebtedness as a result of high prices for agricultural produce. The replies[1] which we have received indicate, however, that there has been a substantial reduction in all provinces. This appears to be particularly true of cultivators with large holdings and a considerable proportion of those possessing medium holdings. The hopeful significance of this fact for

[1] Appendix III.

the future development of agriculture should not be under-estimated, merely because the proportion of such classes to the total rural population is not large. It should not be overlooked that the proportion of land held by these classes is large. In so far as the burden of debt has hitherto stood in the way of the improvement and better cultivation of land, the outlook for the future may be regarded as reasonably bright in respect of the greater part of the cultivated land of the country.

23. Judging from the replies received from a number of provinces, it appears probable that small holders, as a class, have not benefited materially. It is true that the market value of their holdings has risen greatly. Those who supplement their income by other forms of labour have also been helped by the prevailing high level of employment and wages. Again, in some parts of the country, family allotments by soldiers have added to income. Against these circumstances must be set, however, the important fact that the amount of produce normally sold by small holders for payment of revenue, rent, and repayment of debt is relatively small, and there has been a substantial rise in prices of consumer goods usually purchased by them. It, therefore, appears probable that the indebtedness of this class, speaking generally, may not have been reduced substantially in many parts of the country.

Land mortgage banks

24. It is only in the province of Madras that the technique of land mortgage banking has been developed to any material extent. The Madras Central Land Mortgage Bank was established in 1929 and by the close of the year 1941–42, the number of primary banks had increased from 12 to 119. The figures of the debentures floated and the loans advanced by the Central Bank also indicate the progress made. Up to the 30th June 1942 debentures had been issued to the extent of Rs. 3·60 crores, of which Rs. 2·74 crores were outstanding on that date. The amount of loans due by the primary banks to the Central Bank on the same date was Rs. 2·59 crores, of which it is satisfactory to note, no portion was overdue.

A Central Land Mortgage Bank, on the lines of that in Madras, was organized in Bombay in 1935, and by the end of June 1942, 17 primary banks had been established. The debentures outstanding on the 30th June 1942 amounted to Rs. 30 lakhs against loans due from primary banks of Rs. 31 lakhs, of which Rs. 29,000 were overdue for repayment.

In other provinces, with the exception of the Central Provinces and Berar, where there were, at the close of the year 1941–42, 21 societies with a membership of 6,800, practically no progress has been made.

Concluding remarks

25. In the light of present conditions we have reviewed the recommendations of the Central Banking Enquiry Committee set out in paragraph 20 above and our conclusions are as follows:—

(i) It is possible that the measures taken for the scaling down of debts, whether through debt conciliation boards or compulsorily, have largely served their purpose. Such measures are

not normally conducive to a healthy relationship between debtor and creditor, on which the improvement of rural credit facilities, in the last resort, depends. It is no longer necessary, nor in the public interest, that the expedient of the compulsory scaling down of debt should be repeated. The lesson to be drawn from the debt relief legislation in the past decade, therefore, is that the conditions which made it inevitable should not be permitted to arise again. Hence the importance of ensuring a stable price level for agricultural produce, a subject on which we have already expressed our views in the preceding section.

(ii) We think that the nature of the long-term credit requirements of the larger landholders (cultivators) will change. There should be little need in the post-war period for the grant of loans to such landholders for the repayment of old debts; on the other hand their need for long-term credit for land improvement should increase. The need for reducing the debts of some of the cultivators with medium holdings and of the majority of the small cultivators will remain. For the provision of long-term credit for land improvement and the repayment of past debts by solvent medium and small holders, we consider that an effort should be made to develop land mortgage banks on a much wider scale than hitherto in all provinces. In the past the business of land mortgage banks has been almost entirely limited to loans for the redemption of old debts. We strongly recommend that their activities should be extended to the provision of credit for the improvement of land and the introduction of better methods of cultivation.

(iii) Finally, we attach great importance to the cultivation of the saving habit and the avoidance of excessive expenditure on ceremonial functions, on litigation and the like. The experience of the decade following the last war, when there was a general rise in unproductive expenditure, provides a warning which should not be ignored. The ground won during recent years by landholders generally, and more particularly by the larger landholders, would be lost if, as consumer goods become more plentiful and cheaper, habits of extravagance and wasteful expenditure should grow. Again, debt is frequently due to extravagant expenditure, often incurred unwillingly owing to pressure of social customs. We, therefore, recommend—

(*a*) The savings campaign undertaken during the war should be continued and intensified during the immediate post-war period. Propaganda should be undertaken in the rural areas, linking the need for savings with the requirements of schemes of rural economic development.

(*b*) Educative propaganda should be undertaken, and where necessary and feasible legislation[1] also, in order to check those customs which compel individuals to incur expenditure beyond their means.

[1]Our attention has been drawn to the Caste Tyranny Act, 1933, in force in the State of Baroda as an example of such legislation.

Summary of conclusions and recommendations

26. Our main conclusions and recommendations are—

(i) We consider it necessary (a) that money-lenders should be licensed, (b) that the reciprocal obligations of the lender and the borrower should be regulated by law in such matters as the interest chargeable for different types of transactions, the maintenance of proper accounts, the periodical settlement of accounts, etc., and (c) that adequate machinery should be established for administering the licensing system and reviewing the effect of regulation, with a view to continuous improvement of rural credit facilities.

(ii) In order to secure the foregoing, we recommend the adoption of legislation, on the lines in force in the Punjab, by all provinces which have not already undertaken such legislation.

(iii) Efforts to link money-lenders and indigenous bankers with the banking structure of the country have made little progress. The possibilities of removing the difficulties hitherto encountered should be further explored by the Reserve Bank in consultation with Provincial Governments.

(iv) As a result of high prices of agricultural produce, there has been a substantial reduction in agricultural indebtedness. This appears to be particularly true of cultivators with large holdings and a considerable proportion of those possessing medium holdings. It appears probable, however, that the indebtedness of small holders may not have been reduced substantially in many parts of the country.

(v) It is no longer necessary, nor in the public interest, that the expedient of the compulsory scaling down of debt should be repeated. The lesson to be drawn from debt relief legislation undertaken in the past decade is that the conditions which made it inevitable, should not be permitted to arise again, that is, a stable price level for agricultural produce should be ensured.

(vi) Land mortgage banks should be developed in all provinces with the object of providing long-term credit, not only for the redemption of old debts but also for land improvement and the introduction of better methods of cultivation.

(vii) The savings campaign undertaken during the war should be continued and intensified during the immediate post-war period.

(viii) Educative propaganda should be undertaken, and where necessary and feasible legislation also, in order to check social customs, which compel individuals to incur expenditure beyond their means.

C.—Rural Employment—Under-employment

27. Perhaps the most important, and in many ways the most intractable, of all rural economic problems is that of under-employment. One of its aspects is the need for supplemental

employment for agriculturists. Another is the need for increasing the numbers employed in non-agricultural occupations so that pressure of agricultural population on the land may be relieved.

28. On the question of the need for supplemental employment for agriculturists the Royal Commission on Agriculture commented as follows [1]:—

"A prominent feature of Indian agriculture is the amount of spare time which it leaves for the cultivator. This varies very greatly according to the local agricultural conditions, but it may be assumed as a broad generalization that by far the greater part of cultivators have at least from two to four months of absolute leisure in the year . . . As agriculture in the greater part of India cannot offer employment for the whole of the year, the problem is to suggest lines of work which can suitably be undertaken by the cultivator or his family in their spare time and without detriment to the cultivation of their land."

The seasonal character of agricultural employment is a serious matter for two reasons, both related to rural overpopulation. First a large number of farms are uneconomic, that is, the farmer is compelled to seek other employment in order to support himself and his family, and secondly, the supply of agricultural labour in many parts of the country is in excess of the demand.

29. We put the following question to Provincial Governments:—

It is generally believed that even in normal times a section of the population is too poor to secure a sufficiency of foodgrains and is, therefore, underfed at least during certain parts of the year. Is this true of your province? If so, can you make a rough estimate of the numbers involved and the average period in a normal year during which they are underfed?

The gist of the replies we received was as follows: It was reported from Sind and the Punjab that the statement was not true of those provinces; no section of the population was too poor to secure a sufficiency of foodgrains in any part of the year, though ill-balanced diets were common. The Central Provinces and Berar, the North-West Frontier Province and Assam formed another group; the trend of their replies was that, apart from some local exceptions (e.g., Sylhet in Assam and certain remote aboriginal tracts in the Central Provinces), the existence of poverty so extreme as to entail insufficiency of staple foodgrains was doubted or denied. In all other provinces the question was answered in the affirmative, though information as to the numbers involved was not available. In general, the rural population affected consists of landless labourers and those with very small holdings. We observe that the differences in the replies reflect fairly closely the differences in the pressure of population on land.

[1] Report of the Royal Commission on Agriculture, page 566, paragraph 488.

30. It is unnecessary for us to dwell on the gravity of this problem which is sufficiently well realized. We consider that its solution is not to be found in any one single measure but in a combination of the following, viz., (i) intensive farming; (ii) cottage industry; (iii) agro-industry; (iv) village public works; (v) internal migration and (vi) large scale industry. We shall give briefly our views under each of these heads.

Intensive farming

31. In earlier chapters we have described the various means by which the yield per acre of cultivated land can be increased. By " intensive farming " we mean the adoption of all those means of increasing yields; we also include mixed farming under this head. If two or more crops are grown on land which at present is cropped only once, it is obvious that employment will be substantially increased. To a large extent, though not entirely, this is a question of the better conservation and use of available water—the development of irrigation in the wide sense in which we have used the term. Similarly, the cultivation of an irrigated crop where an unirrigated crop is grown at present, the more extended use of manure, greater care in the preparation of the soil, the control of pests and diseases, and all the other processes necessary for the more efficient cultivation of the land would have the same effect. They would all involve an increase in agricultural employment and thereby reduce the need for supplemental employment. A similar result would also be obtained from an extension of the practice of mixed farming, which involves greater attention to livestock.

Cottage industries

32. The Royal Commission on Agriculture, while pointing out that " the contribution which rural industries can make, is infinitesimal and in the nature of things they cannot, as a rule, hope for ever to survive the increasing competition of organized industry,"[1] expressed the view that the development of these industries should be encouraged by (i) the development of new ideas, such as the supply of attractive patterns; (ii) careful and thorough instruction in modern processes; and (iii) finding markets in and outside the locality. They further suggested that these forms of assistance could best be given by the Co-operative and Industries departments to artisans organized on the co-operative basis. The Central Banking Enquiry Committee also laid stress on the need for the encouragement of cottage industries by Government and remarked:[2] " There is little doubt that one of the main reasons for the decline of some of the cottage industries is the lack of interest taken by Government in the past, at any rate up to 1921, in the fostering and development of these industries. . . After 1921, some progress has been made in several

[1] Report of the Royal Commission on Agriculture, page 575

[2] Report of the Central Banking Enquiry Committee, page 248, paragrapph 301

of the provinces in the direction of development of these industries, but it will take some time to make up the leeway arising out of the policy of inaction in previous years." This Committee also held that the development of cottage industries was not merely a matter of helping the non-agricultural population to increase its income from industrial employment, but that it was also capable of providing the cultivator with a suitable subsidiary occupation for his spare time.

33. We put the following question to the Provincial Governments:—

What are the industries subsidiary to agriculture in your province? Describe the efforts made by Government or other agencies to develop such industries during the twenty years ending 1941–42. Assess the results of such efforts from the point of view of provision of supplemental income to small cultivators and reduction of the numbers of those people too poor to secure a sufficiency of foodgrains and therefore underfed at least during certain parts of the year. What would you recommend as the most promising measures from this point of view?

The replies received from provinces are annexed to this report.[1] On a review of these replies the following conclusions emerge:—

(i) The most important cottage industry is handloom weaving and during the last two decades considerable efforts have been made, both by official and non-official agencies, to improve and extend this industry. These have been attended with some success though figures are not available by which this conclusion can be tested. It is necessary that the methods by which this industry is at present assisted should be continued and further extended in the future.

(ii) There is scope for development of cottage industries in many other directions. The possibilities have not yet been systematically surveyed in some parts of the country and where they have been, the efforts made so far have not yielded any striking results.

34. There is no lack of knowledge as to the forms of assistance necessary for the development of these industries. Nor is there lack of willingness to help. One difficulty appears to be that of finding a suitable agency through which State assistance can be made available to the small cultivator as well as to the rural artisan. In certain sections of the handloom industry, the co-operative movement has been able to provide such an agency. It is one thing, however, to organize into a co-operative society artisans whose principal source of livelihood is a particular industry and who are often congregated in small communities. Quite a different problem of organization is presented where the development of supplemental occupation for agriculturists is involved. This problem, as far as we can see, has not yet been

[1] Appendix V.

solved. We doubt whether the co-operative movement can help until the multi-purpose society is developed to a much greater extent than it is at present. The agriculturist, particularly the small holder, needs the benefit of co-operation for securing a better income from his principal source of livelihood, viz., cultivation. If societies are formed which undertake this task and perform it with success, they would gain experience in the co-operative sale of farm produce and purchase of manure, seed and other farm requirements. Such societies could undertake the development of cottage industries among their members and help in the purchase of raw materials and disposal of the manufactured products. In other words, it seems to us probable that subsidiary employment for the cultivator and his family can be organized co-operatively, only if such organization is regarded as a subsidiary function of a co-operative society, whose main function is to assist the cultivator in the production and marketing of agricultural produce.

Mention should be made of " rural reconstruction centres " which have been developed by missionary organizations and such bodies as the All-India Village Industries Association. These have among their objectives the development of new rural industries and the improvement of existing industries; they arrange for the distribution of raw materials for handicrafts and seek to improve the marketing of the products. Rural reconstruction centres and agencies of this type are as yet few in number, but some have achieved considerable success, and their method of approach to rural problems deserves to be more widely known. Much can be accomplished in a limited area by an energetic and inspiring rural reconstruction worker, or group of workers, particularly if sufficient funds are available to facilitate the initiation and development of the work. There is always the danger, however, that on the departure of those who produce the necessary " driving force " and the withdrawal of funds the ground which has been gained will be lost. Further the methods followed in individual centres are not always such that their reproduction on a wider scale is a feasible proposition. We feel that the extension of rural reconstruction centres and agencies is to be encouraged, but at the same time the whole question of how they can most efficiently contribute to rural development generally needs more careful attention and study than it has yet received.

We shall refer again in the next chapter to the need for developing multi-purpose co-operative societies. This, however, will take time and meanwhile we suggest an endeavour should be made to work through selected private agencies. It is true that the middleman, whether a trader or a money-lender, frequently exploits the cottage worker by overcharging him for raw materials and underpaying him for the finished article. But we believe that some middlemen would be prepared to co-operate with Government in arranging for adequate supplies of raw materials at reasonable prices and in marketing on reasonable terms the finshed products. We accordingly recommend that the Government

departments concerned through their local officers should maintain contact with the local dealers, and obtain, as far as possible, their co-operation in the development of cottage industries.

Agro-industry

35. By " agro-industry " we mean the type of industrial undertaking—not cottage industry—which is specially suitable for development in rural areas. We may illustrate the type we have in mind by a description of the results achieved on an estate [1] in the Bombay Presidency. The estate, which covers about 45 square miles, was formed about 12 years ago by the acquisition or lease of land from numerous small holders and has been developed primarily as a sugar farm. Large areas of salt-affected waste land have been reclaimed; irrigation has been extended; and between 1933–34 and 1942–43, the total area under cultivation increased from 1,400 to 5,600 acres. The area grown with sugarcane has, during the same period, increased from about 1,000 to 3,500 acres and the yield has gone up from 35 tons to about 53 tons per acre, an increase of 50 per cent. The area under food crops has also increased and recently the cultivation of vegetables on a considerable scale has been developed. Further, a dairy has been started and a pasteurization plant installed. To deal with the sugarcane grown on the estate, a sugar factory has been established, which is now capable of dealing with 1,200 tons of cane per day. The increasing area of land under sugarcane required increasingly large quantities of organic manure. In order to meet this demand, an oil mill has been established and the groundnut cake produced by the mill is used on the farm. The groundnut oil extracted in the process had to be marketed satisfactorily. This led to the installation of an oil refinery and an oil hydrogenation plant for treating the raw oil of the mill. This, in turn, led to further developments, such as the manufacture of various types of soap from the waste products of the refinery. The development of the sugar factory likewise led to the establishment of a distillery for the manufacture of rectified spirit from molasses and also for the recovery of yeast. Developments to the mutual benefit of the factory and the farm are not yet exhausted; research and experiments are still proceeding into the best ways of utilizing the products of the factory and the farm and avoiding waste. We understand that the volume of employment has increased, that better wages are being paid than in similar employment in the neighbourhood, and that, in particular, new avenues of employment have been developed for skilled personnel. Housing is provided for a large part of the staff and the amenities provided include free medical and education facilities.

36. We have described the working of this estate at some length, mainly because it brings out prominently the essential elements in a programme of combined development of agriculture and rural industry to which we attach considerable importance. Where the

[1] Walchandnagar—We visited this estate in the course of our tours.

factory is located close to the farm and both are managed in organic relation to one another, it is clear that the development of the factory helps the development of the farm and *vice versa*. These are the conditions necessary for enabling the rural population to secure fuller employment and a higher standard of living. We are, of course, far from suggesting that it will be possible for every large farm to establish a factory. There are few holdings as large as the estate we have described and few owners command the resources of capital and organization which have made possible the development of this estate. The general lesson we would draw from this instance of the combined development of agriculture and industry, is the benefits which would accrue from the establishment in rural areas of factories for the processing of farm products and working in association with large holders of land and co-operative societies representative of small holders.

37. In the particular instance we have described, sugarcane was the basis of the development. In spite of the large expansion which has already taken place in the sugar industry in the country, there is doubtless still considerable scope for the development of agro-industry based on sugarcane. Sugarcane is not, of course, the only farm product on which industrial development may be based. Others are indicated in the replies from Provincial Governments annexed to this report. We quote below a passage from one of these replies:—

"It would be unwise, however, to restrict the scope of the term 'industries subsidiary to agriculture' to cottage industries or to those industries which give subsidiary employment to the agriculturist. It is considered that it is desirable to divide the province into 'economic units,' the smallest of which might be in type squares with sides 15 miles long and to plan the agricological and industrial development of each unit.

In a unit where the agriculture was mainly groundnut and cotton, the industries for development would be oilseed crushing cotton ginning, handloom or power spinning and weaving.

In a unit which had special possibilities for dairying, a central dairy with a co-operative milk society should be established.

For a number of oilseed units, a vegetable *ghee* hydrogenation plant might be established and for a number of dairying units a dried milk factory. It is desirable that there should be balance of agriculture and industry not only for the country as a whole but for each area in it."

Other instances can be mentioned, as, for instance, industry based on fruits and vegetables, tobacco, coir, hides, skins, etc.

38. We invite particular attention to the possibilities of agro-industry based on oilseeds and the urgent need for its development. Elsewhere in this report we have emphasized the

importance of securing as early as possible a large increase in the quantity of oilcake produced in the country. This is required both for use as manure and as cattle feed. At the same time, there is need for a larger supply of vegetable oils for human consumption. We are of opinion that the country requires a considerable extension in the cultivation of oilseeds and the development of a widely dispersed agro-industry based on these seeds. Such a combined development would result in an increase in the productivity of the land, an improvement in the supply of cattle feed and oils for human consumption and an expansion in the volume of non-agricultural employment in rural areas.

39. We have not been able to devote consideration to the problems of organization and finance involved in the development of agro-industry. We note that it has been publicly announced that the planned development of industry is the accepted policy of Government and we have no doubt that these problems are being studied. We desire only to emphasize our view that agro-industry can play an important role in the field of rural economy. Investigations into the processing of farm products, the planning of the location of factories and the provision of facilities for their orderly and efficient development including, in particular, the supply of cheap hydro-electric power are tasks demanding the earnest attention of the Central and Provincial Governments in the immediate post-war period. It is clear that hydro-electric development is an important factor in the decentralization of industry generally and its spread in small towns and rural areas.

Village public works.

40. We have described so far the methods by which the volume of private employment available in rural areas can be increased. We believe that village works of improvement can also make a contribution to the relief of under-employment. We are, of course, aware that every year public works of one kind or another are undertaken by Provincial Governments and local authorities, and that many of these are carried out in rural areas, thereby providing employment for the villagers. Roads are built and maintained, public buildings of various kinds erected and repaired, and irrigation works constructed and maintained. Works of this kind will continue and the schemes of post-war development now being framed, will, no doubt, result in an increase in the number of such works and additional employment in rural areas. When we speak of "village public works," however, we have in mind those small works which, although they add greatly to the amenities of village life, are not normally undertaken and maintained directly by Government or District and Local Boards. There is a limit to the type and size of the works which can be carried out by an agency operating from outside the village. In nearly every village there are small works which need to be done in the interest of the village as a whole, but which at present are

not attended to at all or are not carried out satisfactorily. Instances of such works are, first, village roads, particularly those connecting villages with the main roads—these are frequently in a very primitive condition, secondly, wells and tanks for the supply of drinking water, and thirdly drainage and jungle clearing.

41. The conditions necessary for the successful organization of village public works are—

(i) The establishment of a *panchayat* for a village or group of villages with power to raise money by taxation for village improvements;

(ii) a system of grants-in-aid towards the cost of such improvements; and

(iii) the execution of such improvements by the *panchayat* subject to supervision by Government, District Board or Local Board officials.

We shall refer again to the need for the establishment of *panchayats*. We consider them indispensable for the development of rural areas. But if, for any reason, *panchayats* cannot be established as permanent civic institutions, we suggest the constitution of *ad hoc* committees for the purpose of undertaking village public works.

We attach importance to a proportion of the cost of village works being met by grants-in-aid, for such grants will encourage villagers to tax themselves or raise money by voluntary subscriptions for carrying out new and maintaining old works. In the absence of such encouragement there is the danger that nothing will be done. The grants should not bear a fixed proportion to the cost of the work or works but should vary in accordance with the financial condition of the village or group of villages as the case may be.

The works should be carried out as far as possible, in the season when agricultural operations are not in progress, for it should be recognized that the works are intended not only for improving the amenities of the village but also for providing employment to those in the village who are under-employed.

42. It has been suggested that the principle underlying the grant of relief during periods of scarcity and famine should be extended, and that Government should undertake the obligation to provide food or purchasing power to all persons who are unable to obtain food and who, if able-bodied, are willing to work. We put this suggestion to Provincial Governments and their replies are appended to this report.[1] The general tenor of the replies, with which we agree, is that the suggestion is not practicable. We also agree that any measures calculated to discourage self-help and thrift or to produce pauperization should be avoided. The proposal that the execution of village works can make a contribution to the solution of the problem of under-employment in the village, is we consider, free from these objections.

[1] Appendix V.

Internal migration.

43. We have not been able to consider the problems involved in internal migration from over-populated to under-populated rural areas, and must content ourselves with drawing attention to this matter.

Data about internal migration are not included in the 1941 census report, but previous reports show that during the first 30 years of the century, immigration into the provinces of Assam, Bengal and Bombay exceeded emigration, while the reverse was the case in the United Provinces, Madras, Bihar and Orissa. The largest gains from this source were in Assam and were due partly to the recruitment of labour for tea gardens and partly to the influx of agriculturists from East Bengal. The volume of internal migration was, however, small and, except in Assam, had little effect on the trend of population growth in the provinces concerned.

It is expected that during the post-war period considerable areas of new land will be brought under cultivation by the efforts of the State. In certain provinces large scale irrigation works are projected and these will bring new tracts under the plough. In parts of the country extensive areas are thinly populated and under-developed because of malaria. Efficient anti-malaria measures can render them suitable for cultivation. In other parts new land can be brought under cultivation by means of tractor ploughing. The opening up of these lands will afford opportunities for the transfer of agriculturists from densely populated areas to these new areas; this is a matter to which, we consider, Governments should direct their attention with a view to preparing schemes of colonization. In paragraph 22 of Chapter I of Part II, we have suggested that under-developed countries in the Commonwealth and Empire should be open to colonization by Indians; equally within India itself provinces and states in which there are areas suitable for colonization, should be ready to accept immigrants from other parts of the country where there is greater pressure of population on land.

Large scale industry

44. We have described the methods by which fuller employment may be provided in rural areas. But pressure of population on land, especially in those parts of the country where it is very pronounced, cannot be relieved entirely by intensive farming, cottage industries, agro-industries, village public works and internal migration. In paragraph 20 of Chapter III of Part II of this report, we stressed the need for industrial developments. We return to this subject once more, for, we are convinced that unless the numbers employed in industry are increased very considerably, efforts to raise the standard of living of the great mass of the population will labour under a severe handicap and may prove fruitless. It is essential that a proper balance between agriculture and industry should be established; this cannot be achieved except by industrial expansion.

Summary of conclusions and recommendations

45. (i) Perhaps the most important of all rural economic problems is under-employment. Its solution is to be found in a combination of the following measures:—(*a*) intensive farming, (*b*) cottage industry, (*c*) agro-industry, (*d*) village public works, (*e*) internal migration and (*f*) large scale industry.

(ii) Intensive farming involves the adoption of various measures for increasing yields, such as irrigation, manuring, the use of improved seed, etc. It also includes the practice of mixed farming.

(iii) The most important cottage industry is handloom weaving. Efforts made to extend and improve this industry have been attended with some success; they should be continued and extended. There is scope for the development of many other cottage industries; the efforts so far made have not, however, produced any striking results.

(iv) The organization of co-operative societies for the development of cottage industries presents more difficulty in the case of agriculturists than of artisans. It appears probable that subsidiary employment for agriculturists can be organized co-operatively only if such organization is regarded as a subsidiary function of multi-purpose co-operative societies, the main function of which would be to assist the cultivator in the production and marketing of agricultural produce. Until such multi-purpose societies are formed it is suggested that every endeavour should be made to utilize the services of those local dealers who are willing to co-operate with Government in the development of cottage industries.

(v) Attention is drawn to the success achieved in some areas by "rural reconstruction centres" developed by missionary organizations and such bodies as the All-India Village Industries Association. The question of how such centres can most efficiently contribute to rural development needs more careful attention and study than it has yet received.

(vi) By 'agro-industry' is meant the type of industrial undertaking, not a cottage industry, which is specially suitable for development in rural areas. Emphasis is laid on the benefits which would accrue from the establishment in such areas of factories for the processing of farm products and working in association with large holders of land and co-operative societies representative of small holders. Attention is drawn to the success achieved in this direction on a large estate in the Bombay Presidency.

(vii) Village works of improvement can also make a contribution to the relief of under-employment by providing work in the season when agricultural operations are not in progress. The conditions necessary for the successful organization of village public works are first, the establishment of a *panchayat* for each village or group of villages with powers to raise money by taxation; secondly, a system of grants-in-aid from public revenues towards

the cost of village improvements; and thirdly, the execution of such improvements by the *panchayats* subject to supervision by Government, District Board or Local Board officials.

(viii) Attention is drawn to the problems involved in internal migration from over-populated to under-populated rural areas. During the post-war period considerable areas of new land will be brought under cultivation by the efforts of the State and it is suggested that Governments should direct their attention to preparing schemes for the colonization of these areas. Provinces and states in which there are areas suitable for colonization, should be ready to accept immigrants from the densely populated parts of the country.

(ix) The pressure of population on land cannot be relieved entirely by intensive farming, cottage industry, agro-industry, village public works, and internal migration. The view is expressed that unless the numbers employed in industry are increased very considerably, efforts to raise the standard of living of the great mass of the population will labour under a severe handicap and may prove fruitless. Special attention is drawn to the development of hydro-electric power as an important factor in industrial development.

CHAPTER III.—RURAL DEVELOPMENT ORGANIZATIONS

A.—Preliminary

We have referred more than once in this report to the note prepared by Dr. Burns on the " Technological Possibilities of Agricultural Development in India ". At the end of that note a very important question, viz., the type of agricultural organization most suitable for realizing the technological possibilities described in the note, is raised in the following terms:—

> Everything points to some type of collective organization. . . . In any planning of agriculture for the future, one inevitably turns to the great Soviet experiment. While keeping an absolutely open mind as regards that experiment, I would quote in conclusion a remark by the late Sir Daniel Hall, one of the most level-headed of British agricultural scientists: ' What is, however, worthy of consideration is the fact that the men who planned the Soviet organization, men lacking neither in knowledge of the material world nor a perception of affairs, did deliberately abandon the peasant structure of agriculture to which they had been habituated, and have attempted to replace it by large-scale exploitation of the land, using all the resources of science and machinery. The motive was to obtain increased production, more food for a vast population that was insufficiently fed and liable to famine, and yet at the same time to liberate more labour for the other industries, whereby the total divisible wealth of the population would be increased.'

On this problem of organization we put the following questions to Provincial Governments:—

(i) The view has been often expressed that individual holders of land cannot achieve any material increase in production or improvement of their standard of life unless they are organized for the purpose, e.g., on some kind of collective basis. Do you agree with this view?

(ii) Describe the extent to which co-operative societies, *panchayats*, or other organizations are at present functioning in rural areas of your Province. Assess their adequacy or usefulness for the purpose stated above.

(iii) If you consider them inadequate or inefficient, can you outline practical methods of constituting some form of village organization which would efficiently secure the purpose in view?

An abstract of the replies received is appended to this report.[1]

2. Our first question was intended to be general, though some have interpreted it as a specific enquiry about collective farms. The replies indicate first, a consensus of opinion on the need for an advance from the present unorganized condition of agriculture; secondly, a general belief that, while the line of advance must be through a great extension of co-operation, the present forms of

[1] Appendix VI.

co-operative organization do not fulfil the purpose in view and that the best methods of applying the principles of co-operation to the problems of the small farmer still remain to be worked out.

3. It will be observed from the abstract of the replies appended to this report that references are made to " collective farming ", " joint farming " and " co-operative farming ", sometimes in different senses and sometimes as though the terms were synonymous. It is desirable that the various types of organization should be distinguished by different names. The term " collective farming " has come into use in relation to the type of farming which has developed in Russia and should, in our view, be reserved for that type. So far as we understand, the members of a collective farm possess no right of ownership in the land of the farm, they are co-workers in the enterprise, paid according to labour-time contributed by them, and collectively undertake its management subject to certain obligations to the State.

The expression " joint farming " is a convenient term for describing a type of farming which has been suggested by certain economists of Madras. Their views have been quoted by the Government of Madras in the following terms:—

> Nor is consolidation likely to be of much avail when the size of most of the holdings is far too small. A more rational though difficult line of experiment would be to organize co-operative or joint farming on a scale which would permit the use of improved implements and methods. The existing holders of fragments should be induced to merge their plots in the enterprise tentatively and, if success is assured, permanently in return for proportionate share in the enterprise. They can work on the co-operative farm as wage-earners.

The suggestion here is that individual rights in land should not be abolished but converted into shares in a joint enterprise. In this way, the collective farm idea would be adapted to Indian conditions and the elements of expropriation and social conflict which marked the establishment of collective farms in Russia avoided. We think it desirable that the term " joint farming " should be reserved for this type of organization.

A third type may be described as " co-operative farming ". This type has been referred to by the Government of Bombay when considering a proposal that an experiment in collective farming should be undertaken in that province. They observe as follows:

> A suggestion has been made to Government that an experiment in collectivized agriculture on the lines of the Russian practice should be undertaken in a group of 15 to 30 villages with an area of about 30,000 acres. But public opinion is not ready for so revolutionary a change in agricultural economy, and prefers that experiments may be tried in co-operative farming with a view to eliminate the middleman, market the produce on a co-operative basis, cultivate crops according to a pre-arranged plan and secure finance at cheap rates through co-operative agencies. Government is considering to what extent this suggestion can find a place in the post-war plan.

We consider that the expression " co-operative farming " should be reserved for the type of organization described by the Bombay Government, that is, farming by individuals who retain unchanged their rights in land but are united in a co-operative organization, designed to afford its members assistance and facilities for improving production, for the sale of their produce on the most favourable terms and for obtaining credit at reasonable rates.

4. We think the suggestion made about joint farming is interesting. As a type of organization to be developed on a large scale we do not consider it to be immediately practicable, nor are we convinced that it would always and everywhere promote increased production, for instance, in the cultivation of rice and garden lands. We hold that the immediate task is to concentrate on the promotion of co-operative farming in the sense we have defined the term.

B.—Multi-purpose Co-operation

5. The passage quoted from the reply of the Bombay Government clearly indicates the multi-purpose character of " co-operative farming ". We quote below a passage from the reply received from the Bengal Government which brings out even more fully the variety of purpose, in addition to the provision of short-term and long-term credit, for which co-operative farming organizations are necessary:—

"Increase in production can be achieved by (1) the use of improved seeds, (2) the use of scientific manure and fertilizers, (3) the use of improved agricultural implements, (4) providing irrigation or drainage facilities where necessary, (5) providing embankment for protection of land where necessary, (6) consolidation of the existing small and scattered holdings.

(4) and (5) are almost always possible through joint efforts. (6) would invariably call for combined efforts. (1), (2) and (3) can be made available at a reasonable cost only by joint purchase.

An ordinary holder of land does not get the adequate return for his produce. He is often compelled to dispose of his crop immediately after harvest at a low price to meet his immediate pressing needs. He has no holding capacity and commands only the harvest price. This drawback can be removed and a better price can be ensured to him by setting up a marketing organization through which he will sell his marketable produce and which will make an advance to him against the crop delivered to help him in meeting his present requirements. The organization will hold the stock and try to sell the same at the best possible market, the benefit of which will go to the producer.

Some sort of cottage industry may be introduced in the family of an agriculturist to keep the adults engaged during the off-season and also to afford a share to the womenfolk to contribute to the joint income . . . The raw materials can be provided at an advantageous price through collective purchase. Similarly, the finished products can be sold at an advantageous price in a suitable market through joint sale."

In other words, co-operation should cover the whole field of farm economy. The provision of relatively cheap credit is not enough; in fact, cheap credit by itself may do harm. A co-operative society of which a small cultivator is a member, should be able to assist him in many ways in his farming business.

6. The question arises whether it is possible to organize the small and medium farmer in a co-operative society which is capable of serving such a variety of purposes. One view, until recently the generally accepted view among co-operators, is that it is not. In this view it is necessary to organize special types of co-operative activity through special types of societies constituted for the purpose. The Royal Commission on Agriculture endorsed this conclusion. They held that co-operative societies with a single purpose are to be preferred to multi-purpose societies. Their views on this subject are given below.[1]

The credit society has proved easy to manage; its principles are readily understood; its requirements are within the capacity of the villagers to provide and it has done much to inculcate the value of self-help and of mutual help. A successful credit society is the best basis on which to organize other types, but it is not easy to educate the people to the advantages of these types. Debt is felt as a burden but there is not the same ready appreciation of the value of joint purchase and sale, of insurance or of the many other schemes with which experiments have been made. Where business activities are involved, business management is required and it is not easy to find the capacity for this from amongst the members of societies. Such talent in this direction as exists usually prefers to find scope in working for private gain and several promising societies have come to grief owing to the secession of an important office-holder who, seeing the possibilities of profit, decides to put his own interests first and to start a rival business. Lack of training in such matters as the combined purchase of agricultural requirements and the sale of produce has limited the choice of members of committees, and, where the men most fitted to serve in this capacity in credit and non-credit societies are the same, the question arises whether the same society would serve more than one purpose or whether there should be separate organizations for separate objects. No hard and fast rule or practice in this respect has yet been established in any province. Where the secondary object is of minor importance, such as the distribution of seed once or twice a year, or where the work involved is too slight to justify the establishment of a separate society, the credit society has usually undertaken the additional duty. But if the new object is of such a different character that it appeals to a different membership, separate societies are usually formed. The fact that, under the law, rural credit societies must have unlimited liability is recognized as an impediment to their undertaking business for which limited liability is more suitable, and where societies with unlimited liability are undertaking other functions, it is usual to keep separate accounts for the latter. We found that, on the whole, the single purpose idea met with general acceptance, and that, where exceptions occurred, these were based on reasonable grounds. The multiple purpose society is nowhere advocated on grounds of policy; it is usual to describe the objects of a society as to permit of secondary

[1]Report of the Royal Commission on Agriculture, page 467.

functions being performed without a breach of the law, but this is for convenience only and has not led to societies attempting to combine incompatible activities or risking their unlimited liability in transactions for which it is entirely unsuitable.

Broadly summarized, the practical objections to the multi-purpose society are twofold: first, the society will require continuous and competent guidance and supervision to an extent which is unlikely to be forthcoming; and, secondly, that while there are certain purposes for which it is essential that a society should be constituted on the basis of unlimited liability, there are certain other purposes for which unlimited liability is undesirable, and these cannot be satisfactorily combined. Are these objections conclusive? If they are, we fear that the contribution which co-operation will be able to make to a real improvement in the economic position of the small and medium farmer will be very small. We note that the progress achieved on the non-credit side of co-operation in rural areas through societies formed for specific purposes has been far from impressive.

7. The case in favour of the multi-purpose society as a basis for the development of co-operative farming has been expressed as follows: [1]

In recent years co-operation has included in its programme other economic aspects by establishing societies for the consolidation of holdings, purchase and sale societies, compulsory education societies, better living societies, and so on, and considerable progress has been made on these lines in several provinces like the Punjab, Bombay, etc. But even now co-ordination of these activities is lacking. Where separate societies of these kinds exist for different members, no single member gets all the benefits which are required to put him on a surplus economy. To carry out the scheme to its logical conclusion there must be as many societies in each place as the problems which give rise to the deficit budget, each endeavouring to do one particular service to the peasant to enable him to save expenditure or increase income. The possibility of organizing the co-operative movement in India in this manner is remote. Even if this was practicable it would result in considerable waste of effort and duplication. It is also doubtful if such separate disjointed efforts can achieve a single goal. The Indian peasant himself is the greatest stumbling block in the way of progress of such a scheme. He is ill-educated and conservative, with no incentive to improve his standard of life. Having become inured to a very low economic condition for a long time it is difficult for him to change his whole outlook on life, his habits and methods of work. What is possible in advanced countries like Denmark, where the whole business of agriculture is organized on economic lines and where the farmer knows his own business, is not therefore possible in India. Here it is not easy to create in the farmer an enthusiasm for all kinds of new activities at once. He cannot be induced to join a number of organizations. He is happy when all his needs can be satisfied by the same agency, and is used to the moneylender-trader who supplies all his wants. His whole psychology of life must be changed and if this is to be done

[1] Reserve Bank of India, Agricultural Credit Department Bulletin No. 1.

it is necessary that he should be taken up as a whole man and that all the aspects of his economic life should be dealt with by the same agency.

8. It has been suggested that the necessary conditions for the successful development of multi-purpose co-operation are as follows: (i) the organization of small and medium farmers in each village or group of villages in multi-purpose societies with unlimited liability; (ii) the federation of multi-purpose village societies functioning in a relatively small area—an ordinary *taluka* would be of a suitable size—into a multi-purpose co-operative union organized on the basis of limited liability; and (iii) adequate technical (and, in the early stages, financial) assistance by Government to the multi-purpose co-operative union. It is believed that, given these conditions, the difficulties referred to at paragraph 6 above can be overcome.

9. The investigations[1] conducted by the Agricultural Credit Department of the Reserve Bank of India suggest that a co-operative organization on the lines mentioned in the previous paragraph should serve the purposes we have in mind. It is an interesting fact that what is perhaps the oldest co-operative society in India, the Shamlat Society of Panjawar in the Punjab, originally registered under the Indian Registration Act on the 20th February 1892, was formed on a multi-purpose basis. Its development and example led to the appearance of an organization similar to the one we have described. The Panjawar Co-operative Union, Ltd., which was registered in 1923, operates in a part of the Una Tehsil of the Hoshiarpur district in the Punjab, and has the following objects, according to its by-laws:—

(i) Carrying on of banking and credit business; (ii) purchase and sale on common account of agricultural implements and produce and domestic requirements; (iii) the supervision and audit of registered co-operative societies; (iv) the provision of educational assistance to members of such societies; (v) other measures designed to improve the work and extend the usefulness of such societies. We understand that these objects are not merely pious aspirations embodied in by-laws but are actually realized in practice. The Union is said to have successfully weathered the storm of the economic depression and is reported to be efficiently guiding and assisting as many as 99 affiliated societies. Another instance of a successful multi-purpose co-operative union is the Kodinar Co-operative Banking Union, Ltd., in the Kodinar taluka of Baroda State. This is probably the first multi-purpose co-operative union formed in India; it was registered in 1912. The objects of this union are as follows: (i) To advance loans to affiliated co-operative societies, to inspect and supervise their work, and to take steps to accelerate their progress; (ii) to carry out works of common benefit to societies, to give them advice, to help them in their work, and

[1] The results of these enquiries have been published in a number of bulletins issued by the Bank.

to ensure their increased welfare everywhere; (iii) to supply implements, seeds, and other agricultural requirements of the societies; (iv) with the previous permission of the Registrar of Co-operative Societies to open stores for the societies; (v) to collect money in any of the following ways for the work of the union and for making loans to societies:—(*a*) shares, (*b*) deposits from members, (*c*) deposits or loans from the Government, members, other associations or individuals, (*d*) gifts; (vi) to determine yearly, with the approval of the Registrar, the amount of credit to be allowed to each society. Thus, this institution, though called a banking union, performs the functions of at least three different institutions: a bank, an agricultural supply and sale society and a supervising institute. Enquiries made at the instance of the Reserve Bank of India show that this institution and its affiliated societies have functioned efficiently over a long period. The combination of activities, which is the distinctive feature of both the union and the affiliated societies, has not occasioned any difficulty—it has in fact been the principal cause of their success.

10. Our conclusion is that "co-operative farming" must of necessity involve multi-purpose co-operation; that the difficulties referred to by the Royal Commission on Agriculture can be overcome by a suitable type of co-operative organization adapted to the requirements of the small and medium farmer; and that an essential feature of this type of organization is the federation of multi-purpose village societies, organized on the basis of unlimited liability, into multi-purpose co-operative unions constituted on the basis of limited liability.

11. There is one matter to which we desire to draw particular attention. Success in the organization of multi-purpose co-operative societies will depend largely on local leadership and official guidance and supervision. For instance, the success of the Panjawar Co-operative Union has been in large measure due to the fact that the founder-President and his successors were men of ability who commanded the confidence of the people and took a keen interest in all matters concerning the welfare of the cultivator. Again, experience in the working of the Kodinar Banking Union has shown how essential it is to employ a well-paid and efficient manager. We are of the opinion that if success is to be achieved the multi-purpose co-operative union must not only have a directorate consisting of non-officials who command the confidence of the people, but must also be provided with an efficient staff. Above all, the manager must be a person who is familiar with all aspects of village life and has been trained in the methods of co-operation. Preferably, he should be an agricultural graduate who has received training in the Co-operative Department. In the early stages progress, particularly in areas where local leaders of high calibre are not available, will depend largely on the manager's initiative and his influence with the people. The post should, therefore, carry an adequate salary and possess future prospects. It should not be impossible for arrangements to be made whereby a successful

manager will be eligible for promotion to posts in the Co-operative Department. We attach importance to this because it would be idle to expect managers to continue to work with zeal and enthusiasm, if they cannot look forward to promotion as a reward for efficient service. Again, the union would probably not be able, in the early years of its existence, to meet the cost of a well-paid manager and we consider that a grant by Government towards this expenditure would be fully justified.

We also attach importance to constant guidance and supervision by official agency, that is, by officers of the Co-operative Department. This does not mean, of course, that the activities of the union and its primary societies should be subject to strict official control. Self-help is the foundation of the co-operative movement and the directors of the union and members of the primary societies must recognize that responsibility for the working of the institutions rests primarily upon them. Every society must learn to keep its own accounts and transact its own business. But until the principles of co-operation are more fully understood we consider it essential that official guidance and control should be maintained.

12. Throughout this report we have described the numerous directions in which effort is needed in order to improve the economy of the village and we have laid stress on the role which Government must play in bringing about this improvement. We desire at this stage, however, to emphasize our conviction that the amount of improvement which can be effected by direct contact between an official organization and the individual villager is limited. It is only when the people themselves are properly organized collectively that they will be in a position to make full use of the advice, assistance and the facilities which an official agency can place at their disposal. As the Royal Commission on Agriculture observed[1]:

> It is quicker and easier in so many cases to do something for others than to teach them to do it for themselves, and the narrow limitations to the former method are apt to be overlooked. A considerable amount of seed can, for instance, be distributed by the official staff of the Agricultural Department and a million or more acres may be covered with a new type of cotton or wheat; but this result, although satisfactory in itself, is a comparatively small contribution to the problem of covering every acre in India with good seed of an improved type. Where the problems of half a million villages are in question, it becomes at once evident that no official organization can possibly hope to reach every individual in these villages. To do this the people must be organized to help themselves and their local organizations must be grouped into larger unions, until a machinery has been built up to convey to every village whatever the different expert departments have to send it. It is by such a system and by such a system alone that the whole ground can be covered. Only through the medium of co-operative associations can the teaching of the expert be brought to multitudes who would never be reached individually . . . If the cultivators of India in the mass are to be won over to the use of better seeds, to improved methods

[1] Report of the Royal Commission on Agriculture, page 468.

of cultivation, to the better care of cattle, to the adoption of precautions against animal or plant disease, it must be through the agency of their own organizations. Nothing else will suffice. With the mass of the cultivators enlisted in the campaign for their own improvement, miracles can be achieved . . . Once local opinion can be moved in favour of change, more is gained than by the conversion of an isolated individual. A whole village organized to carry out the advice of the expert is a fertile field for the propagandist; where novelty has become fashionable, the path of the reformer is made easy. What is needed in India is a new public opinion which will break away from the old custom and lead people to adopt those measures which careful research has proved to be most beneficial.

13. We are, therefore, of opinion that the future development of agriculture in the case of the small and medium farmer depends in considerable measure on the ability of Government to bring together cultivators in multi-purpose organizations of the type we have described in paragraph 8 above, to establish effective contact between those organizations and the agencies of Government and to carry through a programme of planned development embracing all aspects of the economy of the cultivator. This will be a tremendous task. We recommend that a beginning be made by carrying out a detailed survey of economic and social conditions in selected areas in each province, and by preparing on the basis of such a survey a comprehensive plan of the improvements required to be carried out by the joint efforts of a co-operative farming organization, such as we have described, and Government agency. We believe that it is only by concentrating effort in this manner in selected areas that a clear idea will be obtained of all the problems to be solved and decisions reached as to the measures to be taken for their solution.

C.—Organization of Large Landholders (Occupancy-Right-holders) and Farm-workers

14. The multi-purpose co-operative organizations described in the preceding section, are suitable for the most numerous class of cultivators, that is, for those who, whether they are occupancy right-holders or non-occupany tenants, cultivate their lands wholly or predominantly with their own labour and that of their families. This class does not, however, comprise the whole of the rural population. There are two other important classes, the "large landholders" and the "farm-workers". Large landholders are occupancy right-holders who cultivate their land wholly or predominantly by hired labourers or crop-sharers or let it out on cash or fixed produce rents. Farm-workers are those who depend for their livelihood wholly or mainly on wages in cash or in kind.

15. Large landholders are relatively few in numbers, but the importance of ensuring that they fulfil their functions adequately is great, for, as we have pointed out, the amount of land held by them is very considerable. This fact is so important that it is necessary to draw attention to certain figures which illustrate it. In paragraph 16 of Chapter I of this part of our report, we gave certain figures in regard to holdings in the province of Bombay.

An analysis of those figures shows that, while the number of holdings with an area of over 25 acres is only about 13 per cent of the total number of holdings, the land included within these holdings amounts to 50 per cent of the total area. The position is similar in the Punjab. In that province, the number of holdings with an area of more than 25 acres is only 6 per cent of the total number of holdings but the extent of land covered by them amounts to as much as 53 per cent of the total area. On the basis of the statistics available it has not been possible to make similar estimates for the other provinces. We have, however, little doubt that in all the provinces large landholders are responsible for the cultivation of a large proportion of the total area of cultivated land.

16. The main problem in the case of the numerous class of cultivators for which a multi-purpose co-operative organization is necessary, is the small size of the farm and the consequent lack of resources. In regard to large landholders, however, the problem is different. Their holdings are adequate in size. Again, as we have said, high prices for agricultural produce during the last three years have enabled many of them to repay their debts; and if, as we recommend, agricultural prices are maintained at a reasonable level during the post-war years, it should be possible for them to maintain a higher standard of cultivation than before the war. It is essential that they should do so and it is from this point of view that we stress the need for agricultural associations.

As we have explained in paragraph 45 of Chapter I of this part of our report, we believe that such associations would perform a valuable function if they undertake a critical review of the methods of cultivation practised by their members, and take steps to encourage the general attainment of the standard of efficiency reached by the best among them, so that a spirit of healthy competition may be promoted, a sense of pride in making the best use of the land generated, and the general standard of cultivation progressively increased. We would add that we include in this conception of a higher standard of efficiency not only the application of greater care and attention to cultivation but also the provision of fuller employment, better wages and better living conditions for farm-workers. It is clear that the acceptance by Government of an obligation to maintain agricultural prices at a reasonable level involves a corresponding obligation on the part of agricultural employers to improve the standard of life of farm-workers.

While we conceive the main objective of agricultural associations to be an increase in the cultivating efficiency of their members, they can also perform useful functions in promoting the interests of agricultural industry as a whole. In this connection, we would draw attention to the view expressed by the Central Banking Enquiry Committee in the following terms[1]:—

We have . . . referred . . . to the unorganized state of agricultural finance, production, and marketing. We are strongly

[1]Report of the Central Banking Enquiry Committee, page 228.

of opinion that the producer should have a forum in which agricultural opinion on all these matters is focussed and crystallized into well-thought-out programmes for the advancement of the industry. In many countries, for example, Germany, the agriculturists meet in Chambers of Agriculture for discussion of questions of common concern. We are impressed with the need for the establishment of such Chambers and the usefulness of their activity. We consider that such Chambers of Agriculture might, with considerable advantage, be established on a provincial and regional basis.

We are in sympathy with this recommendation. We believe, however, that the establishment of Chambers of Agriculture for the discussion of questions of common concern to agriculturists will not be practicable, until agricultural associations of the nature we have described have been formed in smaller areas, and have proved their worth in improving the standard of cultivating efficiency of their members.

17. The aim of agricultural development is not merely an increase in production; it also includes the allotment of a larger share of such production for the benefit of the weaker members of society. The economic position of the weakest section of the agricultural community, the agricultural labourers, must also be improved. To this end we suggest that farm-workers as a class should be organized. In making this proposal we do not contemplate that the only object and result of such associations would be an increase in agricultural wages and an improvement in the standard of living of farm-labourers. A labourer enjoying a reasonable wage is likely to be a more efficient worker than one who is ill-paid, and it may be expected that an improvement in the living conditions of farm-labourers would be accompanied by an increase in their general efficiency, and that this, in its turn, would result in increased production. We would also hope that these associations would be able to effect improvements in habits and social customs, in fact that they would operate as better living organizations. In many parts of the country the uplift of the farm-worker means the uplift of the depressed classes and we may recall the observation made by the Royal Commission on Agriculture:

> We are convinced that the best way to help the depressed classes is to get them to help themselves; to instil in them a desire for education and for the removal of their disabilities is to win far more than half the battle of their emancipation.

We, therefore, suggest that Provincial Governments should study the methods by which the formation of farm-workers' associations may be promoted and guidance and assistance given to them so as to ensure their development as agencies, on the one hand, for the economic and social betterment of their members, and on the other, as instruments of co-operation in the improvement of agricultural production.

D.—Rural Administration and Co-ordination

18. We have been concerned throughout this report primarily with the economic aspects of rural development; we have not attempted to deal with the social and cultural aspects. To some

extent emphasis on the economic aspects is inherent in the conditions of life we have described—first things must come first. The necessities of life must take precedence over amenities; and among these necessities food comes first. But economic development on the one hand and social and cultural development on the other cannot be separated into water-tight compartments, nor can the provision of social and cultural services be postponed until economic development is complete; further, progress in the economic field is conditioned by progress in the social and cultural fields. Ignorance and ill-health, no less than poverty and economic insecurity, are responsible for a mental outlook, compounded of apathy, lethargy, resignation and lack of ambition, which must inevitably present obstacles at every stage to any scheme of planned development. Economic, social and cultural development must thus go hand in hand. Rural development is not merely a question of a more efficient utilization of material resources; it includes the development of the physical, mental and moral resources of the rural population. We may draw particular attention to the slow pace at which literacy is advancing. In spite of the progress made during the last decade, over 85 per cent of the total population is still illiterate. Again, there are on the average only two primary schools for every five villages and the average annual expenditure per head of population on education amounts to the small sum of about 9 annas.

19. In the last two sections we have described the major types of organization which we consider to be necessary and suitable for assisting in the solution of the economic and social problems of three broadly different classes of agricultural society. The fundamental feature which we desire to stress in regard to these organizations is that they should be voluntary in character. The scope of their jurisdiction and authority should be limited to their members, who should be free to accept the obligations and privileges of membership with reference to their individual needs. We trust, however, that we have made it clear that it is a necessary condition of progress that Government should undertake a large extension of public enterprise in the economic, social and cultural spheres directly through their own administrative and technical organizations. It will also be necessary for Governments to guide, assist and, to such extent as may be necessary in the public interest, control the various private organizations.

20. This leads us to the important question whether the administrative machinery of the Central and Provincial Governments is adequate for the tasks awaiting them in the immediate future. Obviously this question demands the earnest and immediate attention of all Governments concerned. Towards the end of 1944, the Government of Bengal appointed a Committee, the Bengal Administration Enquiry Committee, to make recommendations for the improvement of the administration of that province. The Committee was required " to assess the work to be done by the Government of Bengal both now and in the foreseeable future in order to ensure the efficient Government of the Province of Bengal on modern and progressive lines, and to report to what extent the

existing administrative machine is adequate in structure, extent and quality, and to recommend methods of improving it at all levels to render it adequate for the efficient discharge of that work." The terms of reference mentioned in particular the suitability of the present territorial jurisdictions, the utilization of local self-governing institutions, the employment of technical personnel and the recruitment to and conditions of employment in the public services. We suggest that a similar enquiry in other provinces is worthy of consideration.

21. We do not propose to examine in detail the numerous organizational problems involved, but we desire to draw special attention to two, namely, first, the need for ensuring the highest degree of co-ordination of the various administrative agencies engaged in rural development, and, secondly, the need for the active association of representatives of the rural population with rural administration.

22. The principal proposals made by the Bengal Administration Enquiry Committee for the purpose of securing co-ordination of policy and administration in the field of development are as follows:—

(i) The establishment of a Development Committee of the Cabinet of which the Chief Minister should be the Chairman and Ministers in charge of Development Departments members.

(ii) The establishment of a Development Board consisting of Secretaries to Government in the Development Departments, together with the Secretary of the Finance Department. The functions of this Board would be, first, to prepare for the consideration of the Cabinet Development Committee an integrated provincial development plan by endorsing, modifying or adjusting the plans of the different departments, secondly, to transform the functional plans of each department into a territorial plan for each district, and thirdly, to keep constant watch over the execution of the provincial and district plans.

(iii) The co-ordination of all district development activities under a single administrative head, the District Officer. Under this proposal, the District Officer would be responsible for ensuring that the provincial development plan, so far as it applies to his district, proceeds as a combined operation. The officers of the different Development Departments stationed in the district would be directly responsible to the District Officer in every respect save that of the technical aspect of their work.

We commend these proposals, with which we are in full sympathy, for the consideration of Provincial Governments.

23. We would also draw attention to one of the suggestions which has been made in connexion with the organization of the Development Board, namely, that a provincial bureaux of statistics should be attached to that Board. We have indicated, at several places in this report, directions in which improvements are called for in the collection and compilation of statistical information and in paragraph 11 of Chapter IV of Part I, we drew attention to the need for the establishment at provincial headquarters of provincial bureaux of statistics. It is obvious that the success of all schemes

of planned development must be dependent on the availability of detailed and accurate information relating to the prevailing economic and social conditions and changes occurring therein. We, therefore, believe that a well organized bureau of statistics attached to a Development Board is an indispensable instrument of economic and social progress.

24. We now turn to the last and, in our opinion, one of the most important of all organizational problems, namely, the active association of representatives of the rural population with rural administration. As long ago as 1909, the Royal Commission on Decentralization pointed out that: "The scant success of the efforts hitherto made to introduce a system of rural self-government is largely due to the fact that we have not built from the bottom. The foundation of any edifice which shall associate the people with administration must be the village in which the people are known to one another and have interests which converge on well recognized objects." The Commission recommended that an attempt should be made to constitute and develop village *panchayats* for the administration of local affairs and visualized the system as capable of gradual enlargement to "make the village a starting point of public life." Little progress was made during the next decade. Since then, however, some progress has been achieved as a result of legislation passed in the provinces, such as the Bengal Village Self-Government Act, 1919, the Madras Village Panchayats Act, 1920 (repealed and supplemented by the Madras Local Boards Act, 1930), the Bombay Village Panchayats Act, 1930 (repealed and supplemented by the Act of 1933), the Central Provinces Village Panchayat Act, 1920, the United Provinces Village Panchayat Act, 1920, the Bihar and Orissa Village Administration Act, the Assam Rural Self-Government Act, 1926, the North-West Frontier Province Village Council Act, 1935, and the Punjab Village Panchayat Act, 1935. We have not before us complete figures showing the area and population covered by village self-governing institutions in all the provinces, but the figures available to us indicate that, with the exception of Bengal and Madras, there are large areas in which *panchayats* have not yet been constituted.

The Bengal Administration Enquiry Committee examined the working of the *panchayats*, called Union Boards, in Bengal and came to the unanimous conclusion that "neither successive failures nor criticism should be permitted to deflect Government from its objective, the setting up in the villages of self-governing bodies. We need not recapitulate the necessity for such bodies, or the benefits which may derive from them both locally and as schools for political and administrative training; but we must stress the importance of ensuring that the Union Board is properly and firmly established, for few things will contribute more to 'rural reconstruction and development' than a well-run public spirited Union Board."

We are in full agreement with these views. We consider the establishment of *panchayats* as indispensable for the development

or rural areas, and recommend that Provincial Governments should make every endeavour to establish these bodies wherever they do not now exist and to ensure that they function effectively.

25. In order to improve the administrative efficiency of Union Boards, the Bengal Administration Enquiry Committee recommended that a full-time clerk should be appointed for each Union Board. The Committee observed—

> Although we are satisfied that a union of ten thousand inhabitants will have no difficulty in producing nine men of the right type, we agree that honorary workers, most of whom must be busy in the management of their private affairs, will need clerical assistance of a type superior to that which the average Union Board now enjoys. We, therefore, propose that each Union Board should be provided with a clerk who will be paid by Government; who will be appointed and dismissable by the Subdivisional Officer, and who will be a resident within the Union. This clerk will not be part of any service; he will not be transferable; he will be a servant of the Union Board, and he will normally be a member of the majority community within the Union. We believe that a full-time, well-paid clerk of this type will ensure a great improvement in Union Board management, and will enable the Boards to discharge their functions with greater efficiency.

With reference to conditions prevailing in the ryotwari areas it has been suggested that a modification of this proposal would serve the purpose in view economically and efficiently. In such areas there is usually a salaried village establishment which includes a village officer who collects the Government revenue and is held accountable for public money in his charge. There is also an accountant who keeps records and accounts and is in possession of much valuable information which would be of use to the *panchayat*. It has been suggested that the constitution of the *panchayats* should provide for the appointment of such officers as *ex officio* members; that they should be entrusted with the duties of treasurer and secretary respectively; and that the remuneration paid to them by Government might, if necessary, be revised with reference to the additional duties imposed upon them. We have, however, not had an opportunity to examine this suggestion in detail. We commend the proposal made in respect of Bengal by the Bengal Administration Enquiry Committee, as well as the above suggestion for consideration by Provincial Governments.

The Bengal Committee also came to the conclusion that Union Boards had hitherto failed to realize the hopes entertained of them largely because they lacked guidance and supervision, and with a view to remedying this defect recommended an increase in the number of Circle Officers in the province. We draw attention to the need for reviewing the arrangements in force in other provinces in this matter.

26. We consider that *panchayats* should be encouraged to take an active part in the framing of schemes of development relating to their areas and in the carrying out of such schemes. Indeed, we consider it essential that they should do so, for the successful

execution of many schemes of rural reconstruction and development depends largely on the co-operation of the people; that co-operation should be sought and obtained through the people's local representatives, that is, through the *panchayats*. To this end we recommend that in every taluka, tahsil or other comparable territorial unit of administration a Rural Development Advisory Council should be established. We suggest that this Council should be composed of first, the Presidents of the *panchayats* of the area, and secondly, the senior officers of the Development Departments working in the area. Where private organizations of the type described in the preceding section of this chapter are functioning effectively, it will be desirable to provide representation for them also on such Advisory Councils. We would contemplate that schemes of economic and social development proposed to be undertaken in an area would be placed before the Council and its advice obtained thereon. Periodical reports reviewing the progress made in the execution of such schemes, whether by Government agencies or by the *panchayats*, might also be considered by the Council. Again, meetings of the Council would afford opportunities for discussing difficulties encountered in the execution of development schemes and deciding, in the light of joint experience, the manner in which they should be overcome. Finally, the Council meetings would enable officers of the Development Departments to enlist public support for their activities and would provide a forum in which the panchayats and Government officials could discuss local problems. As we have said, we consider it essential that the co-operation and assistance of the local people should be obtained for schemes of rural reconstruction and development and we believe that Advisory Councils of the nature we have proposed, meeting at regular intervals, would be a valuable method of eliciting that co-operation and assistance.

Summary of Conclusions and Recommendations

27. The conclusions and recommendations of this chapter may be summarized as follows:—

Multi-purpose co-operation

(i) The future development of agriculture in the case of small and medium farmers depends in considerable measure on the organization of these classes into multi-purpose village co-operative societies with unlimited liability, and the federation of such societies into multi-purpose co-operative unions with limited liability.

(ii) Each multi-purpose co-operative union should have an efficient manager. This is considered important for progress in the early stages will depend largely on the manager's initiative and his influence with the people.

(iii) The manager should, preferably, be an agricultural graduate trained in the Co-operative Department. The post should carry an adequate salary and incumbents should be eligible for promotion to posts in the Co-operative Department.

(iv) A union in the early years of its existence will probably not be able to meet the cost of a well-paid manager. A grant by Government towards this expenditure is considered fully justified.

(v) Importance is attached to constant guidance and supervision by officers of the Co-operative Department.

(vi) The organization of multi-purpose co-operative societies and unions on a large scale is a tremendous task. It is recommended that a beginning should be made by carrying out a survey of economic and social conditions in selected areas in each province and by preparing on the basis of such a survey a plan of the improvements to be carried out by the joint efforts of a multi-purpose co-operative organization and Government agency.

(vii) Large landholders (occupancy-right-holders) should be encouraged to organize themselves into agricultural associations with the object of increasing the standard of cultivation of their members, and promoting the interests of agricultural industry as a whole.

(viii) Farm workers should also be encouraged to organize themselves. A labourer enjoying a reasonable wage is likely to be a more efficient worker than one who is ill-paid, and it may be expected that an improvement in the living conditions of farm labourers would be accompanied by an increase in their efficiency and that this, in its turn, would result in increased production.

Rural administration and co-ordination

(ix) The following proposals for the purpose of securing co-ordination of policy and administration in the field of development are commended for the consideration of Provincial Governments:—

(*a*) The establishment of a Development Committee of the Cabinet.

(*b*) The establishment of a Development Board consisting of Secretaries to Government in the Development Departments, together with the Secretary of the Finance Department.

(*c*) The co-ordination of all district development activities under a single administrative head, the District Officer.

(x) The creation of provincial bureaux of statstics is recommended.

(xi) The establishment of *panchayats* is considered indispensable for the development of rural areas, and it is recommended that they be established wherever they do not now exist.

(xii) *Panchayats* should be encouraged to take an active part in the framing of schemes of development relating to their areas and in carrying out such schemes. To this end, it is recommended that there should be established in every *taluka* or other comparable unit of administration, a Rural Development Advisory Council, consisting of the Presidents of the *panchayats* and the senior officers of the Development Departments working in the area.

CONCLUSION.

THE NEED FOR A NEW SPIRIT.

We have discussed in this report the measures which are necessary to remove the threat of famine and secure an adequate diet for the people. The food problem with which we have been primarily concerned, merges into the broad problems of agricultural and economic development, and these in turn are linked up with fundamental social questions. In our report we have insisted that India does not lack the material resources necessary for advancement and prosperity, but these can be developed only by the efforts of human beings—by the governments and people of India—and success depends on the spirit which sustains the country in the tremendous task with which it is faced. In the past apathy and defeatism have been all too prevalent. Doubts have been expressed whether the basic economic and social problems are soluble at all. Poverty and hunger have been too often accepted as part of the nature of things and much of the countryside may almost be described as a rural slum where the hopelessness engendered by slum conditions prevails. Such an attitude of mind, on the part of either rulers or ruled, is incompatible with progress. Without vision and faith in the future little can be achieved.

2. At present all governments are preparing plans of reconstruction and development in the post-war period. A new spirit and a new determination are abroad. But it is one thing to draw up plans, another to carry them out. A great responsibility rests on governments, administrators and government servants of all grades, in organizing and stimulating the work of "nation building." The duties of modern governments extend far beyond the maintenance of law and order; they include within their compass social and economic development in all its aspects. To build a new India dynamic rather than static qualities on the part of administrations are required. Governments permeated by the ideas expressed in the aphorisms "safety first" and "*après moi le déluge*" are inevitably stagnant and can achieve little or nothing. There is need, too, for a change of tempo; to use a familiar phrase, the future pace of progress must be that of the motor car rather than that of the bullock cart. If administrations approach their duties in this spirit, we feel that the people as a whole will respond and co-operate in the work of development.

3. We have emphasized throughout our report the extent of the effort needed to attain the end in view. The achievements of Russia are often quoted as an example to India. Twenty-five years ago Russia was a backward and illiterate nation; to-day she is among the most powerful and technically efficient nations of the world. The problems, tradition and philosophy of India differ in many respects from those of Russia, but her situation is such that a transformation of equal magnitude to that which has occurred in Russia is called for. The tradition and philosophy

of India are based on the freedom of the individual and on his responsibility to work for the common weal. It is our earnest hope that, in her future development as an independent nation, India will find in her own tradition the vision and faith, which will enable her to create a new life for her people.

J. A. WOODHEAD (*Chairman*).
S. V. RAMAMURTY
MANILAL B. NANAVATI [1]
M. AFZAL HUSAIN [2]
W. R. AYKROYD

R. A. GOPALASWAMI,
Secretary.

M. M. JUNAID,
Joint-Secretary.

COONOOR,
Dated the 1st August 1945.

[1] Subject to a Minute of dissent. [2] Subject to a Minute.

MINUTE BY Mr. M. AFZAL HUSAIN

Science or Tradition

I accept the following conclusion arrived at in the Report: "At present the most widely consumed cereal, rice, is in short supply and the production of all protective foods—pulses, milk, meat, fish, fruits and vegetables—is quite insufficient." (Paragraph 1, Chapter III, Part II.) The deficits are placed at: cereals 10 per cent, pulses 20 per cent, fats and oils 250 per cent, fruits 50 per cent, vegetables 100 per cent, milk 300 per cent, and fish and eggs 300 per cent.[1] There can be no difference of opinion that "the diet of the greater part of the population is unbalanced and does not provide in sufficient quantities the nutrients which are necessary for health" (*ibid*). It is evident that "the production of one kind of food cannot be considered apart from that of other foods. For example, to increase the supply of milk, it is necessary to devote more land to fodder crops and pasture, and this may conflict with projects for the greater production of cereals and pulses." (Paragraph 10, *ibid.*) I am in agreement with the view that "while we have stressed the importance of increasing cereal production, it is clear that this will not improve the diet of the people in respect of quality." (Paragraph 9, *ibid.*) When considering the food supply of a population deficit in most respects it is necessary that science should have a greater place in schemes of things than tradition. Cereals, and in most parts of the country rice, may have been the basic diet of the people for centuries, but there is no reason why this tradition should continue at the expense of the health and efficiency of the population. Science and not tradition should determine the nutritional requirements of India. I differ from my colleagues on the emphasis they have laid on cereals—particularly rice. Other countries have been introducing tubers in increasing quantities in their daily food. I have suggested a cropping scheme which would supply increased quantities of proteins, particularly of animal origin, carbohydrates and fats from the same area of land, and which may, if followed, contribute materially to meet the existing deficits and pave the way for better nutrition. The slogan should be: "Grow more tubers, produce more milk."

Increase in Population

2. It is estimated that the present population of India is 400 millions, and that the annual rate of increase is 5 millions, and is likely to continue, perhaps at an accelerated speed. Therefore, in about 20 to 25 years the total population of India will exceed 500 millions (Part II, Chapter I—Population.)

[1] Memorandum on the Development of Agriculture and Animal Husbandry in India, page 2.

DECREASE IN AREA SOWN PER CAPITA

3. During the thirty years ending 1941, 7 million acres were added to the area under cultivation, but this extension did not keep pace with increase in population. In 1911 the area sown *per capita* in British India was 0·9 acre and by 1941 it had declined to 0·72 acre, i.e., by 20 per cent. Further the decline has been increasingly rapid, being 0·02 acre *per capita* between 1911 to 1921, 0·06 acre *per capita* during the next ten years ending 1931, and 0·1 acre *per capita* during the decade ending 1941. (Part II, Chapter I, paragraph 5.)

DECLINE IN AVAILABLE FOOD PER CAPITA

4. If there has been a decline of 20 per cent in area sown *per capita,* then the question arises: Has there been decline in food available *per capita*? In paragraph 17 (Part II, Chapter I) the position is stated thus—

"There is, however, no fully satisfactory evidence available that standards of nutrition have fallen during recent decades. Increasing under-nutrition would tend to raise the death-rate but the death-rate has fallen. It may of course be argued that any effects on the death-rate of increasing under-nutrition have been offset by public health measures against epidemics, the development of maternity and child welfare services, the improvement in the treatment of hospital patients, etc. The possibility may also be mentioned that average height and weight have fallen as a result of deterioration in diet—i.e., that there has been a process of physical adaptation to a decreasing *per capita* food supply. Whether there has been deterioration or improvement, the important fact is that existing standards of nutrition are thoroughly unsatisfactory. The population is indeed being fed, but fed at a low level. Under-nutrition and malnutrition are widespread."

5. As the question is of great importance, an attempt may be made to clarify the position further. The quantity of food available for consumption in a country depends upon three factors—

(i) production within the country,
(ii) decrease through exports, and
(iii) increase through imports.

I shall first deal with exports and imports.

6. The annual average export of grain, pulses and flour for 1909–10 to 1913–14 was 4·4 million tons (pulses constituted 0·2 million tons), the average for 1919–20 to 1923–24 was 2 million tons,[1] and by 1938–39 the exports had dropped to 0·8 million

[1] Review of the Trade of India, 1938–39, page 232, and 1941–42, page 224.

Note.—It is not clear from the statistics whether the exports include exports of rice from Burma. Exports of wheat were 1·3 million tons before the last war and of rice 2·4 million tons. If exports from Burma were included, then the quantity of foodgrains available now, as compared to that in 1911, will be less than 5·5 million tons.

tons.[1] Imports during 1909–10 to 1913–14 were 15,000 tons and had increased to 1·9 million tons by 1938–39. Thus before the present war there was available for consumption in the country a quantity of foodgrains approximately 5·5 million tons more than that available in 1911. This is approximately 8 per cent of 67·5 million tons, the average annual production of cereals and pulses in India.[2]

7. The next question is that of production in the country. We state " . . . statistics from various provinces indeed suggest that average cereal yields have been decreasing." (Part II, Chapter I, paragraph 20.) There is, however, considerable difference of opinion regarding the accuracy of these statistics. For instance, Sir John Russell says: "Unless we assume (as some assert) that the villager has less food than formerly, we can only suppose that the yields have increased and reports from the staff of the Agricultural Departments confirm this view."[3]

Of the factors of increased crop production the three most important are extension of cultivation, irrigation and manure. Since 1911, area under cultivation has increased by 7 million acres, and area under irrigation has increased by 14 million acres. (See statement below.) If it be assumed that the irrigated area gives double the yield of the unirrigated area, then for purposes of computation every acre under irrigation may be considered as equivalent to two acres unirrigated. On this basis (see statement below) increased area under cultivation may be placed at 21 million acres, and area sown *per capita* at 1·079 acres in 1911 and 0·916 acre in 1941. Accordingly, an increased production per acre, to the extent of 18 per cent, would be necessary in 1941 to equal the same standard of foodgrain *per capita* as had existed in 1911.

Area sown per capita British India.

Year.	Population (Millions).	Average net area sown*. Irrigated (Million acres).	Unirrigated (Million acres).	Total (Million acres).	Area shown per capita (acres).	Area in terms of unirrigated area. Total (million acres).†	Per capita (acres).	Percentage increase in yield per acre to maintain 1911 standard.
1911	231·6	42	166	208	0·90	250	1·079	..
1921	233·6	46	159	205	0·88	251	1·074	0·5
1931	256·8	49	162	211	0·82	260	1·012	7·0
1941	295·8	56	159	215	0·72	271	0·916	18·0

* Represents average for 5 years with the census year as central one. (Part II, Chapter I, paragraph 5).

† On the assumption that an irrigated area is double the unirrigated area of the same size in terms of yield.

Source: Census Reports, and Agricultural Statistics of India.

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[1] Memorandum on "Foodgrain Shortage in India," page 1.

[2] Memorandum on the Development of Agriculture and Animal Husbandry in India by the Imperial Council of Agricultural Research.

[3] Report on the work of the Imperial Council of Agricultural Research, 1937, page 16.

The other important factor in increased production is manure. Farmyard manure, the only manure which has been mainly available to the cultivator, has been inadequate to maintain soil at a degree of fertility which will give any increased yield of food-grains, particularly when cash crops got a good share of this inadequate supply. The use of improved seed has been too small, taking cereals as a whole, to produce any appreciable effect. The conclusion, therefore, is justifiable that yield per acre of food-grains has undoubtedly not increased to any appreciable extent through manuring or use of improved varieties[1].

8. Even if reduced exports and increased imports have contributed towards reduction of this deficit by 8 per cent, then, as compared to 1911, there is at least 10 per cent shortage of food-grains *per capita*. The shortage of the body-building food, i.e., proteins, must have been more than what is estimated above. Therefore, there is justification for the view generally held that food available *per capita* has declined during recent years.

Evidently, therefore, the process of the human body adjusting itself to decreased food supply, particularly, protein, has been at work. We have mentioned (Chapter XII, Part III, paragraph 22) that it has been demonstrated repeatedly that the intake of small quantities of milk, or even skimmed milk, increases the weight and stature of school children. We have also stated that this food is not available to most children. Consequently decreased weight and stature are the inevitable result.

Shortage of Food for Man and Cattle

9. The shortage of food has affected both man and cattle. Dr. Burns (Technological Possibilities of Agricultural Development in India) discusses the condition of cattle in different parts of India, and Dr. Radha Kamal Mukerjee (Population and Food Supply, All-India Nutrition Board Pamphlet No. 1) deals with the human physique. Dr. Burns divides India into three regions and correlates the condition of cattle with rainfall and feed and fodder supply. Dr. Mukerjee also divides India into three regions and correlates human physique with intake of food. In general the cattle condition and human physique run parallel. In the chart below an attempt has been made to correlate these. (i) In the zone of 70 inches rainfall cattle food is very deficient, the live weight of cattle is only 500 lb. and milk production is low. The

[1] The Royal Commission on Agriculture came to the same conclusion (page 13 of Report of Royal Commission):

"That production has increased is beyond dispute; some part of this increase is due to the enhancement of yield resulting from the expansion of irrigation, but a far larger part is due to the spread of cultivation. Only a small proportion of it can be attributed to the introduction of higher yielding varieties of crops and it is doubtful if any appreciable increase in yield can be attributed to the adoption of better methods of cultivation or the increased use of manures."

corresponding region for man shows the lowest bodily condition and intake of calories and the average body weight of human group is between 100 to 120 lb. (ii) In the intermediate region of 30 to 70 inches rainfall, cattle food is deficient, the live weight of cattle is 600 lb. and milk production per head of human population per day is 6·18 oz. In the corresponding region the bodily condition of man is low, the intake of calories is 2,500 to 3,000 and the average body weight of human group is 120 to 150 lb. (iii) In the region of 30 inches rainfall the cattle food position is satisfactory, the average live weight of cattle is 700 lb., and milk production per head of human population is 12·22 oz., and the average body weight of human group is from 150 to 170 lb., and intake of calories 3,000 to 3,500. The correlation between cattle condition and human physique is fairly well established, and a more detailed study will make it closer. Both in the case of cattle and man adjustment to deficit diets by decline in size is evident.

		CATTLE. (Dr. Burns: Technological Possibilities of Agricultural Development in India).		MAN. (Dr. Radha Kamal Mukerjee: Population and Food supply).	
70" rainfall.	Bengal, Assam, Madras (A) (Malabar, S. Kanara), Bombay (A) (City, Suburban, N. Kanara, Kolaba, Thana, Ratnagiri.	Average live wt.	500 lb.	Bengal, Assam, Madras, Bihar, Orissa, Eastern U.P.	Average body wt. 100-120 lb. Calories intake 2000–2500.
		Estimated daily requirements per head.	R: 11 lb. dry C: 0·5 lb.		
		Quantity available per head per day.	R: 7·37 lb. dry C: 0·14 lb.		
		Milk production per head of human population per day.	3·01 oz.		
30" to 70" rainfall.	Bihar, Orissa, U.P., Bombay (B) Ahmedabad, Barooch and Panchmahals Kaira, Surat). C.P. Madras (portion not included in A and B)	Average live wt.	600 lb.	Western U.P., Bombay, C.P.	Average body wt. 120–150 lb. Calories intake 2500–3000.
		Estimated daily requirements per head.	R: 13 lb. dry C: 0·75 lb.		
		Quantity available per head per day.	R: 9·52 lb. dry C: 0·19 lb.		
		Milk production per head of human population per day.	6·18 oz.		

R=Roughages C=Concentrates

CATTLE.

(Dr. Burns: Technological Possibilities of Agricultural Development in India)

Under 30" rain-fall: Punjab, N.W.F.P., Sind, Madras (B) (Anantapur, Bellary, Cuddapah, Kurnool)

Average live wt.	700 lb.
Estimated daily requirements per head.	R : 15 lb. dry C : 1·0 lb.
Quantity available per head per day.	R : 15·17 lb. dry C : 0·39 lb.
Milk production per head of human population per day.	12·22 oz.

MAN.

(Dr. Radha Kamal Mukerjee: Population and Food Supply).

Punjab	Average body wt. 150-170 lb.
N.W.F.P.	Calories intake 3000-3500

Possibilities of Increased Food Production

10. The problem is: How to remedy the position? While fully accepting the possibilities of increased crop production through scientific agriculture, it is necessary that a sound food policy should be based on definitely attainable possibilities in relation to the time factor. The materialisation of technological potentialities does not depend so much on scientific discoveries as on the extent to, and the speed with, which such discoveries are put into action. A series of factors determine the degree to which technical progress can be translated into practical results. Co-ordinated development of land and water resources, supply of cheap fuel to conserve farmyard manure, availability of cheap manures and fertilizers, mechanization of farm operations, eradication of weeds, control of pests and diseases, extermination of wild animals, effective anti-malarial measures, development of co-operation, stabilization of prices, improvement of the financial position of the cultivator, consolidation of holdings, changes in land tenures, marketing facilities, etc., all influence progress of farming. To ignore the interplay of these numerous factors will be unrealistic. With food supply of a rapidly increasing population, starting with a deficit, no risks can be taken, because complacency bred of over-optimism may lead to serious consequences. A very wide margin of safety is necessary. That such an attitude is not unreasonable may be tested on the touchstone of the achievements of the Grow More Food campaign.

Achievements of the Grow More Food Campaign

11. In the Grow More Food campaign (Part I, Chapter II) efforts were directed to increase the production of foodgrains, mainly cereals, by all possible means—propaganda, extension of

R=Roughages C=Concentrates

cultivation, double cropping, diversion of land from non-food crops to cereal crops, increased irrigation, conservation and development of manurial resources, subsidized manure supplies and distribution of improved seed, legislation, concessions, compensations, rewards and financial assistance to the cultivator. To ensure success the Central Government gave to the Provincial and State Governments for the years 1943–44 and 1944–45, a sum of Rs. 293·5 lakhs as loans and Rs. 269·9 lakhs as grants in aid of the Grow More Food campaign. It is estimated that the Provincial and State Governments spent a sum equal to the amount of the grant from the Central Government, from their own resources. In addition to the above efforts, the unprecedented high prices for cereals provided a strong stimulus to the cultivator to put his best efforts to produce more. The achievement of the powerful combination of all these forces was—

The total production of the main cereals, wheat, jowar, bajra, barley, maize and rice in India, excluding rice in Bengal, was—

(In millions of tons).

Average for the 6 years ending 1941–42.	Average for the years 1942–43 and 1943–44.
41·0	44·0

(Part I, Chapter V, paragraph 3).

Further we state: " It may at first sight appear that in view of the increase in production of 3 million tons, the difference between the average total production of the years 1942–43 and 1943–44 and that of the six years ending 1941–42, India does not now require imports. Closer examination shows, however, that this conclusion is not well-founded." (*ibid*) Because: " Having regard to the increase in consumption due to the growth of population, the increase in the *per capita* consumption of large classes of the civilian population. . . and the burden of the requirements of the defence services, we doubt whether there was any substantial improvement in the overall position during the years 1942–43 and 1943–44 as compared with previous years. We are of opinion that the present relation of internal supply to requirements is not such as to warrant the conclusion that imports are unnecessary." (*ibid.*, paragraph 7.)

12. It must be remembered that side by side with increased production, food administration in India has developed greatly. Large proportion of the urban population, and in some areas the rural population, is rationed. In spite of this, " in 1944 imports of foodgrains, chiefly wheat, amounted to over 700,000 tons and the Government of India found it necessary to distribute practically the whole of this amount to the deficit areas." (*ibid.*, paragraph 8). In view of these considerations our recommendation is: ". . . that India's need for a regular supply of imported wheat,

to cover the current deficit of wheat under the Basic Plan and to build up a central reserve of 500,000 tons, should be recognized by His Majesty's Government." (Paragraph 12.) One may, therefore, conclude that India was not self-sufficient in foodgrains before the war, and although the production has increased and food resources are being conserved, yet India is still not self-sufficient in cereals. The achievements of the 'Grow More Food' campaign clearly demonstrate that intensity of food production in India has reached a stage when, without large-scale extension of cultivation and irrigation, and increased manure supply, enhanced production of food proportionate to demand cannot be made. In the development of all these resources the time factor is important.

India's Ill-balanced Diet

13. There is another important consideration. Deficient in the production of total quantity, India suffers to a greater degree in respect of the quality of diet. The question of dietary standards has been fully discussed in the Report (Chapter II, Part II, The Problem of Nutrition) and it is stated (paragraph 1): "A human being needs not only enough food (calories); he needs also, if his diet is to be adequate for health, enough proteins, vitamins and mineral elements." "Diets which do not conform with the principles of satisfactory nutrition lead to impaired physical development, ill-health and untimely death." (United Nations Conference on Food and Agriculture.) The Nutrition Advisory Committee have found in surveys of typical urban and rural groups that "the calorie intake of some 30 per cent of families is below requirements and that even when the diet is quantitatively adequate it is almost invariably ill-balanced, containing a preponderance of cereals and insufficient 'protective' foods of higher nutritive value. Intake of milk, pulses, meat, fish, vegetables and fruit is generally insufficient." And they add: "In terms of food factors the most important deficiencies are those of protein of high biological value, fat, vitamin A and carotene, vitamins of the B group and calcium." (*ibid.*, paragraph 4.) There is low intake of vitamin C and D. The Committee further add: "Malnutrition promotes a state of ill-health and lower physical efficiency short of actual disease; which are perhaps more important because more widespread, than disease itself." (*ibid.*, paragraph 5.) Children in a poor state of nutrition suffer from impairment of physical and mental growth, adults from a low level of general health and reduced capacity for work. The advice given by this Committee is: "The positive aspects of the campaign for improved nutrition must be strongly emphasized. Freedom from disease is one thing, abundant health is another. The goal to be aimed at is the creation of a healthy and vigorous population." (*ibid.*) We have accepted the position that "the improvement of the diet of the people cannot be achieved without a great increase in the production of 'protective' foods and a simultaneous increase in purchasing power." (*ibid.*, paragraph 8.)

All those who have studied this question during recent years have arrived at similar conclusions. The Royal Commission on Agriculture referred to Col. McCay's conclusions " that with a low protein consumption, deficient stamina, moral and physical, must be expected ", and " that the general lack of physique and vigour in Bengal was most probably due to deficiency of protein in the diet, whilst the inclusion of wheat in gradually increasing proportions, as one passes north from Bihar and Orissa and the United Provinces to the Punjab, has led to the marked physical change in the population."[1] Sir John Russell says about the Indian diet: " The well-balanced diet does not require more but less cereals than at present, but it includes more of everything else, especially of vegetables, fruit and milk, and one great need for the food supply is to increase the production of these three. It is essential, therefore, to increase the yield of the staple crops so as to liberate land for the cultivation of these supplementary foods."[2] Dr. Wright quotes from the " Economist ", dated 26th December 1936: " Clearly the most important task confronting the social reformer who seeks to make India's food supply satisfy decent standards of nutrition is to increase milk production in India . . . A doubling of India's milk supply will not only increase the quantity of first-class protein available per head, but will also increase the element of animal fat in the Indian diet, which at present is largely supplied by vegetable oil." India's ill-balanced diet leading to malnutrition is a more serious national problem than mere deficiency in quantity of the food available. A sound food policy must find a solution of both types of deficiencies, with proper emphasis on " protective " foods.

Cereal Mentality

14. How will the policy enunciated in Part II, Chapter III, Food Policy, meet the situation? " Cereals are the basic food of the people of India and the food situation which has arisen during the war has emphasized their importance." " The rice-producing areas in Bengal, Madras and various other provinces are unfitted to produce any other cereal besides rice. In general, therefore, rice-eating provinces must remain rice-eating provinces." (Paragraph 3). The conclusion arrived at, therefore, is: " We consider that self-sufficiency in cereals, at a satisfactory level of intake, should be one of the cardinal aims of food and agricultural policy " (*ibid.*, paragraph 7.) The specific recommendation consequently is " self-sufficiency in cereals " supported by " control of the price of cereals to ensure a reasonable return to the cultivator " (*ibid.*, paragraph 21).

15. Regarding milk which is admitted as " the best of all supplements to cereal diets ", the conclusion arrived at is: " Looking at the problem realistically, we cannot visualize any immediate

[1] Report, Royal Commission on Agriculture, page 493.

[2] Report on the work of the Imperial Council of Agricultural Research, page 21.

possibility of increasing the production of milk to such an extent that it can become a regular article of diet consumed in adequate quantities by the poorer classes in the greater part of India: very reluctantly we conclude that the ideal set by nutrition experts—half a pound of milk or more daily for every child in the country—is not a practicable objective attainable within the next few decades." (*ibid.*, paragraph 15.)

With these conclusions I am not in agreement. The point which I wish to make is: that over emphasis on cereals is misplaced, it gives an exaggerated and unnecessary importance to this source of food, and such a policy will be a serious obstacle in the path of a satisfactory solution of the food problem of India, in a manner as will improve health, raise physical efficiency, increase capacity for work and lead to better mental growth. It is abundant health, not mere satisfaction of hunger, that should be the aim of a food policy. India is suffering, and in fact has been suffering for some decades, from a very acute famine of " protective " foods, which has brought about physical decline and inefficiency, both in men and cattle, and if not attended to immediately may have serious consequences in an emergency.

Regarding the production of " protective " foods of animal origin such as milk, the problem is undoubtedly most intricate. In fact, in the densely populated areas, proper adjustment of food and fodder balance, on which depends the production of milk, is most difficult. Under a farm economy dominated by cereal mentality, this adjustment becomes impossible. Lamartine Yates and Warriner criticize the cereal mentality in the following: " . . . It can and must be emphasized that grain production by itself will never give a high money outturn per acre and is, therefore, utterly inappropriate as a suitable farming for the crowded regions." They add: " By shifting the emphasis for his production from grain to livestock products, the peasant sets his feet on the beginning of a road which can ultimately lead to prosperity in a way that cereals never can." [1] And prosperity means better diet.

A witness, who appeared before the Commission, provided the following solution of the Indian food problem: " As a basic remedy I would suggest compulsory elementary education and supply of milk. That will encourage to bring more cattle, more cattle-manure, more crops." Sir John Russell recommended a similar remedy: " A wider introduction of fodder crops into Indian agriculture would probably effect great improvement in yields and in total output. More food for the animals would mean more manure and enhanced fertility of the soil. This was the prime factor in the improvement of British agriculture and the additional yields of grain more than compensated for the area taken from grain and used for this purpose." [2] We have dealt with " mixed farming " in Part III, Chapter VII.

[1] P. Lamartine Yates and D. Warriner, " Food and Farming in Post war Europe," 1943.

[2] Report on the work of the Imperial Council of Agricultural Research, page 46.

Proposals to produce a Balanced Diet

16. A sound maxim for food policy would be: "Take the foods which give a protein ration at minimal cost; make up the calories by the food which produces calories most cheaply and then add any cheap food which will make up any vitamin and inorganic deficit."[1] Put slightly differently, the maxim for a national food policy for India would be: "Take the foods which give the highest protein ration per acre; make up the calories by the food which produces highest calories per acre, etc." The object would be to obtain a well balanced diet, containing sufficient proteins of high biological value, carbohydrates, fats, minerals, vitamins, etc., from the minimum area *per capita*. If tubers can supply larger quantities of carbohydrates per unit area, then it will be wrong to insist on a 'full pound' of cereals as the basic ration. In Chapter IX, Part III, we have dwelt on the high yield per acre of potatoes, sweet potatoes, tapioca and bananas. We have also shown that in over-populated countries of Europe tubers (potatoes) take an equal share with cereals (and in some cases a larger share) in the diet of the people.[2] We have shown that in Germany the area under potatoes is 25 per cent of that under cereal grains, in the United Kingdom it is 17·8 and in France 14 per cent. We have shown how tapioca came to the rescue of Travancore in 1943. One or more of these high yielding crops can be grown in every densely populated region in India.

17. A tentative scheme for a more rational utilization of land is given below. The present proportion of various crops is given in column 1 and proposed proportion in column 2. Area under tubers has not been shown separately in the first column, because it is not known and is included under "other food crops." In the proposed scheme area under cereals has been reduced by 19 per cent, under tubers increased from an insignificant area to 5 per cent, under pulses increased by 2·5 per cent (20 per cent of the present area), under oilseeds by 7·2 per cent (i.e., doubled) and under fodder crops by 4·3 per cent (i.e., doubled).

Percentage acreage of different crops (British India).

	Present proportion of crops.	Proposed proportion of crops.	Increase (+) or Decrease (—)
Cereals	64	45	—19
Tubers	..	5	+ 5
Pulses (including gram) ..	11	13·5	+ 2·5
Sugarcane	1·5	1·5	..
Other food crops (vegetables fruits)	2·9	2·9	..

[1] Hutchison, "Food and Principles of Dietetics" (1941).

[2] In the southern states of the United States of America sweet potatoes take the place of potatoes.

	Present proportion of crops.	Proposed proportion of crops.	Increase (+) or Decrease (−)
Edible oilseeds (oilcake castor and coconut) ..	7·2	14·4	+ 7·2
Castor	0·1	0·1	..
Coconut	0·3	0·3	..
Fodder crops	4·3	8·6	+ 4·3
Cotton	6·0	6·0	..
Other fibres	1·4	1·4	..
Miscellaneous crops ..	1·3	1·3	..
	100	100	

18. In statement A data regarding the existing acreage under different crops with yield of proteins, carbohydrates, fats and calories have been given. In statement B the proportion of food ingredients under the present cropping scheme and the proposed cropping scheme have been compared, and also the present and anticipated milk yield and quantities of proteins, carbohydrates, fats available for human consumption per 100 acres. It has been shown that under the proposed distribution of crops the total available proteins of vegetable source increase substantially, carbohydrates also increase, and addition to the vegetable oils is very large. Increase under edible oilseeds by 100 per cent would mean twice the quantity of oilcake concentrates for cattle. Increase under fodder crops of 100 per cent would mean double the fodder supply for cattle. Loss of straw through reduced area under cereals is very small as compared to increase under pulses and fodders. It may be estimated that this extra cattle food would increase milk production by at least 60 per cent.

Thus, from the present resources of soil, irrigation, manures, etc., substantial increase in food supply can be made, by developing proper cropping schemes and through the introduction of crops giving per acre higher yields (see Statement B). Improved methods of processing should eliminate any difficulties of storage, transport, perishability, etc. If the need of the present population can be, more or less, met from the present resources, one can face with confidence the problem of the food supply of the future population through extension of cultivation, increased irrigation, increased supply of manure, improved varieties, etc. It is recognized that the scheme outlined above will not be rigidly applicable to every part of the country and shall have to be modified according to soil climatic conditions. For instance, in some places a much larger area than 5 per cent could be put under tubers, and in others areas under oilseeds could be greatly increased. Such adjustments are always necessary. Even to-day it is not every area that grows 6 per cent of cotton, nor is the intensity of sugarcane crop the same all over India. The existing cropping scheme has led to the decline of livestock with consequent decline in human physique and the proposed crop planning will lead to the improvement of livestock and finally human physique.

It is the best utilization of land resources from the point of view of nutrition which will lead to national improvement. It may be necessary to introduce varieties of crops—cereals, tubers, oil seeds, pulses, fodders, particularly leguminous fodders, which will fit into schemes of crop rotations suitable for various regions. Increased production of fruit can be obtained by better orchard practices from the existing area, and vegetable supply can be increased by minor adjustments.

19. In the proposed scheme increased area under pulses and fodders of the leguminous types, and increased farm-yard manure will raise soil fertility and crops will yield better results than have been taken in the above estimates. In so far as food is concerned, India is in a state of perpetual emergency and must be prepared to meet this emergency. India cannot continue in the traditional rut, basing her food economy on cereals. She must follow a sound food policy. Other countries have shifted over to tubers. Why not India?

M. AFZAL HUSAIN.

Statement A showing acreage, production and calories per acre of different crops in British India.

(Average for 5 years ending 1938–39.)

		Area (million acres).	Percentage to total.	Production (million tons).	Yield per acre (lb.)	Protein per cent.	Yield per acre (lb.)	Carbohydrate per cent.	Yield per acre (lb.)	Fat per cent.	Yield per acre (lb.)	Calories per 100 gms.	Calories in ('000).
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	Rice ..	68·39	28·03	24·49	806	·5		78·0		0·6		351	1,286
2	Wheat ..	25·73	10·55	7·94	694	11·8		71·2		1·5		346	1,091
3	Jowar ..	21·43	8·78	4·37	448	10·4		74·0		1·9		355	723
4	Bajra ..	12·58	5·16	2·00	358	11·6		67·1		5·0		360	586
5	Barley ..	6·27	2·56	2·22	793	11·5		69·3		1·3		335	1,200
6	Maize ..	5·79	2·37	1·97	762	11·1		66·2		3·6		342	1,184
7	Ragi ..	3·23(a)	1·32	1·23(a)	853	·7·1		76·3		1·3		345	1,338
8	Other cereals (e)..	12·97	5·32	2·89	500	10·0		66·4		3·1		334	759
	Total Cereals ..	156·39	64·09	47·11	715	19·66	69	74·34	531·5	2·0	10	348	1,132
9	Gram ..	13·77	5·65	3·34	544	17·1		61·2		5·3		361	892
10	Other pulses (e) ..	12·97	5·32	2·89	500	23·7		57·7		1·0		335	761
	Total pulses ..	26·74	10·97	6·23	524	20·06	105	59·55	312	3·37	17·7	349	831
11	Oilseeds other than castor and cocoanut (f) ..	17·63	7·22	4·02	511	24·6	125·7	22·5	115	40·0	204	546	1,268
12	Sugar-cane ..	3·61	1·49	4·97(c)	3,069	0·4		95·0		0·1		383	5,343
13	Other food crops ..	6·99	2·87	(d)	(d)	(d)		(d)		(d)		(d)	(d)
14	Castor ..	0·40	0·13	0·04	245	(d)		(d)		(d)		(d)	(d)
15	Coconut ..	0·66	0·27	1,380 m.nuts	2,090 nuts	4·5		13·0		41·6		444	(d)
16	Fodder ..	10.40	4·26	19·27	4,151	(d)		(d)		(d)		(d)	(d)
17	Cotton ..	14·67	6·01	3·59(b)	96	(d)		(d)		(d)		(d)	(d)
18	Other fibres ..	3·31	1·36	(d)	(d)	(d)		(d)		(d)		(d)	(d)
19	All other crops ..	3·25	1.38	(d)	(d)	(d)		(d)		(d)		(d)	(d)
	Grand Total ..	244·05	100·0	..	..	..	..	..	..	..	..	..	..

Source: (1) Agricultural Statistics of India, Vol. I; (2) Estimates of Area and Yield of Principal Crops in India; and (3) Health Bulletin No. 23. (a) Represents average for 3 years ending 1938–39 for the main producing areas. (b) In million bales of 400 lb. each. (c) Raw sugar or Gur. (d) Information not available. (e) 50 per cent of the area shown against "Other Cereals and Pulses" in the Agricultural Statistics, Vol. I, has been taken to be under "Other Cereals" and 50 per cent under "Other Pulses" and the production figures have been calculated at the rate of 500 lb. per acre. (f) Fat or oil content in oilseeds is generally about 40 per cent. The acreage and production figures include pure as well as mixed crops (i.e., crops *sown mixed with cereals).*

Statement B showing the proportion of protein, carbohydrate and fat in cereals, pulses, tubers, oilseeds and milk per 100 acres of cultivated area.

	Under existing distribution of crops (Average of 5 years ending 1938-39).†					Under proposed distribution of crops.					Remarks.
	Cereals.	Pulses.	Tubers. (b)	Oilseeds. (a)	Total.	Cereals.	Pulses.	Tubers. (b)	Oilseeds. (a)	Total.	
Area (acres) ..	64	11	N	7	82	45	13	5	14	77	Balance 5 acres under fodder.
Yield per acre (lb.) ..	715	524	10,000	511	9,750	..	..	..	..	..	
Protein (lb.) ..	4,422	1,156		*880	5,459	3,110	1,366	400	*1,761	6,637	
Carbohydrate (lb.) ..	34,018	3,432		*805	38,255	23,919	4,057	12,219	*1,610	41,804	
Fat (lb.) ..	641	194		1,431	2,266	450	230	1	2,862	3,543	
Calories (in '000s) ..	72,448	9,141		8,876	90,465	50,940	11,203	34,000	17,752	113,895	
MILK YIELD	per 100 acres				11·5 tons	Increased production by 60 per cent				18·4 tons	Concentrates and fodder doubled.
Protein (lb.) ..	..	..	..	..	979	..	..	..	..	1,713	
Carbohydrate (lb.) ..	..	..	..	..	1,262	..	..	..	..	2,209	
Fat (lb.) ..	..	..	..	..	1,417	..	..	..	..	2,479	
Calories (in '000s) ..	..	..	..	..	9,837	..	..	..	..	17,215	
TOTAL AVAILABLE FOR HUMAN CONSUMPTION (Population 140 per 100 acres)											
Protein (lb.)	17 per cent of animal protein				5,558	26 per cent of animal protein				6,589	plus 16 per cent
Carbohydrate (lb.) ..	..	..	..	..	38,712	..	..	..	..	42,373	„ 9 „
Fat (lb.) ..	..	..	..	..	3,683	..	..	..	..	6,022	„ 63 „
Calories (in '000s) ..	..	..	..	..	100,302	..	..	..	..	131,110	„ 30 „

(a) Excluding castorseed and coconut.

(b) Represent potatoes, sweet potatoes, tapioca and banana ; yield per acre 125 maunds.

N :Negligible.

* In oilcake. Therefore not considered available for human consumption.

† See statement A, column 2.

MINUTE OF DISSENT BY SIR MANILAL B. NANAVATI

I very much regret that I have to differ from my colleagues regarding their recommendations in respect of the permanently-settled estate system which has been dealt with in Section E, Chapter I, Part IV of the report. While offering my own views on the subject I propose also to deal in this note with some of the aspects of agrarian reforms which should be considered when the whole question of land reform is studied by the provinces in a comprehensive way as recommended in paragraph 3, Chapter I, Part IV of the report. These have been successfully adopted in other parts of the world and may serve as a guide in drawing up plans for agricultural development in this country.

A.—PERMANENT SETTLEMENT

2. *Working of the permanent settlement.*—In paragraph 4 the report has recommended that enquiries should be undertaken in the permanently-settled provinces (other than Bengal) with a view to finding the *defects in the permanent settlement which present difficulties in the way of improving agricultural production and increasing the standard of life of the cultivators*, and with a view to suggesting measures that should be undertaken, as long as the system continues to exist, to remedy the defects and remove the difficulties in question. This indicates that the permanent settlement has been looked at in the report from the narrow viewpoint of economic usefulness while, as will be explained subsequently, wider issues such as the moral implications of the system, its inequitable basis, and the degenerating influence it exercises on the vast population under it have been completely ignored. At the same time, I consider such inquiries quite unnecessary. The majority of the Floud Commission, after careful consideration of all relevant factors, have already given their verdict against the retention of the permanent settlement in Bengal. A statement of the reasons that led them to this decision is given in the appendix. The origin of the permanent settlement and the various characteristics for which the system has fallen into disrepute being the same in every province, the decision arrived at in respect of Bengal can in no way differ from that in respect of the rest. For instance, the Commission found that the permanent settlement has involved the expropriation of the rights of the ryots, has rendered land revenue inelastic, has resulted in inequalities of assessment, has deprived the Government of the close contact with an intimate knowledge of agricultural conditions, has imposed an iron framework which has had the effect of stifling the enterprise and initiative of all classes concerned, has permitted the creation of a number of parasitic intermediary interests between the zamindar and the actual cultivator, and has led to an immense volume of harassing and expensive litigation between the landlord and tenants; finally, they expressed the view that so long as the system remains, it

would be difficult to evolve any satisfactory arrangement for revising rents all over the province on an equitable basis and for maintaining the records of rights. These findings of the Commission are so clear-cut and definite that they leave no doubt about their being generally applicable to all permanently-settled areas. The decision has already been accepted by the Bengal Government and there is no reason why the other provinces such as Bihar, Orissa, the United Provinces and Assam, where the problem is practically the same, should not accept this decision as equally applicable to them.

3. As in Bengal, the Government of Madras appointed a Committee to reconsider the provisions of the Madras Land Estates Act. Their report (1938) came to the following important conclusions:—

(i) That the zamindars were really rent-collectors and that the ryots were the real owners of the soil.

(ii) That the permanent settlement fixed not only the *peshkash* which the zamindar was to pay to the Government but also the rent which the ryot was to pay to the zamindar.

(iii) That in subsequent years the zamindars who were mere tax-gatherers receiving a remuneration—about one-third of the tax collected—for this service, converted the land-tax into rents payable to themselves and enhanced these rents from time to time, also levying at the same time several illegal dues and claiming several rights incidental to the ownership of land.

The Committee's recommendations (though they fell short of proposing complete abolition of the zamindari system because they took a narrowly legalistic and conservative view of the system) are so stringent upon the landlord that had they been accepted by the Government, the zamindars would have disappeared overnight. Some of the members who wrote dissenting minutes were in favour of the State purchase of the zamindaris and the introduction of a new settlement along ryotwari lines.

Any further inquiries are, therefore, superfluous and would only involve unnecessary waste of time and funds.

4. I am fortified in this view by the replies received to our questionnaire on this point from four provinces out of the five which have permanently-settled areas to a considerable extent. The Orissa Government, for instance, observe that "the zamindars in general, whether of permanently-settled estates or temporarily-settled estates, not only do not introduce any improvement to get better yield or to protect the lands from floods or drought but exploit every opportunity for realization of enhanced rent or other dues from the tenants. No doubt, cultivators will have a better protection so far as security of their tenancy and rent is concerned under the ryotwari system of land tenure which will in its turn encourage them to improve their holdings and obtain better yield." But they doubt whether the abolition of the system which is "*the only possible remedy*" is a practicable

proposition—a point which will be met subsequently. The relevant part of replies from the other three provinces are noted below:—

Bihar.—The view that unless changes are made in the prevalent systems of land tenure, it would not be possible to secure any significant increase in agricultural production is in accord with facts. In this Province, most of the estates are permanently settled. In theory, this ought not to stand in the way of improving agricultural production but it does in practice. The elements which go to make for increased agricultural production are (1) better seeds, (2) better manures, (3) better implements, (4) better methods of cultivation, (5) adequate irrigational facilities, and (6) economic or good sized holdings. The private proprietor (landlord) in most cases cannot afford to provide the first five and where he has the means, the incentive is lacking as he stands to gain no direct financial benefit, and still collects his rent irrespective of whether he provides such facilities and services or not. So far as the State is concerned, similarly, there is little inducement to spend public money on agricultural development when the benefit of the improvement goes into private hands. . . 'Not so in the ryotwari system. There, a failure of crops consequent on lack of irrigation would directly affect the revenue as remissions have to be given. Similarly, the State has a direct interest in agricultural development as such development and increased productivity are reflected in the increased revenue at the time of revisional settlement. As regards consolidation of holdings, the existence of subinfeudation and continual partition under the Estate Partition Act and fragmentation of holdings due to the systems of inheritance in force offer real difficulties in effective consolidation under the permanent settlement whereas the process will become less difficult if the State were the only landlord.

The other view that no significant improvement in the standard of life of the cultivating class is possible without a change in the system of (permanently-settled) land tenure has also much to support it. . . The Floud Commission has shown that its liquidation can be effected in an orderly manner, as a business proposition. . .

Assam.—While the ryotwari tenure induces increased production, the opposite is the case in zamindari areas. . . Under the zamindari system there is a general feeling of insecurity and short of abolishing this outmoded system no other change will give the full result.

Madras.—(*a*) The zamindari system is defective in that the upkeep of irrigation works is beyond the financial power of zamindars and that if there is any dispute about the repair of an irrigation work or the amount of rent payable, litigation has to be resorted to. . . The zamindari system, however, appears to have outlived such advantages as it may have possessed and many zamindars even would welcome its abolition subject to reasonable compensation for the loss of their rights. (Board of Revenue, Madras.)

(*b*) Agitation to repeal the zamindari (or permanent) settlement is developing all over the country. It has been accepted as a policy by the Government of Bengal, the former Government of Bihar, etc. The Provincial Legislature, according to the Government of India Act, 1935, is not prohibited from passing a resolution to that effect and getting the sanction from Parliament. This is

bound to be done in almost every Province as there is a growing consensus of opinion in its favour even among the zamindars themselves. The only serious difference of opinion is on the nature of compensation to be given to the zamindars for the rights they have so long enjoyed and will be asked to surrender. If this is done, and the ryotwari system extends over the entire Province, there is no doubt that there will be an improvement in irrigation facilities, the maintenance of record of rights, the establishment of co-operative societies and the extension of the activities of the Agricultural Department. (Director of Agriculture, Madras.)

The replies from the provinces clearly show that permanent settlement comes in the way of increased agricultural production since no improvements could be made so long as it continues. The consensus of public opinion which is in favour of the abolition of the system, thus finds support also from official quarters. Contrary to past experience in the history of India's agricultural progress, here is a singular instance of public opinion being far in advance of the State's policy.

5. It appears to me that the permanent settlement is not to be looked at merely from the viewpoint of its usefulness: of far greater importance than this is the consideration of equity by which the merits of the permanent settlement should have been judged. The zamindar is to be done away with not only because he is unwanted but also because he has no right to be there. Had the Report attempted to trace the history of the permanent settlement, it would have thrown a valuable light on the indefensible foundations on which this system was originally based and has thrived during the last hundred years and more. I feel that it is largely because this important historical fact has been overlooked that my colleagues have made suggestions for retaining the system, however amended. The only result of attempting to mend this system will be to postpone its final abolition and also postponing agricultural progress in the meanwhile.

6. *History of the permanent settlement.*—The permanent settlement was introduced not to advance the interests of the agriculturists but to facilitate easy and regular collection of revenue. When the East India Company took the administration of the country into their own hands, an effective system of collecting revenue had to be evolved out of the chaos that had been left to them by the previous rule. But the entire absence of maps and reliable records of the areas and rent of individual holdings, lack of roads and means of communication, and want of trained staff capable of direct collection made separate settlement with each cultivator impossible. After a brief experiment in Bengal at settlement by auction for five years which proved unsatisfactory, the Company decided to entrust the collection to zamindars as it was felt that they would be a more satisfactory agency for this purpose on account of their hereditary relations with the cultivator and their strong hold over the peasant classes. Further, to enable the zamindars to be punctual in payment of revenue, the Company gave them perpetual rights in the land

and fixed the revenue for ever, so that the surplus income that would accrue from increased agricultural output might provide an incentive to improvement and extension of agriculture. As Sir William Hunter has pointed out (Introduction to Bengal Records, Volume I, page 15) prior to the introduction of the permanent settlement in 1793 " the collection of the land revenue led to yearly struggle between the local authorities and the territorial magnates. . . Before the end of the period (i.e., 1807) the permanent settlement with all its defects had rendered the collection of revenue as a matter of routine. The permanent settlement of 1793 is justly regarded as a revenue measure."

7. The immediate objective of the permanent settlement, viz., regular collection of revenue, having been realised, the system was gradually extended to parts of other provinces such as the United Provinces, Bihar and Assam being then parts of the Bengal Presidency, Orissa and Madras. But in doing so, a new kind of right was superimposed, as in Bengal, over the cultivators of the time by vesting the revenue collectors for all time to come with proprietary rights in the land. The mistake, however, was realised by some before two decades had elapsed after the introduction of the settlement in Bengal and doubts came to be expressed about the equity of the system. Lord Hastings himself was against the introduction of permanent settlement which entirely ignored the rights of the peasantry. Even the Court of Directors came to admit in 1819 that " consequences the most injurious to the rights and interests of individuals have arisen from describing those with whom the permanent settlement was concluded as the actual proprietors of the land. The mistake (for such as it is now admitted to have been) and the habit which has grown out of it, have produced all the evils that might have been expected to flow from them." The Famine Commission, 1880, also conceded this principle when they said " We can, however, feel no doubt that in all the provinces of Northern India, and particularly Bengal, it is the duty of the Government to make the provisions of the law more effectual for the protection of the cultivators' rights. This opinion is primarily based on the historical ground that they have a claim as a matter of strict justice to be replaced as far as possible in the position they have gradually lost." (Report, page 118, paragraph 24.)

" Although the intention of the legislation of recent years " further observed the Commission " has clearly been to define and protect the rights of tenants, it is proved by evidence before us that the effect produced has been very different from the object aimed at. From all quarters it is reported that the relations between the landlord and the tenants with occupancy rights are not in a satisfactory state, and are being yearly more and more hostile; so much so that a landlord will generally refuse any aid to his occupancy tenants when they are in difficulties, and will do all he can to ruin them and drive them off the land. . . The probable result of such a struggle is in favour of the more powerful combatant. and there is reason to fear that in many parts of the country occupancy rights have been irretrievably

impaired, and the point to which the efforts of the Government should be directed is, therefore, to remove this conflict of interests." (Report, page 117.)

8. It is obvious from the above, that the permanent settlement was iniquitous inasmuch as it resulted in gross injustice to millions of cultivators in these areas who were deprived of their rights in land. The system was made still more obnoxious by the zamindar who " taxes his ryots for every extravagance or necessity " (Administration Report, 1872). The helplessness of the Government was long before this time admitted by Lord Hastings when he observed that the permanent settlement " has, to our painful knowledge, subjected almost the whole of the lower classes throughout these provinces to the most grievous oppression, an oppression, too, so guaranteed by our pledge, that we are unable to relieve the sufferers." Even the law was in favour of tolerance of such oppression the policy being " to allow every point about which there could be any doubt . . . to settle itself in favour of the landholder and against the public," so that within half a century, the land system of these provinces came to have every evil feature of feudalism. In 1883, the Lieutenant-Governor of Bengal speaking before the Legislative Council remarked ' In that interval of 66 years, that is, between 1793 and 1859, while the proprietary body grew in strength and prospered in wealth. village communities perished, the pargana rates (by which the assessment of the resident cultivator's rent was limited) disappeared, and almost every vestige of the constitutional claims of the peasantry . . . was lost in the usurpations and encroachments of the landlords " (quoted by the Hon'ble Sir Azizul Haque in his " Man behind the plough." page 255).

In fact, the system should have been abolished even at the beginning of this century when the Government of India discovered that this system of tenure " which is not supported by the experience of any civilized country, . . . is not justified by the single great experiment that has been made in India."[1] Presumably, the difficulty was that having once created the vested interests, the Government considered it not a wise policy to remove them.

9. The harm done by the permanent settlement not only deprived the cultivators of their rights in land. It also led to the demoralization of the zamindars and misuse of the rights which were undeservedly heaped on them. The very fact that, during the last five decades, resort to various tenancy legislations became necessary so as to undo the mischief to some extent conclusively proves that the landlord could not be trusted to protect the interests of his tenants. Despite all these legislations, the conflict continues to this day. As is pointed out by the Floud Commission, " The complexities of the Bengal Land system have

[1] Memorandum on the Land Revenue Policy of the Government of India (1902), *vide* Report of the Bengal Land Revenue Commission, paragraph 83.

led to an immense volume of litigation. The time and attention of the civil courts are largely occupied in suits relating to interests in land, and though the court-fees produce a considerable revenue to the Government, the costs to the litigants is far in excess of the revenue and is out of all proportion to the amounts at stake. . . There is a notable absence in Bengal of that certainty as to the respective rights and obligations of the parties which a sound and satisfactory system of land tenure should provide. . . In spite of the prohibition of *abwabs* and other exactions in addition to rent which were contained in the permanent settlement regulations and in tenancy legislation, there is still evidence of their continuance in the reports of settlement operations." (Bengal Land Revenue Commission Report, page 38, paragraph 85.)

In any discussion on the permanent settlement therefore, to ignore the historical basis of the system is to overlook the fact that it was based on the bankruptcy of millions of cultivators whose grievances and appeals now lie buried in history.

10. Administrators generally take a short-sighted and indulgent view of such important issues but the cultivators have long memories of times they had to go through. So long as any vestige of old injustice and oppression continues, it would be no easy task to persuade them to adjust themselves to any new system of zamindari settlement. There is no doubt that the cultivator in the zamindari areas still carries with him the painful memories of his complete subjection to the landlord and the consequent hardships which are referred to at length by the Famine Commission of 1880 in their Report, and have been quoted above. The views of this class were very clearly put forward by the Bengal Kisan Sabha in their memorandum to the Floud Commission, in which they said "The permanent settlement has conferred unrestricted right on the zamindars and this in its turn has rendered this system just a fabric of monopoly and tyranny under its grinding pressure. . . Our experience tells us that the permanent settlement provides an iron framework within which little in the way of practical reform can be effected. A legislative reform may be placed in the Statute Book, but it can be rendered nugatory by the power that rests with the landholding class. If it is intended to tax the landholder, he can easily pass the burden on to those beneath him. One of the striking facts of the history of land legislation of the last century is that the good intentions of such Acts as those of 1859 and 1885 have come to naught and the abuses they sought to put down continued in an aggravated form. In the minds of the oppressed cultivator it is this system which perpetually strives through its various agents, the landlord, the money-lender and the Police to drive him off the land. Under these conditions, the demand for the abolition of the permanent settlement is not the result of confused thinking, but has arisen out of a deep-rooted understanding of the impossibility of tinkering with the present system of land tenure." (Report of the Land Revenue Commission, Bengal, Volume VI, pages 5–6.)

11. Any attempt at modification of the permanent settlement which does not take into account the viewpoint of the cultivators who have to bear the burden of its operation is bound to fail in practice, because the conflict of interests would continue and would grow even stronger with the organization of the *kisans* and the present no rent campaign. There is no hope of ending this tension so long as we have the permanent settlement under which there is no direct contact between the cultivator and the Government, or between the zamindars and the cultivators or again between the Government and the zamindars except for the limited purposes of collecting rent and revenue. Nothing less than removing the sense of injustice and oppression from the minds of the cultivators and thereby ending this clash of interests can ensure a sucessfully working land tenure system. But this cannot be done so long as the permanent settlement in any modified form continues as these defects are inherent in the system and would disappear only with it.

The case against the permanent settlement being so well established, it is undesirable to waste time and funds on further enquiries into the defects of the system and the difficulties it places in the way of agricultural improvement and welfare. The only hope lies in abolishing the system without further delay.

Administrative and financial implications of State acquisition

12. The abolition of the permanent settlement having been considered desirable by the Provincial Governments (*vide* paragraph 49, Section E, Chapter I, Part IV), the administrative and financial implications of the scheme may now be dealt with. According to the Floud Commission, it would take thirty years to liquidate the estates in Bengal, involving State expenditure to the tune of Rs. 78 crores to Rs. 137 crores.[1]

13. The Report pre-supposes that on account of administrative difficulties, the liquidation of the permanently-settled estate system and the settlement of the claims of estate owners and their multitudinous fragments would be a long-drawn-out process. It also pre-supposes that it would be a tremendous task to find the necessary funds to the extent of Rs. 137 crores in the case of Bengal and that the whole project, therefore, cannot be carried out within a relatively short time without financial commitments which would seriously restrict the resources of the public for other urgent schemes of development in the post-war period. These apprehensions, if true, should carry some weight but on closer examination, they do not appear to be warranted so as to rule out the possibility of liquidating the system in a relatively short period.

[1] While calculating the financial result of the scheme, the Commission gave three different estimates on the basis of 10, 12 and 15 times the net profit respectively—the three respective estimates being Rs. 77·9 crores, Rs. 113·58 crores and Rs. 136·95 crores (paragraph 128). The Commission observed that the rate of compensation which received more support than any other is 10 times net profit (paragraph 101).

14. As far as administration is concerned, from the way in which proceedings are taken district by district, it appears quite possible that the whole process of State acquisition would take a long time. But surely, the period *can* be shortened by devising a formula which in general can meet most of the requirements, now that the preliminary inquiries as to the probable method of evaluating claims have been completed by the Special Officer appointed by the Bengal Government. It should now be possible to appoint a Committee of Experts who would draw out a formula of compensation which would be applicable generally to all cases or some formulæ to be applied to cases under large categories. As far as I have understood it, the problem is: how to determine the share of the zamindar in the profits to be paid to him after deducting the cost of collection. It may be that every claim cannot be decided upon with meticulous care and precision, because estates vary in size and in the extent of their fragmentation as also in the quality of their management. But a rough and ready formula should serve the purpose. This is the first step to be decided upon. The existence of shareholders in the estate, finding out these claimants and determining their individual shares would offer further difficulties. But they should not be allowed to hold up the process of determining the claims in general. The burden of proving the claims, therefore, should be placed on the claimant.

15. Possibly, Government will have to engage special staff to settle the claims, for which purpose more men will need to be employed. At the same time, Government will have to employ village staff, train them and put them in charge of the estates as soon as the claims are determined. The war has shown that for all grades of employment, by intensive instruction the period of training can be considerably reduced. The Bengal Administration Inquiry Committee of 1944–45, known as the Rowland Committee, realizing the importance and the urgency of the problem has suggested that a special minister should be appointed to deal with this subject and probably a special organization will be created and entrusted with this work (Report, paragraph 44). They state the case as under:—

> But there is one thing which we should like to make abundantly clear at the outset, namely, that in our view, the capacity of the machine which we shall recommend will fail to achieve its maximum results in the exploitation of land and water resources if the present outmoded system of land tenure remains. Apart from this consideration, the administration of the districts in Bengal is clogged at every turn by the present system, and we cannot too strongly urge on administrative grounds alone that Government should give the earliest possible effect to the decision which they have already taken to adopt the majority recommendations of the Floud Commission.[1]

This leaves no doubt that the matter will be pursued far more energetically than is done at present. The pace of progress may be slow in the initial stages, but once the scheme is set into operation, it will gain momentum and increasingly speed up the process

[1] Report Chapter I, paragraph 16.

thereafter. The experience of recent years in administration to meet the tempo of war-time exigencies should be an additional advantage in this connexion. Measures such as rationing, the levy system, etc., which would not have been thought of as practicable in 1941 have been successfully introduced and worked in many provinces. The energies of the administrative services have successfully stood the test. There is no doubt that if the problem of liquidating the system is approached in the right spirit, the administration will rise to the occasion. Possibly now that the zamindars are feeling nervous about their own future, they would be too willing to co-operate if their assistance was sought to facilitate the whole procedure of liquidation.

16. The next problem is that of finding funds. As already pointed out, the Floud Commission while considering the financial implications of a scheme of State acquisition, gave the estimate of Rs. 78 crores as receiving more support than any other, and, at the same time, gave the maximum estimate of Rs. 137 crores as supported by some. It is the latter figure which has been taken by the report as the real requirement for the scheme. Whatever may be the correct estimate, the figure should not stagger any one if it is realized that this amount is not required in a lump sum all at once as the expenditure will be spread over a period of 20 to 30 years. Again, at no one time would the full amount be outstanding. If bonds are issued a certain number would be redeemed every year. As a parallel case it may be pointed out that though the Madras Central Land Mortgage Bank has so far issued debentures worth Rs. 3·60 crores, the amount oustanding at present is to the extent of Rs. 2·74 crores. There is, however, no necessity for the Government to go into the market for borrowing except for securing small amounts needed to acquire petty fragmented estates for which it may be desirable to pay in cash. For the rest of the estates, the claimants may be paid in bonds—interest and capital to be guaranteed by Government—which may be redeemed by annual payments within a specified period. Issue of bonds for land improvements is very common in European countries and there is no reason why this method of financing agricultural development should not be adopted with profit in India. There is no great risk involved in this method as the bonds are self-liquidating, repayments being made out of the collections made along with the land revenue. The revenue demand originally fixed at the time of the permanent settlement being pitched too low, the increment accruing from a revised settlement on the ryotwari basis would be very considerable.[1] If as is expected, the removal of the feudal interests facilitates speedy working of agrarian reforms and brings prosperity to the agriculturists, cancellation of bonds would be made easier to that extent.

[1] Cf. "It (the permanent settlement) has stereotyped the land revenue at a figure which is far below the fair share which the Government ought to receive from the produce of the land, and is substantially less than the share taken in the provinces where the land is less productive than it is in Bengal." Report of the Bengal Land Revenue Commission, paragraph 80.

17. But a more practical method would be to make payments by annuities out of the additional revenue from the resources acquired. This is the easiest and the most economical of the methods that can be thought of, as the claims will be paid out of the land assessment to be collected annually from the tenants. There are two ways in which the payments can be made. One is that the estate holder would be paid out of the collections made; if the collection falls short by any amount, he would be paid less to that extent. In this case the Government does not give a guarantee of payment. The other method is to guarantee the payments of the annuities irrespective of the nature of collections made. The former method is not desirable as it would continue the present slackness in collection of revenue. Every year, owing to the defect in the existing system, nearly 8 lakhs of rent suits are filed by the landlords and there are large arrears. But if the Government completely takes over the revenue administration, these defects would make the collecting agency more alert and efficient.

18. The report scents danger in the offer of guarantee by the State for such payments. I believe that the method proposed in the above is the least onerous of all schemes of payment, if payment is to be made at all. Under this scheme, the Government collects the revenue and then pays a portion of the collections to the zamindar towards settlement of his claims. In practice, therefore, the guarantee may amount to a small sum. Moreover, this amount would be collected subsequently.

This method of payment was suggested by me in " The Indian Rural Problem " (pages 348–49). It has secured the approval of the authors of the " Plan of Economic Development of India " popularly known as the Bombay Plan (volume II, page 16), drawn up by hard-headed businessmen who know the financial implications of the scheme. The Madras Government very recently have accepted this basis of payment by annuities and proposed it for the liquidation of a temple estate. It is to be regretted that my colleagues, although they " have had no opportunity to investigate the possibilities of these suggestions ", fear that " it may not be possible to avoid capital payments in cash or bonds in many cases such as small proprietors or creditors and there would in any case have to be a guarantee by the State of annuity payments." As far as the difficulties of the settling of the claims of " small proprietors and creditors " are concerned, these can be met by the adoption of the proposal made in the report itself, viz., compulsory consolidation of " uneconomic estates," and compulsory amalgamations of under-tenures to give effect to the principle of " one estate, one proprietor." (Paragraphs 60–61.) If it is possible to reconstitute fragmented interests in land for resettlement purposes; it is equally possible to do so for the purposes of receiving payment of annuities. As for the other argument, I do not think that we can conceive of any scheme which would not involve some sort of guarantee by Government. The States in Europe have been resorting to this method of financing agricultural

development—particularly since the last economic depression—and there is nothing in their experience to show that such guarantee is something which a Government should avoid when necessary in the larger interests of the country. Unfortunately the Government of India have never raised funds for land reforms except for the extension of irrigation projects.

Possibly the better way for Governments would be to appoint a special committee composed of men with administrative experience and business acumen to advise them on the best methods of obtaining the necessary funds and making payments in settlement of the various claims when the time of the full liquidation arrives.

19. It may be observed here that since the report of the Floud Commission, the country has undergone almost a revolution in respect of administrative methods and the technique of finance. In the near future, trained and disciplined men of all ranks from the army and civil employment would be available in large numbers whose services can be enlisted by the Government for their various developmental activities. Similarly, in the sphere of finance, the war has demonstrated that when the paramount necessity of funds is established, it can be raised to an extent unforeseen in pre-war years. Neither funds nor administrative personnel need present difficulties or make the abolition of the permanent settlement a long-drawn-out process if the imperative need of the reform is once admitted and the Government pursue the matter with determination and zeal.

Reform of the zamindari system

20. As said above, the administrative and financial difficulties pointed out by my colleagues are not insurmountable and the permanently-settled estate system could be liquidated in a much shorter period and with easier methods of finance than even anticipated by the Floud Commission for Bengal. Under the circumstances, if the energies and money proposed to be devoted to the removal of the defects were applied to the abolition of the system, the creation of an efficient administrative machinery under Government, and to the other essential forms of land improvement, it would pay far higher dividends in the restoration of the happiness of the people concerned. However, I shall now examine the defects of the system and the measures to be taken for their removal as envisaged by my colleagues. But before I do so, I may point out a very significant fact in the discussion of the subject; nowhere in the report is it stated clearly whether their suggestions are a sort of an *interim* measure to be carried out simultaneously while the liquidation of the estates proceeds or whether they should be tried first and, liquidation might be resorted to only thereafter if they did not succeed. In the absence of such a clear statement, it may appear that this is a suggestion to resurrect the whole of the zamindari system as an integral part of the land administration of the country irrespective of its

past history and present weaknesses. These are important considerations and before the scheme of mending the system is considered, the zamindar and the Government and the general public—particularly the Kisans—would have liked to know from the Commission their final decision on this point; for, from the nature of the proposed scheme both the rectification and the abolition proceedings cannot work together—particularly as the former would involve heavy costs and laborious procedures. It is easier to construct an institution *de novo* than to prop up an obsolete and worn out structure which has its foundations in distrust and disharmony. This is a significant omission and would demand clarification. Nevertheless, let me examine the scheme of reforms as propounded in the majority report.

21. In paragraphs 55 to 61 the defects of the existing system of permanent settlement are examined, which may be summarized as under:—

(1) Neglect of irrigation sources is common in all permanently-settled areas (paragraph 52).

(2) High contractual rents prevail in some estates; their incidence tends to be high where they are paid in kind (paragraph 53).

(3) In many estates, ryots owe large arrears of rent to proprietors and there is a considerable amount of litigation (paragraph 55).

(4) There is no contact between the Government and the people (paragraph 56).

(5) By and large, and subject to notable exceptions, proprietors of estates fail to make adequate contribution to the development of the resources of the estates (paragraph 57).

(6) The existence of under-tenure holders in some permanently-settled areas would be inconsistent with any scheme of reform which is based on the principle of defining the responsibility for proper management of estates and enforcing such responsibilities on the proprietors concerned (paragraph 60).

(7) The prevalence of an unduly large number of small estates might add greatly to the difficulties of maintaining proper supervision and control over the management of the estates as a whole (paragraph 61).

These were the very defects that were very carefully studied by the Floud Commission and as a result they came to the conclusion that the system should be abolished.

22. In order that these objectives may be achieved the Report recommends the following measures:—

(i) Arrangements should be made which would ensure that proprietors realize their responsibilities in time and themselves carry out the necessary irrigation works without default (paragraph 52).

(ii) The law should prescribe a maximum level of rent which should not be exceeded in any case (paragraph 53).

(iii) Not only should the process of recovery of arrears be simplified but steps should be taken to secure a generally improved standard of management of estates (paragraph 54).

(iv) Steps should be taken to ensure that the standard of management in the estates is improved and that a qualified and efficient staff is maintained by the proprietors so that it should be possible to secure the performance by the proprietors of many functions which are at present performed in ryotwari areas through an official staff (paragraph 55).

(v) The general body of proprietors should be brought up to the standard of the best among them. They should be required to set apart a portion of their net profits for utilization in a form which would visibly promote the improvement of agriculture and the standard of life of the cultivating class in their estates (paragraph 57).

(vi) The proprietors should be made to perform functions which are substantially of the same nature as those performed by the Revenue Department of Government in ryotwari areas, and of no less public importance (paragraph 58).

(vii) To facilitate successful working of these reforms, where sub-infeudation prevails, the most suitable of the following three measures should be adopted:—

(*a*) Portions of estates subject to under-tenures should be formed into separate estates.

(*b*) Fragments of estates should be compulsorily amalgamated.

(*c*) "Uneconomic estates" should be acquired by Government, the ideal aimed at being "one estate, one proprietor" (paragraph 60).

(viii) Where subdivision and fragmentation of estates have already gone too far, uneconomic estates should be acquired by Government or compulsorily amalgamated (paragraph 61).

23. The report takes the view that the defects pointed out are capable of improvement by making "the proprietor . . . *perform functions which are of substantially the same nature as those performed by the Revenue Department of Government in ryotwari areas and of no less public importance.*" The arguments advanced in favour of this view are all negative. Thus, "there is no good reason why they should not maintain the same accounts and records as are at present maintained by official agencies in ryotwari areas; nor is there any good reason why they should not be required to engage themselves in those aspects of rural development which are likely to become of increasing importance in the future." It may be pointed out that the main report has not a single point to mention in favour of the existing system as a whole except that "there are instances of estates which have set apart in the past considerable funds for religious charitable purposes and sometimes for the improvement of education and public health." The reason is, except for these few instances, the record of the estates is one of neglect and mismanagement. Moreover, under the existing

law, the owners of the estates are reduced to the position of rent-collectors, with no rights to share in the increased incomes from their estates. They are not trusted even to recover the arrears of rents from their own tenants for which they have to go to Courts. They maintain indifferent records and this is the major cause of harassment to the poor tenant and leads him into costly litigation.

To this day, the condition of the cultivators remains largely unsatisfactory as they are subject to rackrenting and insecurity of tenure. As the Floud Commission has pointed out " many of the records in the zamindars' office are indifferently maintained and sometimes fraudulently manipulated, and the peasantry, 90 per cent of whom are illiterates, are at the mercy of the unscrupulous agents. Indeed it is common knowledge that the *naibs* and other agents of the rent receivers frequently live on a scale far above that which the salaries they receive from their employers would permit . . . It is true that the successive provisions of the Tenancy Acts have endowed the ryots with the practical ownership of their land. But a large and increasing proportion of the actual cultivators have no part of the elements of ownership, no protection against excessive rents, and no security of tenure . . . The truth is that the present situation, while containing some of the features of both the landlord and the tenant and the peasant proprietorship systems, possesses most of the disadvantages and few of the advantages of either system. Under it the actual cultivator has too often the worst of both the worlds ". (Report : paragraphs 85—88). This is enough to show that the extent to which the law can reform the zamindari system within its existing framework is so severely restricted as to be valueless in practice.

24. Against this background the new proposals have to be examined. Under the new dispensation, the estate owner shall have to maintain proper accounts and employ an efficient and trustworthy staff on the basis of the Revenue Departments in the ryotwari areas and manage his estate well. Apart from his having to bear the whole expenditure of the renovated zamindari he shall have to set aside a part of his income for the development of the estate. These suggestions are to be enforced by legislation and the Government is expected to see that they are properly implemented and carried out. For undertaking these additional functions he is not to get any extra remuneration.

The suggestions made above are of such a far-reaching character that they involve the setting up of numerous independent departments similar to the organizations in the ryotwari areas within the state organization for the administration of land revenue—a suggestion which was never contemplated in the 18th century by Lord Cornwallis. However, it is necessary that the implications of the new proposals should be carefully studied with a view to seeing how far they are capable of being implemented. The first thing is to know what are the " functions of a Revenue department of Government in ryotwari areas," which are held out as an ideal for the estates to copy as these have to be " of no less public

importance." A great deal of emphasis has been laid on this point, for from 1880 to 1945 it was always been pointed out that there is no contact between the people and the Government in Bengal and other permanently settled areas as in the ryotwari tracts. As this defect has to be removed, it is proposed that the zamindari must be raised to the standards of the Revenue department.

Let us examine what such a change involves: Under the ryotwari system, the administrative unit is the district in which the executive unit is the Tahsil or Mahal. Under each district there are 8 to 10 tahsils—each in charge of a Tahsildar. Under him are Circle Inspectors for a group of villages—30 to 40—while each village has a *Patwari* who forms the smallest but the most important unit in the Revenue Administration. He maintains elaborate village records and with the help of the village headman collects the land revenue directly from landholders. He is the eyes and ears of the whole Administration. He knows his people well and their needs and requirements. The Circle Inspector is an inspecting officer whose duty is to see that the Revenue Rules and Regulations are properly observed. The Tahsildar is the unit of the organization in the collection of revenue. All the statistics of the *tahsil* are maintained by him. He is the chief treasury officer for all the departments working in the area. *Jamabandi* papers for land revenue are prepared under his supervision and he sees that revenue is punctually collected. He has powers to issue warrants for arrest or distraint on a report from the *Patwari* for arrears of land revenue. All disputes of a revenue nature are settled by him. His office is in constant touch with the Settlement departments for the maintenance of land boundaries. During famines or years of scarcity he has to prepare preliminary estimates of crops and the *annavari* for the purposes of granting remission and suspension of land revenue. He is the man who doles out the *takavi* grants. Besides doing his work as a Land Revenue Officer, he works as a *Bundobasti* Magistrate even where the executive and judicial functions are separated. For this purpose, he usually enjoys the powers of a second or third-class Magistrate. He records confessions and attends to *Panchkyas* in deciding cases of serious offences. He helps the police in the discharge of their functions. As a matter of fact nothing can happen within his jurisdiction without his support, co-operation or sympathy and that also would be the case in a village where the *Patwari* rules. Thus both of them wield great influence over the people.

25. Under the administrative system of India, the Department of Land Revenue occupies the pivotal position and will continue to be so for years to come. As the Simon Commission has pointed out: Even from the purely administrative aspect, it (land revenue) is of special importance, for the land revenue officer resident in an area has been for centuries the centre of governmental authority. The 'Collector' of land revenue represents Government in his district for many purposes. He is the chief magistrate

of the district, and many of his principal revenue subordinates exercise important magisterial functions. On him has rested the local responsibility for maintaining law and order, and . . . he everywhere continues to be the officer who co-ordinates the activities of the various governmental agencies in his area. On him and on his revenue subordinates, the Government still depends for maintaining contact with the whole population in his area and for information concerning its general welfare. All this is not an innovation introduced within the period of British rule, but the continuance of a more ancient system which made the other functions of Government gather round the collection of revenue. Thus both the Tahsildar and the *patwari* occupy highly responsible positions in the administration. Over the Tahsil Officer are the Subdivisional Officers and above them is the Collector. The Collector is the head of the district administration and looks after the moral and the material welfare of the people apart from his duties as a Revenue Officer.

During recent years, the importance of revenue officers has been very much enhanced as a result of the various programmes for the development of rural areas. For this purpose, Tahsildars are sometimes recruited from agricultural graduates. The position and status of the *patwari* is also being raised. For a long number of years he was ill-paid and freely allowed to fleece the people under him During recent years his importance in the village economy has been recognized. Nowadays he is a better educated man, receives higher remuneration and is specially trained for developmental work so that he can be more useful to the village. In years to come he will be more and more trusted and availed of for all works of village improvement for which there is an unlimited scope.

These services are again fairly well paid and provided with chances of promotion higher up or in other departments. A capable Tahsildar can, thus, become a Collector, and a *patwari* a Tahsildar or a Subdivisional Officer. They get decent pensions. They have good leave regulations and in many cases are provided with comfortable houses. On all occasions involving additional duties, they get extra allowances and their rights are protected by elaborate regulations.

26. We shall now consider how far these functions could be delegated to a private agency. This problem has to be considered from three distinct points of view, viz.—

(*a*) that of the estate owner;

(*b*) that of the *Kisan*; and lastly

(*c*) that of the Government.

The estate owner.—The main report does not make it clear whether the whole machinery of revenue administration of the type existing in the ryotwari provinces is to be maintained by the estate owners, and, if so, whether they would be vested with the usual revenue and judicial powers. For the unity of the

administrative organization, such powers would have necessarily to be given to the landlords if they have to be fitted into and made a component part of the provincial administration. The point here for consideration, therefore, is whether a private agency can be trusted to undertake the maintenance of an organization of the nature described. Four main objections arise when this question is considered:—

(*a*) The average zamindar is rarely a capable manager of his estate, much less a good administrator. At least, he has not the reputation of being either. I have not with me, at this moment, the necessary statistics to show the extent of the estates that have gone under the Court of Wards for reasons such as mismanagement, indebtedness, fraternal quarrels, minority administration, etc., but there is reason to believe that their number is not inconsiderable. In fact the whole system would have succumbed long ago for this very reason if the Government had taken a strictly legalistic view of the various obligations of the zamindar. As the Floud Commission pointed out, " Indeed, it is maintained by some observers that if the present system remains unaltered, with a strict observance of the Sale Law and a more sparing resort to the protection of the Court of Wards, there will be a complete breakdown of the whole system. " It is incredible to expect that the class of such landlords and their staff could be transformed, with the help of legislation, into administrators functioning as efficiently as the Revenue Department of the Government, and performing " many functions which are at present performed in ryotwari areas by an official staff." (Paragraph 10). Such efforts will have no basis in reality and are bound to fail.

(*b*) Secondly, the zamindars as a class are too numerous. In Bengal there are more than a hundred and fifty thousand estates —permanently settled, revenue paying, revenue free and temporarily settled. It would be no easy task to rationalize them on the basis of " one estate, one proprietor. " It would be an equally tremendous task for the Government to find someone out of the various interests who would willingly submit himself to be responsible for the administration of the estate. Further, subdivision, fragmentation and partition of estates would create complications to avoid which it might be necessary to consider the application of the law of primogeniture and impartibility.

(*c*) Thirdly, it is highly problematic whether the estate owner can be trusted to run the revenue administration on a systematic basis as a unit of an organized institution. He may die leaving a minor or a widow, brothers may succeed him and the whole estate may be subjected to endless litigation; the owner may fall into debts and squander his substance; all sorts of contingencies may occur and disturb the efficiency and break the continuity of estate management and thus throw the administrative machinery out of gear.

(*d*) Fourthly, the question is of funds. At present the estate owners are unable even to maintain their tanks. The

cause is said to be that either they have no funds or they are unwilling to spend them. Is it possible then that they would be able to maintain an elaborate machinery as proposed in the main report and spend enough for its smooth and successful working? If the scheme is forced on them, would their employees work efficiently with their loyalties divided between the landlord and the Government?

These are very important issues and no Government can ignore them before entrusting such responsible functions of administration to a private agency.

The Kisan.—The scheme may now be considered from the viewpoint of the Kisans. Their attitude towards the zamindars has been already noted. I have not the least doubt that they would prefer Government putting up their own agency rather than to submitting themselves to the administration by people against whom they had to struggle over a century. They surely do not want a perpetuation of the iniquitous feudal system for the abolition of which the kisan strove hard for more than two hundred years.

The Government.—Lastly, it may be asked, from the view point of the State itself: Would Government be justified in handing over the revenue administration to a private agency which, as Lord Curzon pointed out in his Memorandum of Land Revenue Administration in India, has no parallel in the world? The suggestion made in the main Report, if accepted, would make the zamindari a still more unique institution in the world. The objective of the scheme is to chaznge over the existing defective machinery of collection of land revenue to the administration of the Revenue Department as in a ryotwari area merely to ensure better estate management. But modern ideas of human welfare and the functions of Government towards their promotion are fast changing. The old conception of State responsibility, viz., for maintenance of law and order and the collection of taxes has been long replaced by a much broader one. The principle of *laissez faire* is fast receding in all countries and the Government is stepping into every field of social and economic activities. The rural problems, with which we are here concerned, are looked upon from a sociological basis and such social factors as nutrition, health, housing, education and leisure are regarded as part and parcel of the socio-economic responsibility of the modern State. The Hot Springs Conference has set a new objective of this type for all countries and India is starting to work in that direction. Under these circumstances, for any civilized Government to hand over the administration of a most important department of State to a private agency with a very disappointing record behind it as we know from its history, is inconceivable. The zamindari institution is too obsolete to fit into any Government organization. Any attempt to enforce such a measure would not only fail to benefit the people but would meet with friction and disharmony at every step and be a perpetual source of embarrassment to Government.

27. In conclusion, the important issues arising out of the discussions may be summarized as under—

(1) Is it possible to convert the permanently-settled estates, within their existing framework, into an efficient department of land revenue as in the ryotwari areas and force them to perform the same functions by legislation?

(2) Will the estate owner agree to the expenditure to be incurred for the resettling of the estate on the new basis for which there will be no return to him whatsoever?

(3) Under modern conditions when the functions of the State are fast expanding, is it justifiable for it to hand over the administration of the most pivotal department of the State, viz., the Land Revenue department, with all its ramifications to a private agency?

(4) Will the new schemes of land reform, rehabilitation and social reform intended for rural areas be adequately carried out under the aegis of a private agency?

(5) Will the Kisans for whose benefit apparently this scheme is adumbrated give their willing co-operation to the zamindars, bearing in mind the past history of their relations?

(6) Is there any part of the world where such an experiment has been successfully tried?

I have not the least hesitation in saying the questions raised above can be replied only in the negative. Of course it is always desirable to get the help of every section of society for the development of the country but to expect that an institution of private estate owners can be forced to become an important department of State is hardly believable. There are various ways open to the zamindar to offer his services to the State and the people if he is so inclined. But as far as his transformation into an efficient and benevolent estate manager is concerned, it has to be noted that the principle of "*noblesse oblige*" must either work spontaneously or not work at all as it is not capable of legal enforcement.

B.—Agrarian reforms.

28. No scheme of agricultural planning for the post-war period would achieve material results if it overlooks the adverse effects of a defective land tenure system on the productivity of land. It is one of the prime requisites of land reform that the cultivator himself should have a holding of a reasonable size which he can call his own and from which he can get at least a certain minimum standard of living. As far back as 1889, Dr. Voeleker, Consulting Chemist to the Royal Agricultural Society, pointed out in his report that defective land system is one of the causes of low productivity of agriculture in India (Report: page 289). He also maintained that "the feeling of possession is one that acts as a strong incentive to agricultural improvement and it should be fostered in every way" (*Ibid* page 159). The fact is that the

basic land system of the country, the distribution of ownership of land, the terms on which it is held and cultivated, and the relation of the cultivator to the landlord and the Government—*each of these factors has its effect on the productivity of land.* Failure to recognize this fact has led the main Report to take the narrow view that a scheme " designed merely to replace one land system by another " is of less importance than " schemes of irrigation or industrial development which . . . are calculated directly to increase the productive resources of the country." There is no justification for such a view which considers land tenure reform as less important or less effective than " direct " land improvement. Agricultural efficiency is determined as much by the social, economic and legal status of the cultivator as by technical perfection of implements and soil. The two have necessarily to go together. The former " reforms " the cultivator himself and gives him the needed incentive; the latter improves the soil, agricultural technique and farm equipment. Much of this general bias towards the technological improvement of agriculture may be attributed to the unfortunate omission of land tenures from the terms of reference before the Royal Commission on Agriculture. Had that opportunity to go into the problem been availed of, the serious consequences of this system would have become apparent, and that would have helped to place the whole problem of agricultural development in its proper perspective.

29. The abolition of the zamindari system, therefore, is advocated not as an end in itself but as an indispensable means to higher agricultural production and a more equitable distribution thereof. The acquisition by the State of all proprietary interests between the ryot and the State is only a beginning in a comprehensive plan for agricultural development. As the Government of Bihar have pointed out in their reply to our questionnaire, " The acquisition should be followed by large scale reorganization of agriculture including co-operative farming, large scale irrigation and intensive and widespread application of all well-known methods of agricultural development, besides providing outlets for surplus agricultural labour. There should also be extensive education, health and other facilities and amenities and the huge loss of wealth and capital caused by epidemic among men and cattle must be prevented. The increased resources of the State should render all these possible."

30. In view of the increasing pressure of the population on soil, only such a comprehensive view of land reform can save the situation. It is not enough to pin our faith merely to large scale industrialization and a few measures for improving the technical development of agriculture. This is an important lesson which emerges from the " economic development " of India during the last 20 years. We have also before us the example of U.S.A. where in spite of vast industrial development, the conditions of a great part of the agricultural community has become increasingly precarious. As the Report of the President's Committee on Farm

Tenancy (1937) points out: "For the past 55 years the entire period for which we have statistics on land tenure, there has been a continuous and marked decrease in the proportion of operating owners and an accompanying increase in the proportion of tenants. Tenancy has increased from 25 per cent of all farmers in 1880 to 42 per cent in 1935. Because of debt, the actual equity of operating owners is far less than these figures indicate." The United States Government therefore felt it necessary to adopt strong measures to help the various groups which are "at a disadvantage in their relationship to the land" (viz., the tenants, croppers, farm-labourers, families on submarginal land, families on holdings of inadequate size, owner families hopelessly in debt, and farm young people unable to obtain farms) to find their way up the "agricultural ladder" and thus to increase the number of owner operated farms.

31. Similar has been the effort on the part of European countries whose progress in this direction will be subsequently noted. The time has come when agricultural experts no more place complete faith in technical improvement of agriculture and discount the importance of reforming the land system. As Mr. R. H. Tawney observes, "Improvement of agricultural methods is, no doubt, indispensable; but it is idle to preach that doctrine to cultivators so impoverished by the exactions of parasitic interests, that they do not possess the resources needed to apply it. In the Europe of the nineteenth century, the reconstructions of the legal fabric of the land system preceded the modernization both of productive technique and of the business side of farming; nor in the absence of the first, would the last two have been possible." (Agrarian China, Introduction p. xviii.)

Recently, in India, the Directors of Agriculture have begun to realize how land tenures hinder agricultural developments. In paragraph 4 of this note, I have quoted the opinion of the Director of Agriculture, Madras, advocating the abolition of the zamindari system. The Director of Agriculture, Bombay, who appeared before us also drew our attention to this and said "I think the greatest handicap to increased food production is not technical but economical in this Province. There are various economic disabilities under which the cultivator is labouring at present, such as land tenure; and it is hopeless to expect any very large increase in his yield. Of course, it applies only to smaller areas, but the question of agricultural debt is a province-wide problem." He advocated the same reform before the Policy Committee No. 5 on Agriculture, and observed that "The question of existing land tenures was very important because these usually went against the application of technical improvements."

The former Commissioner of Agriculture, Baroda, now the Minister-in-charge of development who was also Director of Agriculture in the United Provinces for nearly three decades, has expressed a similar opinion; referring to the possibilities of increased agricultural production, he has pointed out the disabilities from which the country was suffering, some of them being of

economic origin and others created by custom, the continued influence of old practices, the increase of population, defective tenures and the like. The details of these causes, he summarized as under:—

" (1) The unduly small holding relative to the productivity of the soil.

(2) The fragmentation of holdings.

(3) Lack of incentive, the outcome of a defective tenure or method of rental payment.

(4) Existing indebtedness as reacting on (5).

(5) Lack of working capital.

(6) Defective marketing.

(7) Loss of labour time.

(8) The ownership of what would be productive land by inferior cultivating castes.

(9) Lack of crop control and crop planning.

They provide between them a very formidable mass of disabilities which react in many cases very seriously against the possibility of removing technical disabilities and in certain cases must militate against the possibility of a good deal of what has been dealt with under Section I. In short, unless they can, where and when they occur, be faced and drastically dealt with there is very little hope of 75 per cent of the agricultural land in India being caused to produce much more than it now does . . . In certain tracts lack of incentive as created by a bad system of tenancy farming, as unfair rental basis, rapacious landlords who do nothing to stimulate production and other like factors is a striking cause of low production."

32. There is no doubt that such candid criticism of the existing tenure system by agricultural officers will gather strength as they go deeper into the study of the causes of failure of agricultural improvements to yield results expected of them. That the yields *are* going down is evident from the following statement of average yield of crops during the decade 1931-32 to 1940-41 in some of the provinces:—

(In lb. per acre.)

Annual average of	Rice.		Wheat.		Sugarcane.			(Raw sugar or gur.)	
	Bengal.	Bihar.	C.P.	Bombay.	Bengal.	C.P.	Bombay.	U.P.	Delhi.
1931–32 to 1935–36	896	738	666	428	624	443	5,906	3,275	1,880
1936–37 to 1940–41	837	676	590	394	577	430	5,587	2,739	1,523
Decrease	59	62	76	34	47	13	319	536	353

It was also noted in our Report on Bengal that the normal rate of yield of the *Aman*, *Boro* and *Aus* crops in the province has gradually declined during the last decade and a half (Appendix II, page 207).

Another drawback similar to that of defective tenure (as indicated by the Commissioner of Agriculture, Baroda, in item 8 above) is that as a result of socio-economic changes in this country during the last hundred and fifty years, the farming community

to-day is no longer a homogeneous class of people with a definite standard of efficiency. Available statistics of the present pursuits of certain "occupational castes" show that 67 per cent of workers who have given up their traditional non-agricultural occupation have now taken to agriculture and allied pursuits.[1] This heterogeneous character of the agricultural community is a significant factor depressing the efficiency of Indian Agriculture.

This indicates that the problem of agrarian economy is too complicated to yield to the only approach however persistent, made so far, namely, that of technical development.

33. It is imperative to note here that while the Departments of Agriculture in India are pursuing a narrow ideal of technical improvement in agriculture, the Department of Agriculture of the United States has extended its sphere of activities far and wide so as to cover almost every aspect of rural life. On the one hand, it administers relief on a nation-wide scale to millions of farm families thrown into distress by the economic depression during the last ' thirties ' ; as a result, agricultural labourers, tenants and share-croppers have been able to secure better contractual terms with their employers and a considerable number of them have been helped to feel their way up the " agricultural ladder " to farm-ownership. On the other hand, the department has also put into operation various schemes of a long-range character for the economic and social progress of the farm population. The determined and organized effort of the department to bring an all-round improvement in every stratum of the agricultural society is evident from the following words of Henry A. Wallace, Secretary of Agriculture[2] :—

To build an economic democracy that will match our political democracy our people must have facts. Few agencies have been as persistent in digging out facts as the Department of Agriculture. Its scientists have a long and honourable record in their never-ending quest, and they have added much to human knowledge in the fields that are vital to every one of us.

The investigations of the Department of Agriculture are not confined to natural sciences under the necessities of modern life—many of them arising out of the revolutionary discoveries of science —the department has had to pay more and more attention to economic and social problems as well. It has been building up a notable body of knowledge in these fields.

In accordance with these ideals, the department has undertaken measures of a comprehensive type for the reform of tenures and tenancies, started agricultural banks, taken measures to sustain prices of agricultural products, and is financing schemes of soil conserving, electricity to rural areas, land reclamation and utilization schemes besides others of far-reaching character. As important as the comprehensive character of the developmental programmes for agriculture is the method in which it is implemented.

[1] Table XI, pp. 414–19, Census of India, 1931, Volume I, Part II.

[2] " The Farmer in a Changing World." (Year book of Agriculture, U. S. A., foreword.)

Here, the department does not rest content with merely creating facilities for the uplift of the people, but gets into direct contact with the needy individual, studies his problems, gives him the necessary guidance and assistance, and then watches over the results. There is, thus, a direct and continued contact between the department and the people it seeks to benefit. At the same time, it is realized that there can be no one remedy which can be generally applied to all classes of agriculturists. The conditions of the labourers, share-croppers, tenants, small holders and the various agricultural groups are studied individually—each on its own —and suitable measures are evolved for each group to tackle its particular problems.[1]

34. In fact, the task that lies ahead for India is of far greater magnitude than that which the United States have set themselves to solve, as the indigence of the people in this country is more deep-rooted and widespread. The pressure of the population is increasing so fast that no plan for agricultural development can afford to ignore it. Moreover, the poverty of the Indian rural people is not a product of economic forces alone; it is also a result of several other factors such as obsolete land systems, unhealthy environment neglected mental and physical development, conservative caste and religious beliefs, customs and practices, and a disintegrated rural society. It is, therefore, necessary that our Departments of Agriculture are imbued with a spirit of searching inquiry into the various causes of the poverty of the people and take a comprehensive view of the problem before them. Similarly, instead of having broad-based measures of general application to all classes of agriculturists, an intensive effort towards bettering their material condition must be made by studying the requirements of the several classes and by devising the ways and means of uplifting *each* of them.

35. From this it must be evident that resolute action is needed to reform India's agrarian economy from every side beginning with land reform. The objectives of such action are—

(*a*) All lands should be owned by Government, i.e., the intermediate feudal interests should be removed.

(*b*) Occupancy rights should be given to cultivators with certain reservations such as, restrictions as to subdivision of the plot, transfer of land, etc.

(*c*) These holdings should be economic units and should be, as far as possible, in one block.

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[1] "In 1934, the U.S. Department of Agriculture opened a rural rehabilitation division to assist the destitute farm families and other families residing in rural areas to become self-supporting and independent of emergency relief aid." "By April 30, 1940, some 837,000 families had received such loans. Many had lifted themselves out of a hopeless situation to self-respect and honest livilihood. More than 114,000 families had repaid their loans by that date. A survey of 360 thousand borrowers made in December 1939 showed that they had increased their net worth by 26 per cent and their net income by 43 per cent since the coming of the farm administration programme. In addition they had increased the amount of food produced for home consumption from a total value of $54,160,567 to $ 89,038,910."

(*d*) The land should be cultivated by the man who owns it.

(*e*) The cultivator should live on the farm or as near to it as possible.

(*f*) The land should not be used as security for unproductive purposes.

(*g*) The holdings should be taxed on a graduated scale.

These are general propositions and should be modified to suit local conditions.

The agrarian reforms in European countries after the Great War were based on these lines[1]. The methods adopted by them to achieve the abovementioned objectives are—

(*a*) Buying up of big estates and setting up of small cultivators thereon;

(*b*) Putting restrictions on the transfer of land;

(*c*) Imposition of low rental so that landowners who do not cultivate may have no incentive to hold lands;

(*d*) Financial assistance to tenants to buy land;

(*e*) Creation of non-attachable farm properties;

(*f*) Prohibition of attachment or subdivision of properties by the declaration of the owner to the judicial authorities that the said properties are " family " properties;

(*g*) Preventive measures against the division of land on succession.

36. These reforms have recently been reiterated by the representatives of immigrant governments residing in London in 1944 in their " Report on agrarian problems from the Baltic to the Aegian." The results of these reforms are summarized by the International Institute of Agriculture, Rome, in their bulletin on " Land Tenure Systems in Europe " (page 71)—

" The immediate result of the agrarian reform has been to transform the traditional agrarian structure of the countries of Central and Eastern Europe. The disproportion between large and small estates has been eliminated, and the present distribution of landed property differs in a marked degree from that obtaining before the (Great) War. About 20 million hectares have passed from the hands of landowners into those of small agriculturists.

Small rural undertakings now provide work for between twice and three times as many persons per unit of area as large undertakings; and their increase in number has thus led to an increase in the total number of peasants.

The formation of a class of peasant proprietors is of fundamental importance in the social and economic organization of these countries; and it is in this connexion that the profound historical significance of the agrarian reforms arises.

[1]Land Tenure Systems in Europe: League of Nations Document No. 2 for the European Conference on Rural Life (1939).

37. Measures of the above type will have to form a part of a comprehensive programme for the development of India's agriculture. Unless the Government energetically pursue such reforms, the basic problems of our agrarian economy will remain unsolved. The greatest obstruction to the progress of such measures is the existence of a variety of vested interests that have cropped up in our land system. These interests are not confined to the permanently or semi-permanently settled estates which cover about 50 per cent of the total area but are operating all over the country in various forms. Instances of these are the " Inam " tenures in Madras and Bombay and " Revenue-free estates " in Bengal and Bihar, and many other tenures of a similar character. These owe their origin to grants made by former rulers of the country in recognition of past services or for the upkeep of religious and charitable services. Apart from the feudal overlordship of the zamindar in the permanently and semi-permanently settled areas, there is, under these, a multi-decked hierarchy of absentee landlords thriving on a vast number of share-croppers. Even in the ryotwari areas, similar interests are presenting themselves in the form of absentee landlordism—more than 50 per cent of the area in the Punjab and 30 per cent in Bombay being in the hands of non-cultivating owners; conditions in Sind and Madras are no better. This evil of absentee ownership is still spreading over the country. India is pre-eminently a landlords' paradise—nearly 70 per cent of the cultivated area being under their hold. India's agricultural economy has thus come to be characterized by the existence at one end, of a flourishing class of landlords with no interest in agricultural development, and, at the other, a vast number of indigent people, illiterate, ill-equipped to struggle for existence, suffering from mal- and under-nutrition and thus falling a ready prey to famines and disease as we recently (1943) saw in Bengal, Bihar and Orissa and to a less extent in Madras and Bombay.

38. The fundamental problem of agriculture, therefore, is to transform this occupation from a mode of living into a business proposition for the benefit of the cultivating classes. Large-scale industries would produce wealth but absorb a very small percentage of men. The real solution therefore lies in the readjustment within the agricultural economy itself. All our energies should be directed to reforms on the lines of these two objectives. This would necessitate a readjustment of land ownership and reform of land tenure systems so as to facilitate increased agricultural production and its equitable distribution. The only alternative to taking such measures is to witness an accentuation of the various evils in our agrarian economy, such as absentee landlordism, further subdivision and fragmentation, greater subinfeudation and an increasing number of " uneconomic " holders, share-croppers, tenants-at-will and landless labourers. The policy of uncontrolled and unco-ordinated action must disappear.

As for the measures to be taken to reform the agrarian economy the first step is to know the facts showing how that economy is operating. Unfortunately the most essential statistics and information on land, holdings and the improvements of the cultivators are lacking. This defect must be removed at the earliest date. This information, when collected, should be supplemented by rural censuses taken every five years as in the United States of America or *ad hoc* censuses as on the continent of Europe. The second and equally urgent need is for the Central Government to establish an efficient organization with the best of experts who may be available, make their own independent studies and help the Provinces and the States to frame a concerted policy. The Central Government should provide the necessary funds. The third step is to adopt rehabilitation measures of the nature adopted in the U.S.A., where the cases of groups of men under different categories such as uneconomic holders, tenants-at-will, crop-sharers are carefully studied and efforts are made first to resettle them by various measures and then to apply these in a general way. The rehabilitation measures are not confined to land settlements alone but to every aspect of their life in a co-ordinated form so that the whole man is dealt with and put on the way to prosperity. In India our task is very difficult where we have to plan for masses of illiterate men. Therefore, along with the measures recommended for land reform, other measures for " rehabilitation " would also be very necessary. This alone will give as nothing else would, a real insight into the problem. While framing policies for this purpose, the approach should be realistic, since it is easier to suggest remedies than to apply them successfully. In general, unless such comprehensive measures are taken, there is little hope that we will have set ourselves to effectively solve for this country the most baffling problem of our economy, namely, poverty in the midst of plenty.

MANILAL B. NANAVATI.

APPENDIX TO MINUTE OF DISSENT.

Reasons which led the Bengal Land Revenue Commission to recommend the abolition of the Permanent Settlement.

1. The zamindars in Bengal never had an absolute right of property in the soil; nor was it intended to give them such rights by the Permanent Settlement.

2. The existing system has rendered land revenue almost entirely inelastic for about 150 years and the share which the Government ought to receive from the produce of the land is substantially less than the share taken in provinces where there is no Permanent Settlement and where lands are less productive than it is in Bengal.

3. It has deprived the Government of the benefit of more valuable crops and higher prices and of any share in the increase in the value of land due to increase of population and extension of cultivation or growth of towns and the development of trade and industries the benefit of which is appropriated by a few. Government also does not get any share in the profit from mineral rights and fisheries in certain navigable rivers.

4. It has resulted in inequalities of assessment having no relation to the productive capacity of land.

5. The system has deprived the Government of the close contact with and intimate knowledge of rural conditions which the *ryotwari* system affords.

6. It has imposed an "iron framework which has had the effect of stifling the enterprise and initiative of all classes concerned" with the result that the efficient landlord-tenant system as visualized by Lord Cornwallis has not been realized. On the other hand the "evils of absenteeism, and management of estates by unsympathetic agents resulting in unhappy relation between the landlords and tenants have grown to such an extent that Government has been compelled to employ for the protection of the tenants a more stringent measure of legislation than has been found necessary in the temporarily-settled areas."

7. It has permitted the creation of a number of intermediaries between the zamindar and the actual cultivator none of whom have either the incentive or the power to provide any effective means for improvement of agriculture. The Government also finds little inducement to spend public money on agricultural development, as the benefit of the improvement goes into private hands, with the result that improvement of agricultural land is nobody's concern.

8. The number of rent receivers is ever on the increase while there is a steady reduction in the number of cultivating owners of lands and the dispossessed cultivators are swelling the number of *bargadars* or of landless agricultural labourers.

9. The complexities of the existing system have led to an immense volume of harassing and expensive litigation between the landlords and tenants and in the privately-managed estates illegal collections still represent an appreciable addition to the burdens of the cultivators.

10. In permanently-settled areas it is virtually impossible to secure remission of rents in areas affected by drought, flood or other natural calamities.

11. So long as the zamindari system remains, it will be difficult to evolve any satisfactory arrangement for revising rents all over the Province on an equitable basis and for maintaining the records-of-rights. It is also doubtful if under the existing system, the Legislature would ever agree to provide a really efficient machinery for realization of rent with the result that arrear rents would go on accumulating and there will be a complete breakdown before long. The stability and security of the land system has already been threatened by the development of no-rent mentality amongst the *ryots* in certain areas.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS.

[Figures in brackets refer to pages.]

INTRODUCTION

The terms of reference to the Commission are as follows:—

To investigate and report to the Central Government upon the causes of the food shortage and subsequent epidemics in India, and in particular in Bengal, in the year 1943, and to make recommendations as to the prevention of their recurrence, with special reference to—

(*a*) the possibility of improving the diet of the people and the quality and yield of food crops, and

(*b*) the possibility of improving the system of administration in respect of the supply and distribution of food, the provision of emergent medical relief and the emergent arrangements for the control of epidemics in famine conditions in those areas and in those aspects in which the present system may be found to have been unsatisfactory.

The matters referred to the Commision, in so far as they specially related to Bengal, have been dealt with in the first report entitled "Report on Bengal" published in May 1945. That report also dealt with the epidemics position in India as a whole and certain aspects of the food situation in India. The present report covers the remaining items of the terms of reference and is divided into four parts. The first part entitled "Short-term aspects of the food problem", contains a review of the food shortage in different parts of India during 1943 and is related to item (*b*) of the terms of reference. Item (*a*), viz., "the possibility of improving the diet of the people and the quality and yield of food crops", is, for practical purposes, co-extensive with the whole future development of the country, and the remaining three parts of this report are devoted to this item. The subject-matter is so wide, that many of the questions to which a single chapter has been devoted in the report, would in themselves almost provide scope for the enquiries of a Commission. It has, therefore, been found necessary, as regards many of the subjects discussed in the report, to attempt merely to state the problem rather than to solve it, to suggest general lines of approach and investigation rather than clear-cut schemes for immediate action. The main endeavour of the Commission has been to survey the problem as a whole and to define the broad lines of a food policy designed to prevent any future threat of famine and to improve the diet of the people.

PART I, CHAPTER I.

PART I.—SHORT-TERM ASPECTS OF THE FOOD PROBLEM

[3–10]

CHAPTER I.—FOOD SHORTAGES IN INDIA IN 1943

This chapter contains a review of the food situation in the provinces and certain states during 1943. The principal cereals, namely, rice, wheat, millets, barley and maize are considered. Before the war India as a whole was not self-sufficient in cereals, a small exportable surplus of wheat being offset by large imports of rice. Certain provinces, namely, the Punjab, the Central Provinces and Berar, Sind, Orissa and Assam are net exporters of cereals in normal times, while others, Bengal, Bihar, the United Provinces, Madras, Bombay and the North-West Frontier Province are normally importers. The available statistical information relating to the size of these surpluses and deficits is set out. In addition the effects of the loss of the imports from Burma and seasonal conditions on the supply position in 1943 are described. Finally the food problems which faced certain provincial and state administrations in 1943 and the measures taken to deal with them are explained.

PART I, CHAPTER II.

CHAPTER II.—THE GROW MORE FOOD CAMPAIGN

[11–25]

Paragraphs 1-11.

[11–20]

In April 1942, the Government of India summoned a Food Production Conference for the purpose of concerting measures to increase the production of foodgrains in India. The measures recommended were, first, an increase in the area under food and fodder crops by bringing new land, including fallow land, under cultivation, double cropping and the diversion of land from non-food to food crops; secondly, an increase in the supply of water for irrigation by the improvement and extension of existing irrigation canals, the construction of additional wells, etc.; thirdly, the extended use of manures and fertilizers; and fourthly, an increase in the supply of improved seed. The measures taken by the Central and Provincial Governments under each of these heads are reviewed. An account is also given of the effect of conditions created by the war on the supply of vegetables, cattle and agricultural implements.

Paragraph 12.

[20]

A statistical review of the production of cereals and pulses follows; the acreages and yields during the years 1942–43 and 1943–44 being compared with the averages for two preceding triennial periods.

Paragraph 13.

[24]

Attention is drawn to the great need for the improvement in the supply of supplementary foods. Beyond this no specific recommendation is made as regards the Grow More Food campaign except that it should be continued with undiminished vigour and without any slackening of effort.

ibid.

The results achieved by the Grow More Food campaign during the two years 1942–43 and 1943–44, have not been spectacular. This is not surprising. The area of culturable

but uncultivated land which can be brought under cultivation without the application of special, and in the majority of cases expensive, measures is small. The two main requisites for a large increase in agricultural production are, first, an improved water-supply and, secondly, an increase in the supply and use of manures and fertilizers. But schemes for an increase in the supply of water for irrigation take time to complete, particularly in conditions arising out of the war. Again, a large increase in the supply and use of manures and fertilizers presents many difficulties. The campaign has been seriously handicapped by the short supply of artificial fertilizers.

The lesson to be drawn from the experience of the Grow More Food campaign stands out clearly. It is this. A large increase in agricultural production in India by an extension of the area of cultivated land and an improvement in the yield per acre of crops through irrigation and other measures, will not be achieved without intensive and sustained effort on the part of both Government and the people. There is, therefore, need for laying down a clear agricultural policy and providing administrative machinery for its execution. Paragraph 18 [24]

CHAPTER III.—FOOD ADMINISTRATION IN INDIA DURING THE WAR.

PART I, CHAPTER III.

The foodgrains coming to the market in India consist of the individual small contributions of millions of small cultivators, and the problems confronting food administrations in India are, first, the control, directly or indirectly, of the flow of these innumerable small streams of grain and the larger streams into which they coalesce, in order to ensure the provision of supplies for the defence services, the urban population and those classes in the rural areas which buy their supplies, in whole or in part, from the market, and secondly, the equitable distribution of the available supplies among the latter two classes of consumers at or within pre-determined price levels. The procurement machinery for the maintenance of supplies of foodgrains in the different provinces does not conform to a uniform pattern. Conditions vary greatly throughout India and the adoption of a uniform procurement machinery would have been impracticable. The systems of procurement and distribution in force in different provinces of India are reviewed and the special problems presented by certain aspects of the prevailing systems discussed. The conclusions reached and recommendations made are as follows:— [26–43] Paragraph 1 [26] Paragraph 2 [26] Paragraphs 3-13 [26–31]

The only completely satisfactory system of procurement and distribution of foodgrains is one in which first, the whole of the surplus of every producer is at the disposal of Government, and secondly, the entire population is rationed. Such a system is described as one of " full monopoly." Paragraph 14 [31]

Paragraph 14 [32] Full monopoly schemes are in operation in parts of Madras and some of the Indian States. The " levy " scheme in operation in parts of the Bombay Presidency is also, for all practical purposes, a scheme of full monopoly.

Schemes of full monopoly are not a practical proposition in Bengal, Bihar, and the permanently-settled areas of Orissa and Assam. In areas which have an assured surplus, schemes of full monopoly are not necessary. In deficit areas in which internal distribution presents, or in the future may present serious difficulties, the administration should aim at the introduction of schemes of full monopoly.

ibid. [33]

Paragraph 15 [33] In Orissa and the Central Provinces and Berar, schemes are in operation which give Government a limited monopoly of purchase over the marketable surplus. In the report on Bengal it was recommended that the Bengal Government should study these schemes with a view to their introduction, modified if necessary to suit local conditions, as an experimental measure in a selected district or districts. It is suggested that the Bihar Government should also study these schemes with the object of strengthening their procurement machinery.

Paragraphs 16–17 [34–36] Storage is one of the most difficult problems with which food administrations in India are faced. Even in normal times a considerable quantity of foodgrains was lost through deterioration and the ravages of insects and rodent pests, and there is little doubt that, at present, when large quantities are handled by official agencies largely unfamiliar with the merchandizing of grain, losses are on a much higher scale. It is, therefore, essential that storage conditions should be improved and made insect and rat-proof. It is recommended that all administrations, which store grain on a considerable scale, should, as far as possible, place their storage branch in charge of a fully qualified technical officer assisted by the necessary technical staff.

Adequate storage, is also essential to successful procurement. The Government of India have recently embarked upon a scheme for the construction of storage for 230,000 tons of grain in surplus areas. In addition, it is proposed to provide additional storage for 120,000 tons of imported grain. It is recommended that the construction of this additional accommodation, particularly that for 100,000 tons in the Punjab, should be pushed forward as quickly as possible.

ibid. [36]

Paragraph 18 [36] The poor quality of grain distributed by the different administrations has often given rise to justifiable complaints. Although the position has improved, the grain distributed is still not infrequently of poor quality. The Government of India have recently set up an Inspection Directorate at the Centre and Inspection Departments have also been established in some provinces. The problem of quality will,

[5]

however, not be completely solved until there is in each province, whether surplus or deficit, a reliable agency competent to test and inspect all foodgrains brought into Government stock.

It is recommended that rationing should be extended in the Punjab to the four towns, with a population of over 100,000, which have not yet been rationed. Paragraph 19 [39]

Attention is drawn to the observations as regards requisitioning in the Report on Bengal. It is recommended that Governments should not hesitate to requisition from the large producer and the trader if grain is being held back by them from the market in order to raise prices. Paragraph 20 [39]

The general level of prices of foodgrains in India is high compared with the world level. Indian prices must fall when consumer goods become more plentiful and cheaper and imports of rice are once again available, but so long as the supply position of cereals remains as at present, prices generally speaking, will have to remain at about their present levels. If prices should fall substantially before imports of rice become available, production may suffer a setback. The present policy to hold prices at about their present levels till the supply position is easier is, therefore, the correct course to follow. Paragraphs 22–24 [39–41]

CHAPTER IV.—STATISTICS OF ACREAGE AND YIELD OF CROPS

PART I, CHAPTER IV, [44–50]

Problems arising out of the production and distribution of foodgrains during the war, have emphasized the need for accurate statistics of acreage and yield of crops; schemes are now in operation with the object of securing improvement in these statistics. Paragraph 1 [44]

For the determination of the acreage a plot to plot enumeration is preferred to a random sample survey, because the former can, whereas the latter cannot, give full and detailed information as regards the areas under different crops. Paragraph 8 [46]

In the "temporarily-settled provinces" the acreage figures are compiled by the subordinate revenue establishment by a plot to plot enumeration. In these provinces the acreage figures are on the whole accurate and it is recommended that the present system should continue. Paragraphs 2 and 8 [44 and 47]

In the "permanently-settled provinces" acreage figures, except in regard to jute in Bengal, are not accurate; they are not compiled by a plot to plot enumeration but are based upon reports received from local officers. In the provinces of Bengal, Bihar and Orissa, schemes have recently been introduced for the determination of acreage by a system of plot Paragraph 3 [44] Paragraphs 5–7 [45–46

to plot enumeration. In addition, in Bengal a scheme is in operation for the determination of the acreage under jute, *aus* paddy and *aman* paddy by the random sample survey method.

Paragraph 9 [47] It is considered that in the " permanently-settled provinces " the goal should be the determination of acreage by the method of plot to plot enumeration. It is pointed out that in order to ensure the accuracy of the estimates prepared by this method it is essential that (a) the plot to plot enumeration should be carried out by an adequate and efficient staff of primary enumerators and inspectors maintained on a permanent basis, and (*b*) the size of the primary reporting unit should not be too large.

Paragraph 10 [48] There is room for considerable improvement in the method of estimating yield per acre.

ibid. The random sample method is a scientific method of computing yields and the first matter to be decided is whether the adoption of this method is a practical proposition and whether it can fulfil completely administrative requirements. Random sample surveys of yield are now being carried out in Bengal by the Indian Statistical Institute and in other parts of India by the Imperial Council of Agricultural Research. The surveys in Bengal will be continued for a period of three years. It is suggested that the surveys by the Imperial Council of Agricultural Research should be continued for a similar period. A decision should then be reached in the light of experience gained as regards first, the technique to be followed in carrying out the random sample surveys, and secondly, the extent to which these surveys can be used in determining the yield per acre in a particular year. Until a decision has been reached on these points nothing will be gained by examining other methods of improving the present system.

Paragraph 11 [48] Every Director of Agriculture should be provided with a capable Statistical Assistant.

ibid. [49] A qualified statistical officer should be appointed at all provincial headquarters to whom should be entrusted the study of all aspects of economic and social progress in the province.

Paragraph 12 [49] For statistical purposes edible oil-seeds should be classified under the head " food crops ". Separate figures showing the acreage under potatoes, sweet potatoes and tapioca should be given in the " Agricultural Statistics for India."

CHAPTER V.—THE NEED FOR IMPORTS

PART I, CHAPTER V. [51–58]

Paragraph 1 [51] India, before the war, was not self-sufficient in foodgrains, a small exportable surplus of wheat being offset by large imports of rice.

Paragraphs 2 and 9 [51 and 54] Although the production of foodgrains has increased consumption has also increased, owing to the growth of population, a higher *per capita* consumption by the poorer classes of the population and the requirements of the defence services. India is still in need of imports.

Imports must consist mainly of wheat because rice is not available under conditions created by the war. Paragraph 10 [55]

The method now followed by the Government of India in estimating wheat requirements is considered suitable; it enables the volume of imports to be regulated in accordance with changes in the supply position in India. *ibid.* [56]

In agreement with the Foodgrains Policy Committee, it is considered that a Central reserve of 500,000 tons of foodgrains is essential. In present circumstances, such a reserve can only be built up from imports of wheat. Paragraph 11 [56]

CHAPTER VI.—FOOD ADMINISTRATION IN INDIA DURING THE IMMEDIATE POST-WAR PERIOD

PART I, CHAPTER VI. [59–69]

The process of relaxation of existing controls is bound to present difficult problems which require to be studied in advance, and preparations for their solution must be made before they arise. Paragraph 2 [59]

The return to normal conditions must be a gradual, regulated and co-ordinated process; otherwise the chaotic price and supply conditions which prevailed in many parts of the country in the summer of 1942 and during the greater part of 1943, may recur. *ibid.*

The permanent objectives of food policy have a bearing on the problems of the transition period and must be prominently kept in mind in considering these problems. Paragraph 3 60]

The organization of food administration during the transition period should be designed, not with a view to securing the most expeditious return to pre-war conditions, but so that it can evolve into a system of regulation of prices in normal times. *ibid.*

The transition period may be regarded as commencing with the arrival of the first shipments of rice from Burma in appreciable quantities. Its probable duration is unpredictable; it may last until 1951–52. Paragraph 5 [61]

During the first stage of the transition period, it should be possible to secure the diminution and eventual elimination of wide price disparities at present existing in different parts of the country. Paragraph 6 [61]

If the actual prices which prevailed during the quinquennium ending 1938–39 are worked out in each province, and a price in the neighbourhood of 240 per cent of such average determined, the result would broadly represent the target price level to be aimed at at the end of the first stage of the transition period. Paragraph 7 [62

Concurrently with the reduction of prices the more stringent forms of control should be withdrawn. Paragraph 8 [62]

The main problems of the second stage of the transition period would be the co-ordinated removal of cordons around Paragraph 9 [63]

provinces and states, and the re-transfer of the responsibility for distribution of supplies from Government agencies to the trade. At the same time, Governments must be prepared to re-introduce controls should this be necessary, and to ensure the maintenance of the price level within predetermined limits.

Paragraph 9 [63] Effective methods for preventing the price level from falling below a pre-determined minimum should be perfected at this time.

Paragraph 10 [63] During this stage the price level should not be allowed to exceed 240 per cent of the pre-war level, that is, the average of the quinquennium ending 1938–39, nor allowed to fall below 180 per cent of the pre-war level.

ibid. The maintenance of the suggested minimum level during the stage of the transition period is essential to the orderly development of the country's economy.

ibid. [64] It is only by setting before themselves in concrete terms a definite task to perform during the transition period, and actually solving the problems involved as they arise, that Governments will acquire the basis of practical experience on which a system of regulation of prices suitable for normal times can be devised and operated.

Paragraph 11 [64] A special need for regional co-ordination will arise in the circumstances of the transition period, and the establishment of Regional Food Councils consisting of representatives of the Governments of Provinces and States in each region is recommended.

ibid. The functions of Regional Food Councils should be to advise provincial and state administrations on the steps to be taken by them in order to secure, within the region, the co-ordinated removal of cordons, the maintenance of supplies through inter-Provincial and State trade, the execution of a common price policy for the region within the framework of an all-India price policy, and the fulfilment, in respect of the region, of the All-India Basic Plan.

Paragraphs 12 and 13. [64–66] The need also exists for the establishment of a permanent and recognized machinery for co-ordination of food administration at the Centre as well as in the Provinces and States.

Paragraphs 13–15 [66–67] A suitable model for such machinery already exists in the All-India Food Conferences. It is suggested that in the place of *ad hoc* conferences summoned at irregular intervals, a permanent organization should be established which may be called the ALL-INDIA FOOD COUNCIL.

ibid. [67] The All-India Food Council should be recognized, both by the Central Government and the Governments of Provinces and States, as the common organ of co-ordination of the activities of these Governments in framing and executing a common food policy for the country as a whole.

The existing organization of the Food Department at the Centre will have to continue during the immediate post-war period and to perform functions of substantially the same character as at present. Paragraph 16 [67]

It would be convenient in due course to constitute a single department at the Centre which would deal with both Food and Agriculture and whose functions would be limited to those two subjects only. *ibid.*

PART II.—POPULATION, NUTRITION AND FOOD POLICY

Part II, Chapter I. [73–104]

CHAPTER I.—POPULATION

The population of India has increased by about 30 per cent since 1872 and is now in the neighbourhood of 400 millions. The rate of increase has not been as rapid as in certain other countries. There is a general tendency for the excess of births over deaths to increase and great possibilities exist for further reduction in the death-rate by the development of public health services. Paragraphs 1-3 [73–75]

The reported net area under food crops per *capita* is about 0·72 acre. It appears that during the last 30–40 years the area under cultivation *per capita* has decreased. American experts have calculated that 1·2 acres *per capita* are required to produce an " emergency restricted diet " in the United States of America. Paragraphs 5 and 6 [77–80]

During the decade 1931 to 1941 the population of large cities increased more rapidly than the population as a whole. During the same decade, however, the non-urban population increased from 300 to 339 millions and its percentage to the total fell only from 88·9 to 87·2. Whatever the future prospects of industrial development, India is at the present time essentially a country of agriculturists. Paragraph 7. [81]

Analysis of the various factors concerned with population growth suggests that, in the absence of major calamities, the population will reach 500 millions in 20 or 25 years' time. Paragraphs 8-13 [82–87]

The food position in relation to population appears to be in certain respects less favourable than in 1880. There is, however, no fully satisfactory evidence that standards of nutrition have declined since that date. India, in relation to the existing stage of her industrial and economic development, is overpopulated, increasing pressure of population manifesting itself in various ways. On the other hand, the advance of science has opened up possibilities of increasing food production which did not exist sixty years ago. Paragraphs 15-18 [88–91]

Whatever success in increasing food production can be achieved, ultimately a decrease in the rate of population growth is not only desirable but necessary. While an addition of a further 100 millions to the population within the Paragraphs 19-21 [91–94]

next 25 years must be anticipated, the essential point is whether, when that figure is reached, the whole "reproductive situation," including the relation between the birth-rate and the death-rate, is favourable to continued growth at an equal or accelerated rate, or whether the population has reached, or is approaching, a position of stability.

Paragraph 22 [94] The course of population growth may be influenced by emigration, urbanization and family limitation. Emigration abroad has hitherto had little influence on population in India. It is, however, pointed out that the emigration of Indians as colonists to sparsely populated regions in the Commonwealth and the Empire, would serve the double purpose of relieving to some extent the pressure of population on land in India, and of facilitating the development of such regions.

Paragraph 23 [95] Experience in other countries indicates that urbanization is, for various reasons, associated with the slackening of population growth, and increasing urbanization in India may have a similar effect.

Paragraphs 24–26 [96–99] There is evidence that the practice of family limitation has appeared in this country, but it is as yet confined to the more prosperous classes. At the present time a deliberate State policy with the objective of encouraging the practice of birth control among the mass of the population is impracticable, both because of public opinion on this matter and because of the low economic condition of the poorer classes and their lack of education. A fall in the birth-rate will tend to follow rather than precede economic betterment.

Paragraphs 27 and 28 [99–101] Development of public health services may *in the long run* have a tendency to stabilize population. A high birth-rate accompanied by a high death-rate means waste of human effort and lives. It is suggested that an assault on infant mortality would ultimately tend to *reduce* the birth-rate. The State can legitimately take steps, through the medium of health services, which will have the effect of encouraging family limitation. Knowledge of birth-control could be imparted through maternity and child welfare centres, by women doctors, to women whose health would be endangered by further or excessive child-bearing, and also to women who seek advice because of a reasonable desire to "space" their children.

Paragraph 29 [101] The appointment of a Registrar-General to the Government of India and Registrars in the provinces, is recommended. Among their tasks would be the improvement of the registration of deaths and births, and the collection and scientific study of demographical data of various kinds.

Paragraphs 1 and 20 [73 and 92] While the fact that there is a serious population situation must be recognized, the primary problem is that of under-development of resources, both agricultural and

industrial. The belief is expressed that it is possible, by a variety of means, to produce not only enough food to meet the needs of the growing population at subsistence level, but enough to effect an improvement in the diet of the people. The magnitude of the task involved and its imperious necessity, are however strongly emphasized.

CHAPTER II.—THE PROBLEM OF NUTRITION

PART II, CHAPTER II. [105–112]

Among the poor sections of the community in India, both urban and rural, there is much under-nutrition as well as malnutrition. It has been estimated, by certain authorities, that 30 per cent of the population in normal times do not get enough to eat. Further, a large proportion of the population of India consumes a diet which does not contain protective foods in sufficient amounts. Paragraph 4 [106]

Much ill-health, disease and mortality in India, particularly among infants, children and women in the child-bearing period, is due to malnutrition. Diseases caused by or associated with insufficiency of some food factor or factors in the diet are of common occurrence. The improvement of nutrition is, therefore, an essential part of the public health programme in India. Paragraph 5 [108]

Steps should be taken to collect satisfactory records of standards of nutrition and physical development, with the object of obtaining a clear picture of their general trend from decade to decade in the future. Paragraph 6 [110]

A well balanced and satisfactory diet is beyond the means of large sections of the population. The poor man is forced, in order to satisfy hunger, to depend largely on the cheaper kinds of food. The lack of purchasing power is thus a most important, perhaps the most important, cause of malnutrition. Paragraph 7 [110]

The improvement of the diet of the people cannot be achieved without a great increase in the production of protective foods and simultaneous increase in purchasing power. Paragraph 8 [112]

CHAPTER III.—FOOD POLICY

PART II, CHAPTER III [113–125]

The existing food situation, the existing system of food administration and the results of the Grow More Food campaign have been dealt with in Part I of the report, the growth of population and the problem of nutrition have been discussed in Chapters I and II of this part (Part II). The results of the examination of the present position are briefly recapitulated as follows: The diet of the greater part of the population is unbalanced and does not contain enough protective foods. Within this majority group there is a considerable section, perhaps amounting to 30 per cent of the whole population, which Paragraph 1 [113]

does not get enough to eat, i.e., is short of both energy-yielding and protective foods. The poorer classes, both urban and rural, cannot afford to purchase a balanced diet even if protective foods were available in sufficient quantities. There is evidence of increasing pressure of population on existing land resources in various parts of the country and population is likely to increase by 100 millions in the next 25 years. At present the most widely consumed cereal, rice, is in short supply and the production of protective foods—pulses, meat, fish, fruits and vegetables—is quite insufficient. To offset this picture of the present state of affairs there are abundant opportunities for development in agriculture and other spheres which the growth of scientific knowledge and technology has opened up. Throughout the report strong emphasis is laid on these opportunities and it is considered that the resources of India, both agricultural and industrial, are, if vigorously developed, such as to remove any future threat of famine and decisively raise standards of living and nutrition.

In this central chapter which is linked with both the preceding and the following parts of the report, the outlines of future food policy are discussed.

Paragraph 2 [113-114]

The State should recognize its ultimate responsibility to provide enough food for all. This is enunciated as a broad principle, the implications of which emerge from the report as a whole. In India the problems of food supply and nutrition are fundamental and must at all time be one of the primary concerns of Central, Provincial and State Governments. It is abundantly clear that a policy of *laissez faire* in the matter of food supply and distribution will lead nowhere and would probably end in catastrophe. All the resources of Government must be brought to bear in order to achieve the end in view. This principle of State responsibility in the feeding of the people is in line with Recommendation 3 of the United Nations Conference on Food and Agriculture. Governments in India have within the last 100 years accepted the duty of preventing widespread death from famine. But the further obligation of taking every possible step not only to prevent starvation but improve nutrition and create a healthy and vigorous population has not yet been fully recognized and accepted.

Paragraphs 3–7 [114–118]

Cereals are the basic food of the people of India and the food situation which has arisen during the war has emphasized their importance. It is considered that self-sufficiency in cereals, at a satisfactory level of intake, should be one of the cardinal aims of food and agricultural policy. In putting forth this objective in regard to cereals, it is not proposed, however, that the producer should be compelled to grow cereals in preference to other food or non-food crops

except in an emergency such as that created by the present war. It is not considered necessary or desirable that an uneconomical diversion of cultivation from non-cereal crops to cereal crops should be compulsorily effected with the object of achieving self-sufficiency in cereals.

If agriculture is to develop and the agriculturist to prosper, the latter must be assured of a satisfactory price for the cereals he produces. The State must, therefore, determine from time to time the minimum prices of rice and wheat which are fair to the producer and maximum prices fair to the consumer, and ensure that prevailing prices fall within this range. Any repetition of the great slump of the thirties would be disastrous to India and will bring progress to a standstill. Strong emphasis is laid on this aspect of food policy. Paragraph 8 [118]

An increase in cereal production will not improve the diet of the people in respect of quality. Stress is, therefore, laid on the increased production of supplementary foods. Paragraphs 9–10 [119–120]

The question of the production of pulses and their supply requires detailed study, and that of increasing yields by the introduction of improved varieties, etc., demands the close attention of agricultural research workers and departments. Paragraph 11 [120]

Soya-bean is referred to. With the growth of industry in India its cultivation for industrial purposes may be called for. Soya-bean is a leguminous crop of value as fodder and in the rotation of crops and the part it could play for these purposes in Indian agriculture is worthy of investigation. With regard, however, to its use as a substitute for the common Indian pulses agreement is expressed with the views of the Nutrition Advisory Committee that, the nutritive value of soya-bean, in comparison with that of other common Indian pulses, is *not* such as to justify, from the standpoint of human nutrition, the immediate encouragement of its production and consumption on a wide scale in India. *Ibid.* [121]

A large increase in the supply of vegetables and fruits is needed and is considered perfectly feasible. Attention is drawn to a group of non-cereal foods, potatoes, sweet potatoes, tapioca and plantains, which have the characteristic of giving a higher calorie yield per unit area than cereals and pulses. These foods, however, are deficient in protein and if they are taken as the main ingredient in the diet protein intake is seriously reduced. The conclusion is that provided supplies of protein from pulses and fish can be simultaneously increased, an increase in the production of potatoes and sweet potatoes and plantains has much to recommend it from the standpoint of food and agricultural policy, with particular reference to economy in the use of land. As regards tapioca, Paragraph 12 [121]

the position is more doubtful; this root which is highly deficient in protein, tends to be eaten as a staple rather than as a supplementary food, replacing rice to an extent which is nutritionally undesirable. This question is considered in more detail in Chapter IX of Part III.

Paragraph 13 [122]

The intake of fats and oils is at present too low and an increase of the order of 200 to 250 per cent has been recommended on nutritional grounds. It is pointed out that increased production of oilseeds and their pressing in India will result in a greater supply of oils for human consumption.

Paragraph 15 [123]

The animal foods, milk, meat, fish and eggs, are prominent in the group of protective foods. Every effort must be made to increase the supplies of milk products and this is regarded as a most important aspect of food policy. But looking at the matter realistically, there appears to be no immediate prospect of the production of milk being increased to such an extent that it can be a regular article of diet consumed in adequate quantities by the poorer classes in the greater part of India.

Paragraph 16 [123-124]

Meat cannot be given a prominent place in the production programme. The same applies to eggs, an expensive article of diet beyond the means of the poor in most parts of the world. Poultry farming, however, should be vigorously developed in the neighbourhood of urban centres and the production of eggs as a subsidiary village occupation included in the programme of rural development. In Chapter XI of Part III great emphasis is laid on the need for an increase in the supply of fish. In many parts of the country fish should become the main protective food of animal origin in the diet of the masses.

Paragraph 17 [124]

The food production policy which is recommended is summed up as follows: Self-sufficiency in cereals as the basic food of the country should be a main objective. To balance cereals it is essential to increase the production of pulses, fish, vegetable oils, vegetables and fruits. Certain highly productive foods, notably potatoes, sweet potatoes and plantains, should be grown in greater quantities to relieve pressure on land and add to the total supply of calories. Supplies of milk and eggs should be increased as far as possible. If these objectives can be achieved, the national diet will be a reasonably satisfactory diet, compatible with much higher levels of health and physical development than those at present existing, even if milk, eggs and meat enter sparingly into the diet of the bulk of the population in many parts of the country.

Paragraph 18 [124]

Attention is drawn to the need for safeguarding the nutrition of vulnerable groups in the population. This question is discussed in Chapter XII of Part III.

The discovery of improved farming methods is of little value unless the cultivator can make use of them. Considerable attention, therefore, has been devoted in the latter part of the report to the question of land tenure, co-operation and agricultural economy generally. Paragraph 19 [125]

Improvement in diet and a rise in the standard of living are very nearly equivalent objectives. In order to increase agricultural production and improve the national diet, simultaneous industrial development to augment the total wealth of the country is essential. The growth of industry will itself help to solve some of the most thorny problems of village economy, such as excessive population pressure on land, rural unemployment, etc. Paragraph 20 [125]

The main lines of food policy are summarized as follows:— Paragraph 21 [125]

(i) Government responsibility for increasing food resources and improving the diet of the people.

(ii) Self-sufficiency in cereals.

(iii) Control of the price of cereals to ensure a reasonable return to the cultivator.

(iv) Increased production of certain protective and supplementary foods.

(v) The re-organization of agriculture.

(vi) The development of industry.

PART III.—IMPROVEMENT OF FOOD PRODUCTION AND NUTRITION

PART III, CHAPTER I. [129-143]

CHAPTER I.—IRRIGATION

Among the measures which may be adopted for increasing the area under cultivation and the yield of crops on land already under cultivation, the first place must be assigned to the supply and conservation of water. Paragraph 1 [129]

The construction by Government of all classes of irrigation works such as canals, multi-purpose reservoirs, tube wells and river pumping plant, should be undertaken as rapidly as possible in the post-war period. Paragraphs 2–5 [129-132]

In estimating the financial soundness of an irrigation scheme, account should be taken not only of the revenue directly attributable to the work in question, but also of the additional revenue indirectly accruing to Government, as a result of the increase in the wealth of the population. An irrigation scheme promotes the well-being and the standard of living of the people and there is, therefore, nothing intrinsically unsound in general revenues contributing to the loan charges of well considered schemes. Paragraph 6 [133]

Paragraphs 10 and 11 [135-137] The state should encourage the development of private wells by the collection of full information as regards sub-soil water supplies, the appointment of a special staff charged with the duty of advising and assisting the villager in the sinking of wells, the grant of *takavi* advances and the introduction of more efficient means of lifting water, especially in tracts with a deep water table.

Paragraph 12 [137] The construction of private tanks should also be encouraged.

Paragraph 13 [139] The legislative measures passed for the purpose of ensuring the proper maintenance of private irrigation works should be strictly enforced.

Paragraph 14 [140] The system of afforestation by contour trenching and the conservation of rain water by contour bunding holds out the prospect of effecting great improvements in agricultural conditions in large areas in Bombay and other parts of India, where the rainfall is not only precarious but is liable to be precipitated in violent storms of short duration. The work being carried out by the Bombay Government in this regard is commended to the notice of other Provincial and State Governments.

PART III, CHAPTER II. [144-150]

CHAPTER II.—MANURE

Paragraph 1 [144] A great increase in the use of manures and fertilizers is one of the most urgent requirements of Indian agriculture.

Paragraph 4 [145] Efforts to find an alternative fuel to cattle dung should be continued and intensified.

Paragraph 5 [146] The making of compost from nightsoil and town refuse should be continued and expanded.

Paragraph 6 [146] Investigations into the best methods of making compost from village refuse, cane trash, water hyacinth and other materials available in the country-side and the conservation of cattle urine should be continued and intensified.

Paragraph 7 [146] The question of crushing in India of as large a proportion as possible of the oilseeds grown in the country should be investigated.

Paragraph 8 [147] Further investigations into green manuring are necessary.

Paragraph 9 [147] The extended use of bonemeal, fish manure and slaughter-house refuse also needs examination.

Paragraph 10 [147-148] An expansion in the use of artificial fertilizers is essential if the yield of crops is to be substantially increased. The use of these fertilizers is, however, a technical subject on which much fuller information is required. Further research and experiment are necessary in order that Agricultural departments may be in a position to give full advice as regards the use of these fertilizers.

The price factor is a most important element in the use of organic and inorganic manures. While it is not recommended that the use of manures should be subsidized, it is suggested that the State should take other measures with a view to ensuring that manures are available to the cultivator at as low a price as possible. Paragraph 12 [149]

CHAPTER III.—IMPROVED VARIETIES

PART III, CHAPTER III [151-157]

Although considerable progress has been made in the evolution of improved strains of crops, work on the breeding of better varieties must continue with a view to effecting further improvement in the yield and quality and producing new resistant types. Paragraph 3 [152]

Most provinces have evolved a suitable system for the periodical renewal of improved seed. It is necessary, however, that the seed of improved varieties should be within easy reach of the cultivator and it is essential that he should not have to travel long distances to obtain it. The spread of improved varieties would be greatly assisted by the existence of a machinery by which the whole process of production and distribution, that is, the production of nucleus seed, its multiplication under carefully controlled conditions and its final distribution to the cultivator, became a well regulated procedure. Paragraph 4 [153-154]

New varieties with a wide range of adaptability are, in the long run, likely to prove more successful than narrowly specialized types. Paragraph 6 [154]

There is much confusion regarding different varieties and support is given to the proposal for a system of registration of all varieties of crops, including fruits and vegetables. *Ibid.*

The introduction of improved varieties must be accompanied by measures directed to improve the fertility of the soil if the best results are to be achieved. Paragraph 8 [156]

CHAPTER IV.—PROTECTION AGAINST PESTS AND DISEASES

PART III, CHAPTER IV [158-165]

If the full benefits of irrigation, manuring and improved varieties are to be assured, effective action must be taken to deal with diseases, pests, vermin and weeds. Crop protection is an important factor in increased production. Paragraph 2 [159]

The present cost of fungicides, insecticides, and fumigants, and appliances for dusting, spraying, and fumigation is high and beyond the means of most cultivators and fruit growers. The need for cheap fungicides, etc., and appliances is great and it is recommended that the question of producing cheaper chemicals and appliances be investigated. Paragraph 6 [161]

The control of pests of the staple crops such as rice, wheat, jowar, cotton and sugarcane can only be achieved by organized effort over wide areas. The staff available for such Paragraph [161]

control measures is very limited and it is proposed that a special plant protection staff should be employed in every province.

Paragraph 8 [162] With the increased use of organic manures, compost and green manure, termites may multiply and prove a serious menace. It is recommended that the termites problem should receive special attention.

Paragraph 9 [162] Fumigation of plants arriving in India from abroad is at present carried out by the customs authorities. It is recommended that this work should be entrusted to a special quarantine service consisting of trained personnel.

Paragraph 10 [162] To ensure quick and simultaneous action against pests and diseases a certain amount of compulsion is necessary. It is recommended that legislation be introduced in all provinces for the purpose of enforcing the adoption of prevention and control measures.

Paragraph 11 [162-163] It is suggested that the biological control of pests is a matter which requires further investigation and support is given to the proposal for the establishment of a biological research station.

Paragraph 12 [163] Attention is drawn to the loss caused through the deterioration of foodgrains during storage. It is recommended that the investigations now being conducted by the Storage Directorate of the Food Department of the Government of India and by the Imperial Council of Agricultural Research should be vigorously developed.

Paragraph 13 [163] Stress is placed upon the need for the eradication of deep-rooted weeds such as *kans, hariali,* etc., by means of tractor ploughing.

Paragraph 14 [164] Attention is drawn to the harm which is being done to agriculture by water hyacinth and lantana, and it is suggested that investigations into the eradication of these two noxious weeds should be continued.

PART III, CHAPTER V. [166-169] CHAPTER V.—AGRICULTURAL IMPLEMENTS AND MECHANIZATION.

Paragraph 1 [166] There is scope for further improvement in agricultural implements. It is suggested that progress would be assisted by first, the issue of an illustrated account of the implements and farm equipment in use in India, and secondly, the establishment of a central "museum" containing a collection of such implements.

Paragraphs 2 and 3 [166-167] One of the urgent needs of agriculture in India is a reduction in the enormous number of bullocks employed in farming operations. The substitution of bullock by mechanical power appears to offer the greatest possibility of effecting this reduction.

In addition to being employed for agricultural operations in the field, bullocks are also used for lifting water from wells, grinding corn and crushing oilseeds and sugarcane. Some progress has been made in the substitution of mechanical for bullock power in the latter operations. It is recommended that all possible measures be taken to encourage the use of mechanical power, particularly in areas where cheap electric power is (or will be) available, for these operations. Paragraph 4 [167]

Several Provincial and State Governments have placed orders for tractors for employment in areas infested with deep-rooted weeds and for the breaking up of new land. It is recommended that these tractors should also be utilized for conducting thorough and business-like investigations into the whole question of the substitution of mechanical for bullock power in farming operations. Paragraph 5 [168]

Small tractors of low horse-power are now available. It is recommended that experiments be carried out with this type of tractor with a view to evolving a design or designs suitable to conditions in India generally and in particular to the different conditions prevailing in different parts of the country. *ibid.*

CHAPTER VI.—MALARIA AND AGRICULTURE.

PART III, CHAPTER VI [170–175]

Malaria is widespread and seriously affects the efficiency of the rural population; it lowers the capacity for work of hundreds of thousands below that of a healthy individual. An agricultural community which is weakened in mind and body by malaria will never be a prosperous community. Paragraph 1 [170]

Malaria prevents large areas of fertile land from being brought under cultivation. Paragraph 2 [171]

A great deal of malaria is "man-made," produced by faulty irrigation works, faulty agricultural drainage, railway construction, etc. Much "man-made" malaria could be prevented by closer co-operation between engineers and malaria experts. Paragraph 6 [173]

The Public Health Departments of the provinces and the larger states should include a professional malariologist or a health officer trained in malaria control, a malaria engineer or a sanitary engineer with knowledge of anti-malaria work, an entomologist, a malaria agronomist, and trained field inspectors and laboratory assistants. Paragraph 7 [173]

Malaria control in rural areas is not an impossible proposition and further research may lead to the development of control methods cheaper and more effective than any yet evolved. Malaria control in general is essential to the satisfactory development of the country's agricultural resources. There is little excuse for the usual attitude of defeatism with regard to the problem. A most vigorous attack on both urban and rural malaria should be launched after the war. Paragraphs 9 and 11 [174 & 175]

PART III, CHAPTER VII [176–193]

CHAPTER VII.—ANIMAL HUSBANDRY

A.—LIVESTOCK

Paragraph 2 [177]

Importance is attached to the maintenance of livestock statistics and it is recommended that provinces and states should recognize their obligation to conduct quinquennial enumeration on a uniform basis.

Paragraphs 4 and 7 [178 & 179]

The number of stud and approved bulls is still far below requirements. Increased use should be made of improved and registered animals bred in the villages in selected breeding tracts. The development of artificial insemination may result in a decrease in the number of bulls required.

Paragraph 5 [178]

An enquiry should be undertaken into the best age for castration of inferior animals and every effort made to increase the castration of scrub bulls.

Paragraph 6 [179]

An investigation should be made with a view to increasing the milk yields of buffaloes.

Paragraph 9 [181]

It is essential that the best possible use be made of all grazing lands. Experiments should be undertaken, as soon as possible, in re-seeding, rotational grazing and manuring of grass lands.

ibid. [182]

Minor forests should be developed for the provision of grazing and fuel.

Paragraph 10 [182]

Green fodder crops are in serious short supply. Mixed farming holds out possibilities of increased production of human food as well as feed and fodder for cattle. The experiments now being conducted into mixed farming should be continued and extended.

Paragraph 13 [184]

The possibility of using the cow for work on the farm as well as for milk production is a matter worthy of investigation.

Paragraph 15 [185–186]

Research into the prevention and cure of disease should be expanded. The Veterinary Services in the provinces are inadequate and should be greatly strengthened.

B.—MILK

Paragraph 16 [186]

The average daily *per capita* consumption of milk in India has been variously estimated as 5·8 to 10 oz. Average intake is reasonably high in Sind and the Punjab, but in most parts of India is less than 4 oz. daily, which means that a large section of the population consumes no milk at all.

Paragraphs 16–19 [187–189]

The average milk yield of the Indian cow is very low. That of the she-buffalo is somewhat higher. The yields of both can be greatly increased by better feeding and management. Goat's milk amounts at present to only a small percentage of the total milk supply, but there are possibilities of increasing the importance of the goat as a source of milk.

Less than one-third of the total milk supply is sold and consumed in the form of fresh liquid milk. The milk-producer usually prepares *ghee* from his milk and sells it retaining the buttermilk or lassi for his own use. Producers in the neighbourhood of large urban areas can sell their milk in the fresh state, which is more profitable than the sale of *ghee*. Paragraph 20 [190]

The urban dairy industry has developed during recent decades, but in general, the supply of milk and milk products in towns and cities is insufficient to meet demand, and standards of purity and cleanliness are low. Much needs to be done to improve the supply, distribution and quality of milk in urban centres. A well-organized urban milk industry will stimulate production in the neighbourhood of such centres and lead to the introduction of higher-yielding breeds, and better feeding and management. *Ibid.* [191]

To increase milk supply, the essential requirement is more and better food for milking animals. The economics of milk production in the case of milch animals of different species should be investigated. Primary emphasis must be laid on the need for increasing the production and consumption of milk and milk products in the villages. Paragraph 21 [191]

CHAPTER VIII.—AGRICULTURAL RESEARCH AND ORGANIZATION

PART III. CHAPTER VIII [194–198]

There is urgent need for further research into the numerous problems on the solution of which the prosperity of the Indian farmer largely depends. For example, further research on the basic problems of soil fertility is imperative. Paragraph 2 [194]

Increasing facilities for research and the multiplication of research institutes will demand closer co-ordination and collaboration between research institutes and research workers. *Ibid.*

The capacity for first-class original research is rare and it is always difficult to find good men for senior research appointments. The development of research, therefore, should be sure but steady and a certain degree of "gradualness" in the extension of research institutes is to be advocated. Paragraph 3 [195]

The training of research workers is important. Facilities for post-graduate training of a worker before he is appointed to an agricultural research institute, are at present inadequate. This matter is brought to the attention of the Imperial Council of Agricultural Research. Paragraph 4 [195]

Support is given to the recommendation of Sir John Russell that the Imperial Council of Agricultural Research should set aside a small fund to assist senior men of approved merit to go overseas for training in research. *Ibid.*

Paragraph 5 [196] The important results of research in Indian agriculture should be compiled and published in a series of critical monographs,

Paragraph 6 [196] More work requires to be done on experimental farms in the direction of integrating proved results into suitable farm practices.

Paragraph 7 [197] A system of 'pilot' farms is recommended with the object of demonstrating the application of the results of research and improved farming methods to the cultivator.

Paragraph 8 [197] If agricultural production is to be largely increased, the administrative and field establishments in the provinces must be very considerably expanded. Agriculture must be recognized as one of the most important activities of Government and Agricultural Departments given a high priority in the allocation of funds.

PART III CHAPTER IX [199-207]

CHAPTER IX.—TUBERS AND OTHER HIGH-YIELDING CROPS

Paragraph 1 [199] It is essential to make the most profitable use of land resources. One method of achieving this is the increased production of potatoes, sweet potatoes, tapioca, and plantains which give larger returns of food energy or calories per unit area than cereals.

Paragraphs 3 and 4 [200–202] The potato, as a world source of food energy, is not far behind rice and wheat, while the sweet potato is an edible root of great importance in many of the warmer countries of the world. The area under potato in India is only about 0·5 million acres, but the areas climatically suitable for its cultivation are large. The area under sweet potato is not accurately known but is extensive and has increased considerably during the war.

Paragraph 5 [203] The extended cultivation of potatoes and sweet potatoes as supplementary foods should be one of the objectives of food policy. The sweet potato is, at present, consumed as a main article of diet in some areas in certain seasons of the year. Its use as a major ingredient in the diet as a substitute for cereals, is inadvisable since it may seriously reduce protein intake. The aim, therefore, should be to increase its production simultaneously with that of other foods richer in protein, such as cereals, pulses, fish, etc.

Paragraph 7 [204] Tapioca, the area under which has extended very considerably during the war in South-west India, has one serious disadvantage. It is a very poor source of protein. In normal times, therefore, the extension of tapioca growing should be encouraged, only if it is possible to ensure that it does not become the chief ingredient in the diet and that other foods richer in protein are consumed in sufficient quantities.

An increase in the production of plantains and bananas, for consumption as a supplementary food, particularly by children, should be included among the objectives of food policy. Parsgraph 8 [205]

CHAPTER X.—VEGETABLES AND FRUITS

PART III, CHAPTER X [208–216]

Vegetables help to balance and diversify monotonous cereal diets and fall into the category of "protective" foods. Many of the common Indian varieties of green leafy vegetables are excellent sources of pro-vitamin A—a vitaman for which the need is considerable, since ill-health and diseases associated with pro-vitamin A deficiency are of frequent occurrence among the poorer classes. Paragraph 1 [208]

The present intake of vegetables of all kinds by the mass of the population is inadequate and should be greatly increased. *Ibid.*

The cultivation of vegetables in villages, apart from those in the neighbourhood of cities, is very much neglected. Education and propaganda are required to teach the villager the value of vegetables as food, and to persuade him to grow them for his own use. The growing of vegetables in private gardens and allotments in urban areas should also be encouraged. Paragraph [208]

The vegetable farms started by the Provincial Governments in co-operation with the military authorities and by the military authorities themselves have considerably increased production. It is necessary that this increase in production should be maintained after the war. Paragraph [209]

The increased production of fruit is desirable from the point of view of nutrition and a greater consumption on the part of the poorer classes, the great majority of the population, would improve their present defective diet. Paragraph 7 [211]

As in the case of vegetables, the growing of fruit in villages, generally speaking, is neglected or under-developed. This is a matter which should be taken up by the agricultural and other departments concerned with rural development. The more fruit locally grown the better the diet of the people. Paragraph 8 [212]

India, with her wide range of climate and soil conditions, provides opportunities for the cultivation of nearly all the temperate, tropical, and sub-tropical fruits. *Ibid.*

While good varieties of all types of fruit exist, reliable agencies for their multiplication and distribution have not been organized. The position in many respects is the same as regards vegetable seeds. It is desirable that the growers of fruits and vegetables should have a guarantee, that the young trees and seeds they purchase are of good quality. It is suggested that, probably the best solution of this Paragraph 10 [213]

difficult problem would be for Agricultural departments to use every means in their power to encourage the establishment of "recognized" nurserymen for the production of young fruit trees and vegetable seeds.

Paragraphs 11 and 12 [213–214] Packing, transport and marketing are important factors connected with the development of fruit production. These matters require immediate attention.

Paragraph 13 [214] Stress is laid on the need for development of fruit preservation in its widest sense.

Paragraph 14 [214] A comprehensive and authoritative account of the fruits in India should be compiled and published, with the object of providing in a handy form information on the different fruits and the different aspects of the fruit industry.

PART III, CHAPTER XI [217–221]

CHAPTER XI.—FISHERIES

Paragraph 1 [217] In India, where the *per capita* intake of meat and milk is small, fish has special importance as a supplement to ill-balanced cereal diets; it must be given a prominent position in the "protective" group.

Ibid. The present supply of fish is totally inadequate; the development of fisheries is one of the most promising means of improving the diet of the people.

Paragraph 4 [218] Short-term programmes for the development of fisheries cannot yield results of permanent value unless they are supplemented by extensive long-term research programmes. Basic biological and ecological research is needed so that resources can be fully estimated, the most valuable fishing grounds discovered and charted and plans for development based on accurate knowledge of piscine distribution, migration and life history.

Ibid. Other kinds of research are also necessary. The whole problem of suitable fishing craft and tackle requires investigation. Extensive research is needed to improve inland fisheries. Communications, transport and marketing facilities must be studied and investigations made into the methods of preserving and processing fish.

The fish liver oil industry, initiated in Madras, should be placed on a firmer basis.

Paragraph 5 [219] The Government of India should undertake the responsibility of stimulating and co-ordinating the development of the fishing industry. The Indian Central Fish Committee and the Central Fishery Research Institute, proposed by the Fish Sub-Committee of the Policy Committee, No. 5, on Agriculture, Forestry and Fisheries, can fulfil many of the same functions in regard to fisheries as the Imperial Council of Agricultural Research does in the field of agricultural development.

The fishery departments of provinces and States, where such departments exist, have, in a majority of cases, accomplished little because of inadequate staff and resources and lack of scientific data. If progress is to be made, it is essential that Provincial Governments should have, not only a strong directorate including well-trained experts and the necessary research units, but also an adequate and efficient subordinate ground staff. Paragraph 6 [219]

The lack of trained workers of all grades is the most serious "bottleneck" to be circumvented. State scholars should be sent to the Torry Research Station, Aberdeen, to study the preservation and processing of fish and on their return employed in the provinces and States. It may also be necessary to employ a number of experts from abroad. Paragraph 7 [219]

There is also a great deal of work which can be done immediately to increase the supply of fish. An increased supply during the next few years is very desirable, in view of the present difficult food situation and the scarcity and high prices of protective foods generally. Paragraph 8 [220]

CHAPTER XII.—VARIOUS MEASURES FOR IMPROVING NUTRITION

PART III, CHAPTER XII [222–245]

Nutrition research in all its branches should receive ample encouragement and support. Paragraph 2 [222]

Specialised nutrition workers are needed in public health departments and to guide the activities of food departments in their nutritional aspects. Close contact between public health departments and food departments with regard to nutrition problems is necessary. Arrangements should be made for the education and training of more specialised nutrition workers for research and practical nutrition work. Paragraph 3 [223]

There should be a small technical all-India nutrition committee to which questions of nutrition policy can be referred. The existing Nutrition Advisory Committee of the Indian Research Fund Association is suitable in composition for this purpose. Paragraph 4 [224]

Methods of preventing deficiency diseases should be investigated and a vigorous attack on such diseases launched by public health authorities. Supervision of the diet of expectant and nursing mothers and infants is an important public health activity. This can be done through maternity and child-welfare centres which can supply not only advice but also dietary supplements, e.g., milk and vitamin preparations, when these are needed. The improvement of the diet of pre-school children is also of special importance. Paragraph 7 [227]

Paragraph 8 [228] Instruction in the subject of nutrition should be part of the normal training of professional groups which will be in a position to educate the public or those engaged in work in which knowledge of nutrition is of value. These include administrative officers in general, officers in food departments, doctors, nurses, school teachers and inspectors of schools, social and economic workers, workers in agricultural and animal husbandry departments, etc. The amount and kind of instruction will of course vary in the different groups. The medical profession is in a particularly good position to impart knowledge of nutrition to the public, and medical studies should be oriented so that greater emphasis is laid on this subject.

Paragraph 9–11 [229–230] The education of the public should be pushed forward by all available means, though it is useless urging people to eat what is not available and what they cannot afford. Visual and verbal propaganda must be reinforced by practical demonstration. Women are particularly suited for carrying on educational work in the sphere of nutrition. All children should be taught simple facts about food and diet, as part of health education.

Paragraphs 12–13 [230–232] Cereals form the bulk of Indian diets, and hence the treatment which they receive before consumption and its effect on their nutritive value are important questions. Most wheat is consumed in the form of *atta* which possesses most of the nutritive qualities of whole wheat. Barley, maize and the millets are eaten " whole " or nearly so. Highly-milled raw rice lacks certain important vitamins and its consumption as a staple food, with little else in the diet, leads to danger of beri-beri. Most rice-eaters in India consume home-pounded rice, raw or parboiled, or machine-milled parboiled rice, and rice in this form retains most of the vitamins of the whole grain. There is a considerable area in north-east Madras where machine-milled raw rice is the staple food of the population and here beri-beri is a serious problem.

Paragraphs 14 and 15 [232–233] The present policy of limiting the degree to which rice is milled is in general justified and should not be abandoned when the food situation is easier. Attention is drawn to the very considerable loss of nutrients which occurs when rice is washed before household use. The method of preparing rice for consumption known as " conversion " should be given a trial in India.

Paragraphs 17–23 [234–237] The development of school-feeding is strongly advocated. Many children in primary and secondary schools in India are under and mal-nourished and in consequence cannot do their school work properly. School feeding on any considerable scale is expensive; its organization is by no means easy and special staff for the purpose would be needed in both urban and rural areas. The type of meal provided

must vary according to season and locality and should be considered in consultation with nutrition experts. Ideally the food or meal provided in schools should be such as to make up for quantitative and qualitative defects in the home diet, but almost any supplement which supplies additional calories is of value.

Industrial workers must be properly fed if they are to be healthy and efficient. An adequate wage related to the cost of food is essential to this end. The development of well-run industrial canteens would benefit both employers and workers. Reference is made to the possibility of creating Government restaurants which would supply cheap and well-balanced meals to urban workers of all kinds and play a part in the educational campaign for improved diet. Paragraphs 24–28 [238–240]

A well-developed food industry, concerned with food processing in general, would provide a steady market for various food products, facilitate the storage and distribution of perishable foods, enable full advantage to be taken of seasonal abundance, and help to fill gaps in the supply of various kinds of foods in areas and seasons in which there is a shortage. The growth of food industry would have the general effect of introducing more efficient methods for the storage, transport and distribution of food. The greater production of shark-liver oil and vitamin A preparations from such oil is recommended, as also the manufacture of " food yeast " and synthetic vitamins. It is, however, pointed out that the development of a food industry and production of vitamin-rich substances and synthetic vitamins would leave basic problems of nutrition and food supply unsolved, and must be regarded as being of somewhat secondary importance in relation to these problems. Paragraphs 29-31 [240–241]

The control of the quality of foods in the broadest sense of the term is an essential part of a progressive food policy. Paragraph 32 [243]

PART IV.—IMPROVEMENT OF AGRICULTURAL ECONOMY

Part IV, Chapter I [249–284]

CHAPTER I—LAND TENURE PROBLEMS

A.—Preliminary

In Part III of this report the possibilities of developing agricultural production by the application of scientific knowledge and technical resources have been examined. The mere existence of technical possibilities is not sufficient; they must be realized. Are the producers capable of the effort which is necessary? Have they the necessary resources? Are they suitably organized for co-operative effort? In other words, is agricultural production in the country generally organized so as to be capable of realising the technical possibilities of increased production? These questions are examined in this part of the report. Paragraph 1 [249]

Paragraphs 2 and 3. [249–250]

The organization of agricultural production depends to a large extent on the rights and obligations of holders of land, that is, on the prevailing land systems. These systems are examined in the first chapter of this part. The nature of the material considered by the Commission is described and it is explained that the views expressed should be treated as the tentative results of a preliminary survey. They are intended only to indicate the scope of some of the problems involved and the directions in which, it is believed, investigations should be directed to find appropriate solutions. The object is to bring out prominently the existence of certain problems, and to recommend that Provincial Governments concerned should accept, in principle, the need for undertaking an examination of them. Such an examination should be based on investigations of local conditions and it is recommended that they should be undertaken in all provinces on a comprehensive basis.

B.—Land systems

Paragraph 4 [251]

Land is held in most parts of India under one or other of three systems. These are the permanently settled estate system, the temporarily settled estate system, and the ryotwari system. There are also a number of minor systems in different parts of the country.

Paragraphs 5–9 [251–253]

A brief account is given of the salient features of the three major systems. It is pointed out that the problems requiring investigation may be classified under three heads:—

(*i*) *Size of holdings, subdivision and fragmentation.*—It is well known that a large proportion of land is held in small holdings. There exists a tendency, directly relatable to the rights of inheritance and the transfer of land which, through subdivision, causes a progressive diminution in the size of holdings and their fragmentation; the need for legislative and administrative action in relation to this tendency is a matter for examination. This applies to all the different land systems.

(*ii*) *Occupancy-right-holder and non-occupancy-tenant.*—Another class of problems is the tendency for land to be held by occupancy-right-holders who do not attend to its efficient cultivation, and who lease such lands to tenants on terms which inhibit such cultivation. This again, is a matter for examination in respect of all the different land systems.

(*iii*) *The permanently settled estate system.*—There is a growing body of opinion that, apart from the defects already referred to, which are common to all the systems, there are defects peculiar to the permanently settled estate system which make it desirable that the system should be abolished and the ryotwari system introduced in its place.

In succeeding sections of this chapter, these three classes of problems are taken up for separate discussion.

C.—Size of holdings: subdivision and fragmentation

Measures for increasing the productivity of the land must be based on full and accurate information as to how land is held and how it is cultivated. At present, the statistical information available about "holdings" (the land in which a person has a permanent and heritable right of occupancy) is generally incomplete and practically no information is available about "farms" (the land actually cultivated by one person). Paragraph 11 [254

It is recommended that the existing system of records and returns should be reviewed and revised in such a manner as would enable the publication of a statistical abstract by every province giving particulars, such as the numbers, extent, etc., in respect of different classes of holdings and farms. Paragraph 7 [264]

Under all the land systems in the country small holdings are the rule and medium and large holdings are relatively few in number; the number of small holdings is increasing. The immediate cause of the progressive diminution in the size of holdings is subdivision. Paragraphs 10–16 [253–258]

Apart from measures designed to bring more land under cultivation and to increase industrial employment, no practical suggestion has been put forward for the prevention of subdivision without interfering with the laws of inheritance. A change in the laws of inheritance is not recommended. One member (Sri Manilal Nanavati), however, takes the view that such a change is necessary, and that if public opinion cannot be reconciled to it, the right of partition should be limited by prescribing the minimum size of a holding. The other members are not in favour of the latter proposal. Paragraphs 17–22 [258–261]

The manner in which subdivision is effected leads to a progressive increase in the fragmentation of holdings. The remedy for the evil of fragmentation is the consolidation of holdings on the lines undertaken with success in the Punjab and the Central Provinces. It is recommended that consolidation should be actively undertaken in other provinces. Paragraphs 23–25 [261–262]

The areas in each province where fragmentation is a serious problem should be located by a special enquiry, and taken up first for consolidation operations. In order to facilitate such operations, stamp duties and registration charges should be remitted and fees for encumbrance certificates waived. Paragraph 25 [263]

Some limitation on the existing rights of unrestricted transfer is necessary and desirable in order to prevent increase in fragmentation. The possibility of introducing a system of pre-emption which would secure this result is suggested for consideration by the Provincial Governments. Paragraph 26 [263]

D.—The occupancy-right-holder and the non-occupancy tenant

Paragraph 29 [265] The terms on which land is let by occupancy-right-holders to non-occupancy tenants are material factors in determining the efficiency of agricultural production.

Paragraph 40 [271] It is desirable, in principle, that the terms of tenancy should be such that either the occupancy-right-holder provides the facilities necessary for efficient cultivation, or the non-occupancy tenant holds on conditions as to duration of tenancy and rent which provide adequate incentive for efficient cultivation.

ibid. Whether or not the tenancy conditions actually prevailing in any tract are a handicap to an increase in agricultural production should be carefully investigated. Such investigation is recommended.

Paragraph 44 [272] The formulation of suitable remedial measures will depend on the results of investigation. The possibility of improving tenancy conditions through the spread of co-operation among farmers and the development of the principle of collective bargaining supplemented by arbitration, deserves to be examined.

Paragraph 45 [273] It should be recognized that occupancy-right-holders, particularly large landholders, have a duty to manage their lands to the best advantage and improve their productivity. The organization of large landholders in agricultural associations with the aim, among others, of improving the standard of cultivation is desirable. The methods by which the formation of such associations might be promoted and their activities stimulated and assisted by local officials, should be studied.

Paragraphs 41–43 [271–272] One member (Sir Manilal Nanavati) considers that the crop-sharing system should be abolished by legislation; that the State should undertake the acquisition of land from large landholders for re-sale on reasonable terms to landless cultivators and small holders; or, in the alternative, that tenancy legislation should be undertaken with a view to fixing cash rents for lands held on the crop-sharing system and conferring occupancy rights on the tenants. The Commission do not agree with these proposals, for reasons explained in the report.

E.—The permanently settled estate system

Paragraph 50 [275] The programme of rural economic development which has to be undertaken in the immediate post-war period will encounter special difficulties in those areas where the permanently settled estate system prevails.

ibid. [276] A comprehensive enquiry into the permanently settled estate system has been carried out in Bengal. It is necessary

that enquiries should be undertaken in those provisions (other than Bengal) where the system prevails, and such enquiries should be directed to the following points:—

(*a*) What are the specific defects of the permanently settled estate system as actually functioning in the province, as distinguished from those defects which are common to all the land systems in the country; and to what extent do they present difficulties in the way of improving agricultural production and increasing the standard of life of the cultivating classes?

(*b*) What measures should be undertaken, as long as the system continues, in order to remedy the defects and remove the difficulties in question?

(*c*) What are the financial and administrative implications of the acquisition by Government of interests intermediate between the ryot and the Government and the introduction of a ryotwari system?

On the basis of the results of such enquiries, a definite policy should be formulated in relation to the future of the system. The further conclusions which follow are put forward as tentative results of a preliminary study of the subject, to be taken into consideration when the enquiries recommended are made. Paragraph 50 [276]

Having regard to its financial and administrative implications, it appears unlikely that the replacement of the permanently settled estate system by the ryotwari system will be carried out within a relatively short period. There is, therefore, need for ensuring that the system functions properly as long as it continues. Paragraph 51 [277]

The more important features of a policy of reform are discussed. Such a policy cannot be implemented and the defects of the system cannot be removed unless Government assumes powers of supervision and control over the management of estates. The assumption of such powers is justified in the public interest. If a policy of reform of the permanently settled estate system is undertaken, it would require the enactment of legislation conferring power on Government to prescribe the standard of management which proprietors of estates should be required to maintain, and empowering administrative authorities to exercise such functions as may be necessary to secure it. The law would have to provide sanctions against non-fulfilment of obligations thus laid on proprietors. The standard of management referred to should include in particular, first, an adequate system of records and accounts and the employment of personnel qualified to maintain them; secondly, the adequate maintenance of irrigation sources; thirdly, the localization of cases where the existing rent exceeds a prescribed legal Paragraphs 58–59 [281–282]

maximum and the reduction of rents in such cases; and, fourthly, the annual allocation of funds (the amount of which would be fixed with reference to the resources of the estate) to be utilized for specific purposes (laid down by law) in furtherance of rural development.

Paragraphs 60–61 [282–283]

A policy of reform is likely to meet with special difficulties in areas where sub-infeudation prevails. In such cases, suitable methods would have to be devised for giving effect to the principle of " one estate, one proprietor ".

Where the subdivision and fragmentation of estates have already gone far, " uneconomic estates " would present a problem which may have to be solved by either acquisition or compulsory amalgamation.

One member (Sir Manilal Nanavati) is not in agreement with these views, and, in a dissenting minute, recommends the early abolition of the permanently settled estate system.

PART IV, CHAPTER II. [285–313]

CHAPTER II.—OTHER RURAL ECONOMIC PROBLEMS

A.—AGRICULTURAL PRICES

Paragraph 1 [285]

The maintenance of agricultural prices at a reasonable level is a factor of fundamental importance in agricultural economy.

Paragraph 2 [286]

The United Nations Conference on Food and Agriculture accepted the principle involved in the above proposition and made a recommendation on the action required on an international plane, for giving effect to it.

Paragraph 4 [288]

A scheme for the regulation of agricultural prices must be based on a full examination of all aspects of the complex problem. A sub-committee of the Policy Committee on Agriculture, Forestry and Fisheries, is, at present, engaged on such an examination. Attention is, therefore, directed in this section to the lessons to be drawn from measures taken during the war to control the food situation in India.

Parapraph 5 [288]

The first point stressed is the importance of the prices of food crops, as compared with other agricultural prices, in the economy of the country.

Paragraph 6 [289]

The second point emphasized is the importance of the prices of wheat and rice as compared with the prices of other cereals and non-cereal food crops.

Paragraph 7 [289]

The hard core of the problem of stabilization of agricultural prices is, therefore, the stabilization of rice and wheat prices. It is accordingly recommended that a policy of stabilization of the prices of wheat and rice should be adopted irrespective of any action in respect of other commodities.

Paragraph 8 [290]

Importance is attached to the recommendations made in Chapter VI of Part I in regard to the fixation of maximum and minimum prices during the transition period after the

war and the measures to be taken for keeping prices within those limits. During this period the essential requisites for price control, viz., control of imports, the existence of buffer stocks and an organization for making purchases and sales in the market, would all be in existence.

It is considered that experience gained during the transition period will provide data for determining the upper and lower limits within which prices should be maintained in subsequent years, and will indicate the measures to be taken for maintaining prices within those limits. Paragraph 8 [290]

One member (Sir Manilal Nanavati) considers that the full benefit of price stabilization cannot be realized unless it is accompanied by measures of land reform. The other members take the view that the issues relating to stabilization of prices should be decided independently of the reform of the land system. Paragraph 10 [290]

B.—Rural credit

We consider it necessary (*a*) that moneylenders should be licensed, (*b*) that the reciprocal obligations of the lender and the borrower should be regulated by law in such matters as the interest chargeable for different types of transactions, the maintenance of proper accounts, the periodical settlement of accounts, etc., and (*c*) that adequate machinery should be established for administering the licensing system and reviewing the effect of regulation, with a view to continuous improvement of rural credit facilities. Paragraph 17 [297]

In order to secure the foregoing, we recommend the adoption of legislation, on the lines in force in the Punjab, by all provinces which have not already undertaken such legislation. *ibid.*

Efforts to link moneylenders and indigenous bankers with the banking structure of the country have made little progress. The possibilities of removing the difficulties hitherto encountered should be further explored by the Reserve Bank in consultation with Provincial Governments. Paragraph 18 [297]

As a result of high prices of agricultural produce, there has been a substantial reduction in agricultural indebtedness. This appears to be particularly true of cultivators with large holdings and a considerable proportion of those possessing medium holdings. It appears probable, however, that the indebtedness of small holders may not have been reduced substantially in many parts of the country. Paragraphs 22–23. [299–300]

It is no longer necessary, nor in the public interest, that the expedient of the compulsory scaling down of debts should be repeated. The lesson to be drawn from debt relief legislation undertaken in the past decade is that the conditions which made it inevitable, should not be permitted to arise again, that is, a stable price level for agricultural produce should be ensured. Paragraph 25 (i). [301]

Paragraph 25 (ii). [301] Land mortgage banks should be developed in all provinces with the object of providing long-term credit, not only for the redemption of old debts, but also for land improvement and the introduction of better methods of cultivation.

Paragraph 25 (iii). [301] The savings campaign undertaken during the war should be continued and intensified during the immediate post-war period.

ibid. Educative propaganda should be undertaken, and where necessary and feasible legislation also, in order to check social customs which compel individuals to incur expenditure beyond their means.

C.—Rural employment

Paragraphs 27-30. [302–304] Perhaps the most important of all rural economic problems is under-employment. Its solution is to be found in a combination of the following measures: (a) intensive farming, (b) cottage industry, (c) agro-industry, (d) village public works, (e) internal migration and (f) large-scale industry.

Paragraph 31 [304] Intensive farming involves the adoption of various measures for increasing yields such as irrigation, manuring, the use of improved seed, etc. It also includes the practice of mixed farming.

Paragraph 33 [305] The most important cottage industry is handloom weaving. Efforts made to extend and improve this industry have been attended with some success ; they should be continued and extended. There is scope for the development of many other cottage industries; the efforts so far made have not, however, produced any striking results.

Paragraph 34 [305] The organization of co-operative societies for the development of cottage industries presents more difficulty in the case of agriculturists than of artisans. It appears probable that subsidiary employment for agriculturists can be organized co-operatively only if such organization is regarded as a subsidiary function of multi-purpose co-operative societies the main function of which would be to assist the cultivator in the production and marketing of agricultural produce. Until such multi-purpose societies are formed it is suggested that every endeavour should be made to utilize the services of those local dealers who are willing to co-operate with Government in the development of cottage industries.

ibid. [306] Attention is drawn to the success achieved in some areas by " rural reconstruction centres " developed by missionary organizations and such bodies as the All-India Village Industries Association. The question of how such centres can most efficiently contribute to rural development needs more careful attention and study than it has yet received.

By 'agro-industry' is meant the type of industrial undertaking, not cottage industry, which is specially suitable for development in rural areas. Emphasis is laid on the benefits which would accrue from the establishment in such areas of factories for the processing of farm products and working in association with large holders of land and co-operative societies representative of small holders. Attention is drawn to the success achieved in this direction on a large estate in the Bombay Presidency. Paragraphs 35-39. [307-309]

Village works of improvement can also make a contribution to the relief of under-employment by providing work in the season when agricultural operations are not in progress. The conditions necessary for the successful organization of village public works are first, the establishment of a *panchayat* for each village or group of villages with powers to raise money by taxation; secondly, a system of grants-in-aid from public revenues towards the cost of village improvements; and thirdly, the execution of such improvements by the *panchayats* subject to supervision by Government, District Board or Local Board officials. Paragraphs 40 and 41. [309-310]

Attention is drawn to the problems involved in internal migration from over-populated to under-populated rural areas. During the post-war period considerable areas of new land will be brought under cultivation by the efforts of the State and it is suggested that Governments should direct their attention to preparing schemes for the colonization of these areas. Provinces and states in which there are areas suitable for colonization, should be ready to accept immigrants from the densely populated parts of the country. Paragraph 43 [311]

The pressure of population on land cannot be relieved entirely by intensive farming, cottage industry, agro-industry, village public works, and internal migration. The view is expressed that unless the numbers employed in industry are increased very considerably, efforts to raise the standard of living of the great mass of the population will labour under a severe handicap and may prove fruitless. Special attention is drawn to the development of hydro-electric power as an important factor in industrial development. Paragraph 44 [311]

CHAPTER III.—RURAL DEVELOPMENT ORGANIZATIONS

Part IV, Chapter III. [314-330]

Multi-purpose co-operation

The future development of agriculture in the case of small and medium farmers depends in considerable measure on the organization of these classes into multi-purpose village co-operative societies with unlimited liability, and the federation of such societies into multi-purpose co-operative unions with limited liability. Paragraph 10 [320]

Paragraph 11 [320] Each multi-purpose co-operative union should have an efficient manager. This is considered important for, progress in the early stages will depend largely on the manager's initiative and his influence with the people.

ibid. The manager should, preferably, be an agricultural graduate trained in the Co-operative Department. The post should carry an adequate salary and incumbents should be eligible for promotion to posts in the Co-operative Department.

ibid. [321] A union in the early years of its existence will probably not be able to meet the cost of a well-paid manager. A grant by Government towards this expenditure is considered fully justified.

ibid. Importance is attached to constant guidance and supervision by officers of the Co-operative Department.

Paragraph 13 [322] The organization of multi-purpose co-operative societies and unions on a large scale is a tremendous task. It is recommended that a beginning should be made by carrying out a survey of economic and social conditions in selected areas in each province, and by preparing on the basis of such a survey a plan of the improvements to be carried out by the joint efforts of a multi-purpose co-operative organization and Government agency.

Organization of large landholders and farm-workers

Paragraphs 15 and 16. [322–324] Large landholders (occupancy right-holders) should be encouraged to organize themselves into agricultural associations with the object of increasing the standard of cultivation of their members, and promoting the interests of agricultural industry as a whole.

Paragraph 17 [324] Farm workers should also be encouraged to organize themselves. A labourer enjoying a reasonable wage is likely to be a more efficient worker than one who is ill-paid, and it may be expected that an improvement in the living conditions of farm labourers would be accompanied by an increase in their efficiency and that this, in its turn, would result in increased production.

Rural Administration and Co-ordination

Paragraph 22 [326] The following proposals for the purpose of securing co-ordination of policy and administration in the field of development are commended for the consideration of Provincial Governments:—

(*a*) The establishment of a Development Committee of the Cabinet.

(*b*) The establishment of a Development Board consisting of Secretaries to Government in the Development Departments, together with the Secretary of the Finance Department.

(*c*) The co-ordination of all district development activities under a single administrative head, the District Officer.

The creation of provincial bureaux of statistics is recommended. Paragraph 23 [326]

The establishment of *panchayats* is considered indispensable for the development of rural areas, and it is recommended that they be established wherever they do not now exist. Paragraph 24 [327]

Panchayats should be encouraged to take an active part in the framing of schemes of development relating to their areas and in carrying out such schemes. To this end, it is recommended that there should be established in every *taluka* or other comparable unit of administration a Rural Development Advisory Council, consisting of the Presidents of the *panchayats* and the senior officers of the Development Departments working in the area. Paragraphs 25-26. [328-329]

CONCLUSION

The report concludes with an emphasis on the need for a new spirit on the part of the Governments and the people of India. The hope is expressed that, in her future development as an independent nation, India will find in her own tradition the vision and faith which will enable her to create a new life for her people. [331]

APPENDICES

These contain abstracts of material considered by the Commission on the following subjects:—

I.—Population.

II.—Land tenure problems.

III.—Rural credit and indebtedness.

IV.—Agricultural prices and wages.

V.—Rural industries and employment.

VI.—Rural development organizations.

The questionnaire framed and issued by the Commission is also included for general information.

QUESTIONNAIRE

I.—FOOD POSITION IN PROVINCES AND THE GROW MORE FOOD CAMPAIGN IN THE PRESENT AND THE IMMEDIATE FUTURE

SECTION I.—GENERAL FOOD POSITION OF THE PROVINCE

1. (i) Is the Province normally self-sufficient, surplus or deficit in respect of the principal foodgrains? The Commission would be glad to have statistical information as regards production and consumption requirements over a reasonably long period as well as the view of the Provincial Government as to the errors to which the figures are subject and the inferences to be drawn as to the real position.

(ii) The changes in the normal position during each of the last two years, the seasonal and other factors affecting such changes.

(iii) Imports into and export out of the Province. The normal sources of imports and destination of exports and the changes, if any, during the last two years.

2. *Prices and price control.*—Figures showing in some detail the normal pre-war level of prices in the Province and course of prices during the last two years. The factors which affected these movements. A review of the measures taken for control of price movements, the difficulties encountered and the results. The Commission would desire to have the views of the Provincial Government on the present position and immediate future prospects as regards the price level and the effectiveness of measures of control.

3. *Procurement, movement and distribution.*—A review of the measures undertaken and the organization employed in regard to procurement, movement and distribution of foodgrains in the Province together with figures showing the results achieved in the form of quantities procured from surplus areas month by month and distributed month by month to deficit districts in the Province, to rationed towns, to priority consumers, and also for export, if any, out of the Province. The Commission would like to have, in particular, the appreciation of the Provincial Government as to the extent to which such measures have been found effective as regards the following matters:—

(i) Control of speculative buying;

(ii) Elimination of competitive buying;

(iii) Control of movement and transport;

(iv) Prevention of hoarding by traders or householders;

(v) Inducing or compelling the cultivator to sell his surplus.

The Commission would be glad to have detailed information in regard to special schemes of procurement, if any, such as a graded levy of foodgrains from producers, with controlled distribution to non-producers; and an appreciation of the success which has attended these schemes.

4. *Foodgrains Control Order.*—The Commission would be glad to have information as regards the measures taken to enforce the provisions of the Foodgrains Control Order, including details of the staff employed and an appreciation of the success which has been obtained in the enforcement of that order.

5. *Rationing in urban areas.*—(i) A description of the scheme or schemes now in operation together with an account of any changes which experience has shown to be desirable.

(ii) The cities and towns which are now rationed and those which it is proposed to ration in the future.

6. *Agricultural statistics.*—The Commission would be glad to have information as regards the methods by which agricultural statistics are at present compiled, the nature of the errors to which they are subject and any measures which it is proposed to take with a view to their improvement.

Section II.—The Grow More Food Campaign

I. *General*—

1. Please describe in general terms the methods adopted in furtherance of Grow More Food Campaign in your Province.
2. Estimate their success. Is it possible to state the increase of production during the current and the last year attributable to Grow More Food Campaign?
3. Has any progress been made in the drawing up of a food production plan for the future? If so, please give details of the plan.

II. *Agricultural implements.*—Are there difficulties regarding maintenance and renewal of agricultural implements? If so, describe them and estimate their seriousness. State your minimum requirements of iron and steel for the Province and describe how the estimate is arrived at.

III. *Cattle.*—Is there a shortage of milch cattle and of cattle for agricultural operations? Is the shortage increasing or decreasing? Estimate its seriousness and describe steps taken to improve the position.

IV. *Manures*—

1. What steps have been taken to increase the use of oil cake as a manure for foodcrops? What success has been achieved; what difficulties have been experienced?
2. Does green manuring increase the yield of major foodcrop? If so, of what crops?
3. What was the quantity of green manure seeds distributed during the last two years and what is the programme for the next three years?
4. Have any steps been taken to utilize town refuse, nightsoil, vegetable waste material, etc., for purposes of manure? If so, what are the targets for the next three years?
5. Is any bonemeal produced in the Province and if so, in what quantities? What steps have been taken to utilize this manure for intensifying food production?
6. Is ammonium sulphate valuable as a manure on any of the major foodcrops? To what extent would this manure be used annually? At what price would it be remunerative to the grower to apply this manure to paddy?
7. Estimate your minimum requirements, if any, of fertilizers required from outside the Province, and describe how the estimate is arrived at.

V. *Improved seeds*—

1. What are the major foodgrain crops, both kharif and rabi, and what was the acreage under each in 1943?
2. What is the total quantity of seed required for each such crop?
3. Has the department produced improved strains of seed for all or any such crop?
4. What arrangements have been made for the production of improved seed?
5. What quantities of these improved seeds are proposed to be distributed to growers during each of the next three years and what area under each crop will they cover?
6. How long will it take to cover the entire area under any crop with improved seeds?
7. Would it be possible to cover at least one-third of the area under each crop with improved seeds by the end of the next year? What organization would be required for this purpose?
8. Is there any system of registered seed growers in the Province? If so, what premium is paid to them for multiplying the seed and what arrangements exist for ensuring the purity of seed multiplied by these growers?
9. How many departmental seed stores exist in the Province and what is their total capacity? How many will be needed to supply sufficient seed to cover at least one-third of the area under major foodcrops?

10. What incentive, if any, is necessary to induce the cultivators to take to improved seeds?

11. What arrangements are in force or are proposed to be taken for a periodical renewal of improved seed?

VI. *Irrigation*—

1. What is the acreage normally under irrigation—
   (*a*) from Government sources,
   (*b*) from private sources.

2. Have any new irrigation works been constructed or improvements to existing works carried out during 1942–43 and since. If so, what is the estimated additional acreage brought under irrigation?

3. Has any programme of execution of such works for the future been drawn up? If so, what is the additional acreage likely to be brought under irrigation during the next three years?

4. Have the possibilities of encouraging ryots to undertake minor works, such as, surface percolation wells, tube wells, small tanks, etc., been explored? If so, with what results?

VII. *Extension of cultivation*—

1. What is the extent of culturable but uncultivated land—
   (*a*) in the Province,
   (*b*) in each district?

2. Has any use been made of the powers vested in the Provincial Government to bring uncultivated land into cultivation?

3. If the answer is in the negative, is it proposed to utilize these powers for the purpose mentioned in 2?

4. Are there any statistics available which would enable the department to indicate where such lands are?

5. What are the difficulties in bringing such lands into cultivation and how is it proposed to get over these difficulties?

6. What is the area of such land which has been brought into cultivation during the last crop year and what steps have been taken to ensure that lands newly cultivated continue to remain under cultivation?

7. Has any monetary incentive been offered or recommended for bringing such lands into cultivation? How far has it been taken advantage of by the cultivator?

8. What is the extent of old fallows and what are the difficulties in bringing these old fallows into cultivation?

VIII. *Double cropping*—

1. Is double cropping practised in the Province and if so, to what extent?

2. Can double cropping be extended and if so, in what parts, for which crops and to what extent?

3. Has any effort been made to do this and if so, with what results?

4. What special facilities are required for further extension of double cropping? Will such facilities be readily available?

IX. *Non-food crops*—

1. What are the principal non-food crops (linseed, jute, cotton, etc.), and what is the total acreage under each?

2. Can land now placed under these crops be switched over to food-grain crops, if necessary by using rule 80-B of the Defence of India Rules?

X. *Intensive crops*—

(*a*) *Potatoes*—

(1) What is the acreage under potatoes and to what extent can this acreage be increased?

(2) What are the difficulties in expanding the area under potatoes?

(*b*) *Vegetables*—
Have any steps been taken to increase the cultivation of vegetables for the civil population? If so, with what results?

(*c*) Is sweet potato a suitable crop as supplementary food? Does it grow well in the Province? What is the yield?

(*d*) Is there any other crop that may be encouraged as a food crop?

XI. *Organization*—

1. What was the field staff of the Department of Agriculture up till the year 1942?
2. Has it been expanded since and if so, what is its present strength?
3. Is the expanded staff sufficient to undertake the "Grow More Food" Campaign? If not, what more staff is required and how is it proposed to secure this staff quickly in order to carry out any food production plan?
4. Have any steps been taken to intensify the training of subordinate staff, such as agricultural overseers or assistants and kamdars or maistris at the Provincial Agricultural College or Government experimental farms? If so, how many such men will be ready for work at the end of the next twelve months?

II.—LONG-TERM POLICY

Section I.—Famine and Food Shortage

1. Give brief accounts of the famines, if any, which have occurred in your Province during the forty years ending 1941–42.

2. Furnish the following particulars separately for the twenty-year period ending 1921–22 and the twenty-year period ending 1941–42.

(*a*) Areas affected by famine and the population of such areas (according to 1941 census).

(*b*) Total number of persons relieved during all the famines.

(*c*) Total cost of famine relief operations.

Compare and comment on the differences between the two periods in respect of the above particulars.

3. Specify the areas which continue to be liable to famine periodically and the population of such areas (according to 1941 census).

4. Having regard to local conditions in these areas, do you consider it possible (by development of irrigation, development of industries, or other measures) to eradicate famine from these areas? If so, describe such measures and estimate approximately their probable cost.

5. Apart from the areas referred to in question 3, are there other areas where failure of crops occurs periodically as a result of drought or floods, etc., causing distress not amounting to famine? If so, specify such areas, together with their population (according to 1941 census).

6. What are the relief measures, and preventive measures, if any, usually adopted by Government in these areas? Have they proved adequate? Can you suggest any other measures which you consider desirable and practicable?

7. (i) It is generally believed that even in normal times a section of the population is too poor to secure a sufficiency of foodgrains and is therefore underfed at least during certain parts of the year. Is this true of your province? If so, can you make a rough estimate of the numbers involved and the average period in a normal year during which they are underfed?

(ii) A well-balanced diet should contain, in addition to cereals, sufficient quantities of other foods, such as, pulses, milk, vegetables, etc. How far is the diet of the population adequate in this respect? What proportion consumes only an ill-balanced diet, which may or may not contain enough cereal grains to satisfy quantitative needs. What steps do you recommend should be taken in order to provide a more varied and balanced diet?

8. It has been suggested that the principle underlying famine relief should be extended and that Government should undertake even in normal times the obligation to provide food or purchasing power to all persons who are unable to secure food and who, if able-bodied, are willing to work. Do you agree with this view? If so, can you outline a scheme of organization of such relief, describing in particular the types of work which may be prescribed, and the agency by which relief may be administered efficiently and economically? Can you roughly estimate the probable average net cost per head per day of such relief?

9. (i) What are the industries subsidiary to agriculture in your province? Describe the efforts made by Government or other agencies to develop such industries during the 20 years ending 1941–42. Assess the results of such efforts from the point of view of provision of supplemental income to small cultivators and reduction of the numbers referred to in 7 above. What would you recommend as the most promising measures from this point of view?

(ii) Are the means of transport by—

(*a*) rail,

(*b*) road,

(*c*) inland waterways,

adequate to the needs of the agricultural population?

Section II.—Food Production

10. Furnish the following figures, namely:—

(i) the average area cultivated,

(ii) the average area under all foodgrains, and

(iii) the average area of culturable waste; during each of the two following periods, namely:—

(*a*) the quinquennium ending 1921–22, and

(*b*) the quinquennium ending 1941–42.

Compare the figures relating to the two periods and comment on the differences between them.

11. To what extent, if any, has cultivation encroached on lands required for pasture and fuel? Describe generally the possibilities of further extension of cultivation in your province after making due provision for pasture and fuel requirements and land required for other essential common purposes of villagers. Discuss in particular the possibilities of land reclamation including the reclamation of land (state the area) which has gone out of cultivation owing to salinity or water-logging consequent on irrigation. Can you make an approximate estimate of the increased extent under cultivation and increased yield of foodcrops which may be thus secured? Can you estimate roughly the probable average capital cost per acre of land reclamation in your province?

12. Furnish the following figures relating to irrigation sources belonging to or maintained by Government:—

(i) Average area under irrigation from such sources during the quinquennium ending 1921–22.

(ii) Total amount of expenditure incurred during the period of 20 years ending 1937–38 on—

(*a*) the construction of new irrigation works and improvement to old works,

(*b*) maintenance of old and new works,

(iii) average area under irrigation from such sources during the quinquennium ending 1941–42.

Describe briefly the nature of the new works and improvements referred to above.

13. (i) Describe the possibilities of further increasing irrigation in your province as the result of new works and improvements which can be carried out by Government.

(ii) Can you estimate approximately the probable average capital cost per acre of new irrigation in your province?

(iii) Can you estimate approximately the increased yield of foodcrops which can be thus secured?

14. (i) Furnish the following figures relating to sources of irrigation belonging to and maintained by zamindars and other landholders, ryots, etc.:—

(*a*) average area under irrigation during the quinquennium ending 1921–22, and

(*b*) average area under irrigation during the quinquennium ending 1941–42.

(ii) Comment on the above figures and describe the possibilities of increase of irrigation, under such sources and in particular small private tanks, ordinary wells, tubewells, etc. State and discuss the measures necessary to secure such increase.

(iii) Can you estimate approximately the increased yield of foodcrops which can be thus secured?

15. The technological possibilities of increasing the yield of foodcrops through the improvement of agricultural methods have been estimated as a result of expert investigation (*vide* Appendix):—

(i) Comment on these estimates of possible increases of outturn in relation to conditions in your province.

(ii) Enumerate the adverse factors which, in your opinion, prevent the cultivators of your province from realizing these possibilities and describe the measures which, in your opinion, are practicable and likely to remove the adverse factors or substantially diminish their ill effects.

(iii) What, in your opinion, is the increase of yield of foodcrops likely to be secured in your province by improvement of agricultural methods?

16. (i) What is the total increase of yield of foodcrops likely to be secured in your province as the result of extension of cultivation, increase of irrigation and adoption of improved agricultural methods (*vide* questions 11, 13, 14 and 15)..

(ii) What is the amount of cereals necessary for the province each year on the basis of an adequate ration and making provision for the growing population?

(iii) On the basis of such increased production and consumption would your province be self-sufficient in food or a net importer (if so, to what extent) or a net exporter (if so, to what extent)?

17. What is the present position as regards milk supplies? What steps are being taken to improve and increase milk supply by (*a*) improvement in breed, (*b*) increase in fodder supply and (*c*) marketing developments?

18. What is the position of the fishing industry, sea, river and other inland sources of supply? What steps have been taken to develop the industry during the last 10 years? What plans, if any, are being laid for future development?

Section III.—Agricultural Economy

19. During the economic depression of the early thirties, the agricultural classes were hard hit as a result of an unduly low level of prices of foodgrains. On the other hand, it has been found necessary, during recent years, to adopt various measures for preventing prices of foodgrains from raising too high and thereby causing serious hardship to the consumers. In view of this experience do you consider that Government should, in the future accept responsibility for maintaining, even in normal times a system of regulated prices for foodgrains? If so, discuss to what extent the various control measures at present in force and the system of supply and distribution developed recently, would have to be retained even in normal times. Outline a scheme of measures which, in your opinion, would constitute a workable system of regulated prices and ensure a fair minimum price for the agriculturist and fair maximum for the consumer and prevent undue fluctuations.

20. How have agricultural wages risen in comparison with the prices of foodgrains during the war? Do you expect wages would adjust themselves to a system of regulated prices in normal times or do you consider special measures would be necessary to secure such adjustment?

21. Describe the more important agencies which at present finance agricultural operations. Comment on their usefulness.

22. Has an estimate been made of the agricultural indebtedness in your province before the war? Can you assess to what extent, if any, this has been reduced as a result of rise in prices of agricultural products during recent years? Have saving habits been developed?

23. Are there any restrictions placed in your province on the operation of the money-lender in order to protect the interests of the cultivating classes? Describe the nature of such restrictions and assess their results.

24. Describe the various systems of land tenure prevalent in your province. State the extent of land held under each of these systems.

25. The view has been expressed that unless changes are made in the prevalent systems of land tenure, it would not be possible to secure any significant increase in agricultural production or significant improvement of the standard of life of the cultivating classes. Do you agree with this view? If so, discuss in relation to each system of land tenure prevalent in your province, those aspects which, in your opinion, are objectionable as tending (*a*) to prevent extension of cultivation or irrigation or (*b*) to prevent the adoption of improved methods of agriculture or (*c*) to prevent the cultivator from securing a fair return for his labour and enterprise. Outline the changes which you consider necessary and the measures by which such changes can be brought about.

26. To what extent was there a tendency for ownership of land to pass out of the hands of cultivating classes to non-cultivating classes? Has this tendency been arrested or reversed to any significant extent?

27. Is absentee ownership of land increasing? If so, do you consider it to be a factor restricting the growth of agricultural production? Have any remedies been tried and with what results? Can you suggest any remedies?

28. Are the cultivating classes rackrented in any areas of your province? Have any remedies been tried? If so, with what results? Can you suggest any remedies?

29. (i) Is there a tendency to progressive reduction in the average size of holdings and/or their fragmentation?

(ii) Have any measures been adopted to restrict subdivision of holdings, if so, with what results?

(iii) Have any measures been adopted to promote consolidation of holdings, if so, with what results?

(iv) What measures would you recommend for securing improvement in these respects?

30. The view has been often expressed that individual holders of land cannot achieve any material increase in production or improvement of their standard of life unless they are organized for the purpose, e.g., on some kind of collective basis. Do you agree with this view? Describe the extent to which co-operative societies, panchayats, or other organizations are at present functioning, in rural areas of your province. Assess their adequacy or usefulness for the purpose stated above. If you consider them inadequate or inefficient, can you outline practical methods of constituting some form of village organization which would efficiently secure the purpose in view?

31. Specify the areas, if any, in your province, which are at present under-populated? Are they suitable for settlement by immigrants, from over-populated areas? Discuss the possibilities of such settlement, the difficulties involved and the measures necessary for overcoming them.

32. Having regard to the present size of the population of your province and its potential growth and having regard also to the present and potential resources of your province, are you convinced that measures should be now undertaken for securing a limitation of the rate of increase of the population? If so, state and discuss the measures you would recommend for the purpose.

APPENDIX TO THE QUESTIONNAIRE (VIDE QUESTION 15).

Rice.—The average outturn of paddy per acre during the last five years was 1,109 lb. or 738 lb. rice. Dr. Burns considers that, at a conservative estimate, these yields can be increased by 30 per cent, viz., 5 per cent by using improved varieties, 20 per cent by increasing manure, 5 per cent by protection from pests and diseases. There should even be no difficulty in increasing the present average outturn by 50 per cent, viz., 10 per cent by variety and 40 per cent by manuring.

Thirty per cent of 738 lb. would mean an average outturn of 959 lb. per acre for all-India. He concludes by saying that India should aim at an average of 1,000 lb. of rice per acre.

Wheat.—For the last 30 years, the average outturn of wheat in India is calculated to be 707 lb. per acre and, during the last 10 years 640 lb. per acre. Dr. Burns considers that, if only improved varieties are sown, manures applied in the light of results obtained and diseases controlled, it should be possible to aim at an average yield of 1,200 lb. per acre for irrigated wheat and 600 lb. for barani. The standard yields in the Punjab are 967 lb. for irrigated wheat and 572 lb. for unirrigated with an all-over yield of 738 lb. whereas, in the United Provinces, they are 1,200, 800 and 786 lb., respectively.

Jowar.—Average yields at present obtained are: irrigated 1,200 to 1,500 lb. per acre, barani 100 to 700 lb. per acre. Dr. Burns considers that an improvement of 20 per cent is possible.

The all-India average for the last 26 years is 484 lb. per acre.

Bajra.—Dr. Burns places the average all-India yield at about 320 lb. per acre. He considers it possible by adopting dry farming methods, to increase the yield by 25 per cent, i.e., to 400 lb. per acre.

(The average shown in the graphs for the last 12 years is 367 lb. per acre.)

Maize.—Dr. Burns thinks that the present average yield of 800 lb. per acre can be increased by 25 per cent to 1,000 lb. per acre.

By adopting the method of "Hybrid Vigour", an increased yield of 35 per cent has been obtained in commercial productions in the United States of America.

APPENDIX I

POPULATION

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POPULATION.

Question

Having regard to the present size of the population of your province and its potential growth and having regard also to the present and potential resources of your province, are you convinced that measures should be now undertaken for securing a limitation of the rate of increase of the population? If so, state and discuss the measures you would recommend for the purpose.

Replies

1. *The Government of Assam.*—The question of the limitation of the rate of increase of the population is not so pressing now.

2. *A Deputy Commissioner in Assam.*—It is obvious that correct birth-control should be taught and appliances made cheaply available. The only saving factor at present is the inefficiency of public health measures, especially with regard to malaria and smallpox. But public health measures may be expected to improve greatly and the need for birth-control will then become even more pressing.

3. *A Subdivisional Officer in Assam.*—Measures for restriction of the rate of increase of population are necessary but I see little hope of success in our present state of education.

4. *A Sub-Deputy Collector in Assam.*—Limitation of our birth-rate is not at all necessary under present conditions, and with our available resources, if we are only allowed to use them.

5. *The Government of Bengal.*—The present increase in population seems to be quite normal. Some percentage of this increase is due to the influx of labour from other provinces due to military activities and other offices being shifted to Bengal. The permissible increase cannot be worked out unless the potential resources and capacity of the country are measured. Control of birth at this stage, however, does not seem to be imperative.

The following two steps seem to be the only ways by which a healthy nation can be built up:

(1) Spacing of births, and

(2 Restriction of marriageable age to a minimum of 21 years for the boy and 16 years for the girl.

It is considered necessary that a good deal of propaganda and education in health, sex and hygiene will have to precede any of these two steps.

6. *The Government of Bihar.*—A statement is attached[1] which shows district by district the density of the population per square mile of total area and cultivable area in 1931 census and 1941 census. Between 1921 and 1941, the population of Bihar increased from 29 millions to 36, while during the same period the total cultivated area fell from 26 to 25 million acres. Thus the same or slightly diminished area of land has to support a very much higher population with no striking advance in the methods employed for agricultural production. The total average area under food-crops in the quinquennium ending 1941–42 was about 19½ million acres (including about 4 million acres sown more than once), i.e., about ½ an acre per head of population. The experience of European countries and of Japan is, that not more than 300 per square mile of land (640 acres) can be supported if the population is to maintain a reasonable standard of comfort, i.e., roughly about two acres per head. In Bihar even if all the cultivable waste (6½ million acres) is brought under cultivation, there will be little less than an acre per head of population. Bihar must make very striking improvements in agriculture and go in for extensive industrialization if she is to improve the standard of living of the people appreciably. It will take a long time for her to approach the standards of

[1] Not included here.

living of even the comparatively poorer European countries, whereas she has already far outstripped them in the density of her population and is further increasing at the rate of 10 per cent every decade.

Therefore the question seems to admit of no other answer than to emphasize the urgency of adopting measures to restrict the rate of increase of the population.

It is however one thing to be intellectually convinced of the need of birth-control; its realization is quite a different matter. The subject is highly controversial. It is doubtful whether the population of India, at any rate, the classes in which birth-control would be desirable, will adopt it in any measurable time. There are immense prejudices, marriage and other personal laws to be overcome before birth-control becomes an accepted fact in Bihar or India. It is therefore necessary to organize public opinion on the matter, because obviously there are no known methods of compelling birth-control. It will have to be persuasive and voluntary. On the other hand we cannot also overlook the immense volume of literature and organized opinion in western countries against birth-control, even when economists and social reformers there are intellectually convinced of the need for the same. The Church has always looked askance at it; psychologists are divided in their opinion regarding the desirability of using such methods; and moralists see in birth-control a potential danger to the stability of marriage and social institutions. It is also the experience of European countries that generally speaking it is the upper classes who practise birth-control and these are precisely the classes which in the interests of society should not do so. It is feared by many that unless the upper classes relax birth-control and go in for larger families, the composition of the population at no distant time will largely consist of those, who in the interests of society are the least fitted to perpetuate it.

Nevertheless and despite its dangers, psychological, social, moral and otherwise, it seems impossible for Bihar to escape adopting measures of birth-control if her population is to attain and maintain a decent standard of living, though this is a matter which should be treated on an all-India, and perhaps in due course, as an international problem. There is need and scope for intense propaganda on the subject for educating public opinion. Public men and leaders of influence and personality should take the lead in the matter. It is useful to form societies entirely non-official for propagating the idea of birth-control on the lines of the NeoMalthusian League in Madras and educating the people to the need for the same and the dangers of letting the present increase to continue. Should public opinion demand it, and it is desirable in this matter for the initiative to come from the public, the State should be prepared in course of time to open birth-control clinics at suitable places in all districts and Government hospitals and dispensaries. Other measures which may be adopted depending on the growth of public opinion are compulsory sterilization of the unfit, raising the age of marriage, education of women with a view to secure their economic independence and abolition of polygamy. The growth of a sense of social obloquy attaching to the rearing of large families and propaganda directed to this end may well prove a potent influence to achieve the objective.

7. *A public man in Bihar.*—The growth of population rapidly is a very serious problem . . . . Migration to the Chota Nagpur plateau may for some time solve the problem but not for all time. There are only two ways of meeting it: either by encouraging migration to some other province or countries, or propaganda for birth-control. The country is not prepared for the second. Every Hindu and Moslem must marry and once he marries the control of population is impossible. I do not think any country will welcome emigrants from India. These are, however, higher problems of general planning in the country.

8. *A Government official in Bihar.*—I do not think that limitation in the rate of increase of population of Bihar is necessary at all at the present stage.

9. *Another Government official in Bihar.*—I am convinced that a limitation of the rate of growth of population in this province would be highly beneficial for the economic uplift of the masses. Though the scientific discoveries and inventions of the last two centuries have been utilized in the industrial field by the establishment of a number of industries on up-to-date lines, yet the vast field of agriculture in this province remains almost unaffected except for some little improvement in the quality of seed used. On the other hand, the growth of population shows no signs of abatement.

from being an exporter of foodgrains she is tending to become an importer in spite of the fact that Bihar stands first among the provinces of India in the number of emigrants she sends out to other provinces. There are vast possibilities of industrial development in this province, particularly in the Chota Nagpur area, and whatever may be the cause of her industrial potentialities remaining undeveloped, insufficiency of labour is not one of them. A restriction of population growth will relieve the pressure on the soil and it will not hinder the growth of industries.

Perhaps the most effective method of restraining the growth of population would be the opening of birth-control clinics at every district board hospital and dispensary in order to impart instruction in easy, safe and cheap methods of birth-control. Other methods like legislation for raising the age of marriage (such as the Sarda Act), education of girls, throwing open more avenues of employment for women to enable them to attain economic independence, compulsory sterilization of the unfit, abolition of polygamy, restraining aged widowers from marrying virgin girls, the growth of social obloquy attaching to the rearing of very large families, etc., are difficult of application and of very slow growth.

10. *The Government of Bombay.*—The population of the Province has increased from 17,992,053 in 1931 to 20,849,840 in 1941 and is likely to increase still further. Limitation of population is necessary but the usual birth-control measures cannot be popular amongst the poorer classes, partly due to ignorance and partly due to want of necessary funds to purchase the equipment. Limitation of population can best be achieved by spread of literacy and increase in the standard of life and all measures designed to make every citizen more alive to his duties and responsibilities.

11. *The Government of the Central Provinces and Berar.*—There are about 173 people per square mile in this province. The land if properly developed can serve this population. Birth-control measures as known at present are beyond the means of the poor villager. In any case, they can be advocated only on medical grounds, i.e., for parents in medical need of it.

The limitation of the rate of increase is better attained by raising the standard of living of the people.

12. *The Government of Madras.*—In a separate minute on this question a member of the Board of Revenue has suggested that a check on the growth of population is so essential that, despite political and other difficulties, emigration on a large scale should be encouraged after the war, for example, from parts of India to Burma, Malaya, Ceylon, Africa, Australia, etc. The Government do not consider that a check on the population is feasible or necessary and are of the view that with economic development of this Province it will be possible to feed all its population.

13. *A Member of the Board of Revenue, Madras.*—In my view the main cause for the distressingly low standard of living in South India is over-population. Many endeavours have been made, during the past hundred years, to raise the standard of living in the Province, but little has been achieved and the main cause has been the rapid increase in population. For example, the development of irrigation has been great; much, though not enough, has been done to develop improved agricultural methods; the co-operative movement has been spread throughout the Province; great attention has been paid to the uplift of the Scheduled castes and yet we find that Dr. Aykroyd has estimated that there is at all times serious under-nourishment of about one-third of the population. The main reason is that improvement resulting in increased productivity of the soil or increased industrial output, are accompanied by a corresponding increase in the size of the population, aided of course by improvements in the health and medical services. The most fertile districts are also the most thickly populated. Smiling Malabar and rich Tanjore contain, among their dense populations, some of the poorest people in the world. I do not consider that any effective solution for the problem of the submerged third (not tenth) in South India will be found, unless some method is adopted of checking the rapid growth in population. The other methods proposed—increasing irrigation facilities, improving agricultural methods, industrialization and the like, if pursued with great vigour and prodigal expenditure will reduce to some extent, the percentage of those living below the subsistence level, but will not, I fear, do much more. I apprehend that, as

happened in the past, the population will increase so rapidly following an increase in productivity and industrial output, that the general standard may fall back again to, or almost to, the old level.

It is true that in highly industrialized countries there is a tendency for the birth-rate to decrease, but I do not consider it feasible to convert India into a highly industrialized country. Even if, by large-scale development of industry, the percentage of those employed in industry was doubled, India would still be predominantly agricultural. My answer to the first part of the question is "Yes" if a substantial and permanent rise in the standard of living is to be secured.

As to the second half of the question only one method of reducing population is discussed, that is, emigration. This is considered impracticable, at least on any large scale. A check on the growth of the population is, however, so essential for raising the standard of living that, despite political and other difficulties, emigration, on a large scale, should, I consider, be encouraged after the war. If freedom from want to which the Allies are pledged is to be achieved, then arrangements must be made, on a global scale, for emigration, from over-populated to under-populated areas, or areas where labour is required, e.g., from parts of India to Burma, Malaya, Ceylon, Africa, Australia, etc. The only really effective method, however, of preventing the growth of population short of war, pestilence and famine, is birth-control. Presumably this has not been mentioned in the answer given above[1] because it is not considered to be practical politics. I feel, however, that the prevention of the present rapid rate of increase in population is so essential to the welfare of South India, that an attempt should be made even at the cost of wounding religious feelings, to popularise birth-control. At least the case for limiting families could be explained to the public, and facilities afforded when the war is over, if possible earlier, for the purchase by the public of contraceptives at a nominal price. It is interesting to note that the Women's Sub-Committee to the Post-War Reconstruction General Committee has stressed the need for birth-control clinics to teach mothers about the spacing of children.

14. *A non-official social worker, Madras.*—Comparative study of figures of the population of the Province may lead one to the conclusion that unless natural causes operate to decrease the population, it may be difficult for production to keep pace with increase in population and, therefore, it would be desirable to secure limitation of the rate of increase of the population by other means. The demand for opening avenues for emigration also lends weight to this view. But things are not so bad as they appear from a cursory view. The present and potential resources of the provinces have not been utilized to the fullest extent both in agriculture and industry. While there are areas where over-population, in fact ever-increasing population is the rule, there are other areas which remain undeveloped and which if exploited can absorb all the excess population. It is lack of planning that is mostly responsible for the existence of undeveloped areas. If Regional Development Boards are constituted, they are sure to help in minimising such differences by giving unremitting attention to their regions. If all the irrigation schemes under contemplation, including what is known as the Polavaram scheme, are executed, if the mineral resources of the province are exploited, if the possibilities of industrial development are explored and industries to utilize all the available raw materials are promoted even affording State assistance whenever necessary, if the colonization of and settlement in tracts which do not now possess attractions are encouraged by making it worth while for people to migrate, if all factors which render agriculture a deficit economy are removed, if the cultivator is assured of the enjoyment of the increased benefits derived from land on account of his labour and enterprise without being forced to share them with the intermediaries or those who contribute nothing for such increased benefits, be it a landlord or the State, these and other measures are sure to improve the productivity of the Province and ensure absorption of its growing population without further impairing the standard of living.

Artificial means of limiting population are already known to the educated classes and they are being practised. But no method has yet proved successful and the use of birth-control appliances is not so simple and easily adoptable by ignorant or half-educated persons. Moreover, certain

[1] Not quoted here.

religious objections are urged against the use of artificial methods. Education alone will produce the necessary change. Quacks should not be permitted either to do propaganda or offer advice. Propaganda and clinics should be controlled or guided by the State. Entry of quacks into this field should not be allowed, for, any wrong advice or wrong prescription will do incalculable harm affecting the health of future generations.

While measures suggested above may be usefully employed, it cannot be denied that the rise in the marriageable age of boys and girls, a reform which has slowly and silently spread even in villages, has proved a natural check on the growth of population. If monogamy is also recognized as a rule of life, this too will prove a natural check. There is no denying the fact that in communities where polygamy is tolerated and even practised without incurring the displeasure of the community, the growth of population is rapid.

15. *The Government of the North-West Frontier Province.*—This question begs the answer to an important ethical and socialogical problem. This Government presumes that in peace time the Russian proverb "The world is not tied up in a corner" applies. This Government draws attention to the fact that the object of the Hot Springs and other similar and subsequent conferences has been to ensure sufficient for all classes of persons throughout the world, and that it is not intended to allow pre-war economical exigencies of reducing production to maintain prices, and destruction of essential commodities for the same purpose to continue. Provided the world is regarded as a unit and not as distinct parts, it is clear that there is more than sufficient for the existing population and for an increasing population. Speedy means of transport are available and will become increasingly so. Hence the problem of distribution is not insoluble. This Government feels that these probably self-evident facts should be stressed because outside the opinion of a few of the reformed Christian churches, the idea of birth-control is repugnant to all other religions, and would be considered by them as method of enforcing the Nazi ideas and ideals of a "Herrenvolk." All religions of India accept Genesis 28 in its literal sense as a binding commandment and would resent any action, particularly of non-Indian origin, whereby restriction of birth was to be secured, or enforced whilst sufficient for their livelihood is available in the world. This does not necessarily mean provision on the spot of deficiencies, but could apply to large areas of the world, which at present are under-populated. This Government, therefore, feels that the Famine Inquiry Commission would be well advised not to proceed with the examination of this question further since it must raise issues outside the immediate problem under consideration.

It would be folly to demand a decrease in birth-rate on the grounds of scarcity in face of Judge Marvin Jones' (the United States Director of War Food Administration) very recent pronouncement that an early end of the European war would find the United States in possession of large stocks of food and measures should be taken to dispose of them in all parts of the world by every available means. Mr. Pearson, President of the Food and Agriculture Organization (an International body on which India is represented deriving from the Hot Springs Conference) does not appear to be apprehensive of future food supplies.

16. *The Government of Orissa.*—The increase in population of this Province during the first 40 years of the present century is the lowest of all the provinces of India. The proportion of increase during the decade immediately preceding the last census of 1941 is similarly also the lowest of all the Indian provinces. The present rate of increase is about 90,000 per year. The growth of population has not, therefore, till now been a cause of anxiety or alarm. With the improvement in the standard of living expected in the coming post-war periods the birth-rate may, no doubt, go down but on the other hand the death-rate will also be reduced with the expansion of public health services and better control of epidemics and the net result may be a more rapid increase of population than was even registered at the last census. Since there are possibilities of extension of cultivation and increasing the yield of food crops by improved agricultural methods, it does not seem at present necessary to adopt measures for securing a limitation of the rate of increase of the population in this Province.

17. *The Government of the Punjab.*—This is a question on which opinion is sharply divided. On one side is the modern educated young economist while on the other side is the old type Punjabi, religious and sentimental with faith in his Creator and the Government. So far the idea of birth-control finds favour amongst that class which comparatively speaking has a much better standard of living than a person of average means in the province. It is doubtful if the educated person supports birth-control from a purely economic point of view. In any case the number of such people is insignificant. Both from the point of view of religion and of the defence of the country it would seem rather too early to advocate birth-control on a mass scale in this province. We are not a deficit province in the matter of foodgrains and even if the population increases at its present rate our surplus will carry us through another 20 years or so, but this Government has got huge schemes of irrigation under its consideration. If and when these schemes are completed ample electric power should become available for industrialization and also for the extension of cultivation. It may be hoped, therefore that *pari passu* with the increase in population there will be an increase in the means of production and in employment and there should be no danger of starvation or even under-feeding. On the other hand, if Government took up the advocacy of birth-control it will have to be responsible not only for setting up an agency for propaganda but employ a huge staff of men and women to run birth-control clinics and spend an appreciable sum on research. Even when this is done it is doubtful if the people with their deep-seated prejudices will take it kindly.

18. *The Government of Sind.*—It will be clear from the answers to other questions that there is at present no danger of over-population in Sind.

19. *The Government of the United Provinces.*—There is no doubt that the increase in population has overrun the food production in the province. According to Professor Radha Kamal Mukerjee * the recent increase in the food production has been mainly at the expense of pasture lands with the result that there has been scarcity of fodder for cattle. This increased production cannot, therefore, be relied upon for the solution of the population problem. The rate of increase of population is tending to show a downward trend. Even so, the problem does not admit of any complacency and needs active consideration. Matters cannot be left to Nature's ruthless method of establishing an equilibrium by bringing in pestilence, famine and war. The theory that planned parenthood is what is actually required will be widely accepted, but the methods to be employed to attain it admit of no easy solution. Some measures are suggested below:—

(1) There should be a Provincial Standing Committee for family planning to help the Director of Public Health in all schemes to that end.

(2) Education for planning parenthood is most necessary. It should be emphasized that this does not necessarily mean family limitation for fewer children. It will mean spacing of births and limitation of family size according to the economic status and the standard of health of the family. Parenthood must remain voluntary and planned. Parents should have the most modern and scientific knowledge of contraception.

(3) Free birth-control clinics through Public Health and Maternity Services, and cheap or even free supplies of contraceptives should be provided.

(4) The cults of "total abstinence", "intercourse only for begetting children" are not likely to be adopted. Nor will the Irish method of postponing marriages or for fewer marriages find favour in our province, although during the last 20 years there has been a general raising of age at marriage particularly in educated families.

Taxation of large families as a measure to limit the rate of growth of population has certain definite and serious drawbacks which make its adoption undesirable. They are as follows:—

(i) A family already made poor by increase of children should not be further taxed, since children themselves are a heavy tax on the family and act as a check on further reproductive activity.

* "The Food Supply" (1942), Oxford University Press.

(ii) Usually the poorer families beget more children and taxation in this direction will further deteriorate their nutrition and general standard of living.

(iii) Taxation will not produce the desired result with the masses who are uneducated.

(iv) Taxation will interfere with the liberty of the individual in the exercise of one of the primary instincts.

(v) The tax will lead to increase in crimes like criminal abortion and infanticide.

(vi) There will also be many difficulties in assessing the size of the family and realizing taxes from remote villages, and will require a complicated administrative machinery. Thus the law will defeat its own end.

20. *An authority on population, author of one of the standard works on population in India.*—This Province (Bihar) is, as a whole, over-populated and introduction of contraceptives and instruction in their use as a part of health service organization will have to be provided for in any scheme of all round agricultural improvement. The aim should be to stop further growth of population in the Province, as in the country as a whole, and the introduction of measures for improvement in the quality of the existing population in a manner as to make their future utterly unlike the present.

APPENDIX II

LAND TENURE PROBLEMS

A.—Prevailing systems of land tenure.

B.—Size of holdings; subdivision and fragmentation.

C.—Landlord and tenant (passing of land from cultivating to non-cultivating classes; absentee ownership of land; rack-renting).

D.—Reform of land tenure.

APPENDIX II

LAND TENURE PROBLEMS

A.—Prevailing Systems of Land Tenure

Question.

Describe the various systems of land tenure prevalent in your province. State the extent of land held under each of these systems.

Abstract of replies.

1. *Bengal.*—The principal system of land tenure is the Permanent Settlement created by Regulation I of 1793. The revenue was fixed in perpetuity and all zamindars were placed in the same category. While some farmers obtained some 'proprietary' rights which they had never possessed, the independent chiefs and the old landholding families were confirmed in the position they had occupied for centuries. In certain cases, revenue-free grants made by former rulers which were subsequently recognized and confirmed, are held as revenue-free estates. Later when the policy underlying the permanent settlement was abandoned, new estates were created with either Government or private persons as proprietors, and they are liable to periodical revision of land revenue. The relative importance of these four different types of tenures may be seen from the table below:—

Category.	Number held (in 1,000).	Area in millions of acres.
I. Permanently-settled estates (revenue-paying).	94	37·37
II. Revenue-free estates	51	1·97
III. Temporarily-settled estates	4	3·34
		42·68
IV. Estates held direct by Government ..	4	3·65
		46·33

Note.—These figures represent gross area of estates, and not merely of lands occupied by ryots in the estates. Further information furnished below is based mainly on the Report of the Land Revenue Commission, Bengal.

The "Estates held direct by Government" are the same as what are known as ryotwari tracts elsewhere. Most of the lands in the zamindari estates are held by ryots whose rights in the land and obligations to the zamindar have been regulated by a long series of tenancy laws, the net effect of which is that the ryot possesses substantially the same rights in his holding as ryots holding land direct from Government in Government estates in Bengal, and these again are practically identical with those of ryots holding direct from Government under the ryotwari settlement in other provinces. The incidence of the rent payable by the ryot to the zamindar in Bengal compares, in general, favourably with the incidence of land revenue payable to Government by ryots in ryotwari areas. The land held by a ryot may be cultivated either by himself or by crop-sharing tenant, or by under-ryots. Under-ryots fall into three classes, of which the first possesses practically all the rights of ryots except transferability; the second and the third differ from the first mainly as regards liability to ejectment in certain circumstances. The tenant who is not an under-ryot is usually a crop-sharer (called a *bargadar*) and his relations with the ryot are purely contractual.

The following table shows the area of lands held by ryots and under-ryots:—

Class of ryots and under-ryots.	Area in millions of acres.
Land held rent-free or on fixed rent	3·73
Land held by ryots	27·97
Land held by under-ryots	3·09
Total ..	34·79

There is a limited extent of land in the cultivating possession of proprietors of estates and persons holding as under-tenure holders. The exact area is not known, but from certain estimates of these assets made by the Land Revenue Commission, it may be inferred that this is probably of the order of six hundred thousand acres or less than two per cent of the total area held by ryots and under-ryots.

The characteristic feature of the present condition of proprietary rights in estates is the prevalence of subdivision and sub-infeudation to a large extent. The zamindars are free to transfer their rights to whomsoever they might think proper by sale, gift, or otherwise. Where transfers of the nature of a perpetual lease subject to a rent reserved, are effected, a permanent under-tenure is created, which in its turn may be likewise subdivided and sub-infeudated. "The development of sub-infeudation has led to a revenue system of immense complexity, particularly in districts like Bakarganj, where as many as 15 or 20 grades of tenure holders are not uncommonly found."[1]

2. *Bihar.*—The systems of land tenure prevalent in Bihar are substantially the same as in Bengal, the system of permanently-settled estates being the predominant form to an even larger extent. Particulars regarding the gross area under estates are not available. The following table shows the acreage of land held by proprietors, under-tenure holders and different classes of cultivating holders of land:—

			Area in millions of acres.
A	1.	Held by proprietors (including *Zirat* and *Bakasht*).	2·12
	2.	Held by tenure holders in cultivating possession	·1·34
			3·46
B	1.	Occupancy-raiyats other than those paying produce-rents	16·58
	2.	Occupancy-raiyats paying produce-rents	2·33
	3.	Rent-free holders	0·96
	4.	Raiyats holding at fixed rents or rates	0·49
			20·36
C	1.	Non-occupancy raiyats	0·33
	2.	Under-raiyats	0·33
			0·66
		Total (A, B and C)	24·48
		Unoccupied	4·25
		Grand total	28·73

NOTE.—The foregoing figures are based on figures collected from survey and settlement reports which are liable to be out of date. The figures, therefore, are useful merely for furnishing an idea of the different types of holdings and their relative importance.

The small class of raiyats holding at fixed rents or rates (B-4) are a privileged minority whose status compares favourably with the holders of land under Government in ryotwari areas in that the rents payable by them are fixed in perpetuity. The largest group, namely, the occupancy-raiyats (B-1 and B-2), possess substantially the same rights in land as the raiyats in Bengal and the holders of land under Government in ryotwari areas. The bulk of them (B-1) pay a cash rent, which is revisable. There is, however, a section of occupancy-raiyats (B-2) who are liable to pay a produce-rent.

The produce-rent is sometimes fixed as a share of the produce, sometimes at a fixed quantity per unit of land in the holding, and sometimes as a quantity fixed on the holding. In some cases, the landlord's share is paid according to appraisement and sometimes by actual division. There

1 Report of the Land Revenue Commission, Bengal.

are also cases where the cultivating holder is liable to pay a cash rent on fields which ordinarily pay produce-rent when certain crops, particularly sugarcane, are grown on them. The proportion of the produce payable as rent by the cultivating holder varies (presumably with the type of land as well as with the nature of the tenure—occupancy-raiyat, non-occupancy raiyat, or under-raiyat as the case may be), and appears to range between one-third and two-thirds. As a result of recent legislation, there is now a statutory maximum to the produce payable by an occupancy-raiyat, and this is 9/20ths of the produce. The incidence of rent in such cases must be many times heavier than cash rents in estates and land revenue payable by ryots in ryotwari areas.

3. *Orissa.*—Tenures prevailing in this Province are substantially similar to those in Bengal, the area of permanently-settled estates being relatively smaller than in Bengal. Relevant figures are given below:—

	Area in millions of acres.
Permanently-settled estates	9·13
Revenue-free estates	0·32
Temporarily-settled estates	5·18
	14·63
Raiyatwari and Khas Mahal (corresponding to Government estates in Bengal)	5·98
..	20·61

There are some distinctive features not present in Bengal which are described below:—

(i) Revenue-free estates in the northern districts of the province are of the same type as in Bengal; that is, a bifurcation of proprietary rights and occupancy rights exists, and cultivators acquire occupancy rights as in zamindaris. In the districts transferred to the province from Madras, this is not invariably the case. Cultivators holding under the revenue-free proprietors may acquire occupancy rights in some estates but not in others.

(ii) In the district of Sambalpur, the Gauntiai tenure prevails—a form of tenure intermediate between the zamindari and the ryotwari. The Gauntia is an agent for the collection of revenue due to Government from settled lands. He is the holder of some lands given to him in lieu of remuneration. He has also the right to lease out the waste lands and appropriate to himself the rent on such lands up to the next settlement. The Gauntia's rights are heritable and transferable. Tenants in such villages acquire occupancy rights.

(iii) Though cash rent is the common feature in the province, a considerable area is held on produce-rent which is generally of two kinds. The commonest form is known as the *dhuli-bhag*, meaning an equal division of the grain and the by-products. The second form is that known as the *Sanja* (i.e., contract), under which a fixed quantity of the produce is payable.

4. *Assam.*—The major portion of two districts in this province (Sylhet and Goalpara) is settled under the zamindari system as in Bengal. The rest of the province is settled under the raiyatwari system. The actual cultivator may be a ryot holding under the Government or a ryot holding under a zamindar. He may also be a tenant holding under a ryot and paying a share of the produce called the *adhi-bhagi*.

	Area in millions of acres.[1]
Raiyatwari	29·87
Zamindari permanently settled	3·92
Zamindari temporarily settled	1·70
	35·49

1 The figures have been taken from "The Indian Rural Problem", Sir Manilal Nanavati and J. J. Anjaria.

5. *The United Provinces.*—The system of permanently-settled estates prevails in the Benares Division, parts of Azamgarh district, and in parts of the districts of Gonda and Bahraich. The rest of the province is temporarily settled. The ryotwari system does not prevail in the province.

The unit for purposes of settlement is the mahal, which may be either a single zamindari in which a mahal is held by one person, or a joint zamindari in which a mahal may be held by more than one person. The Talukdars of Oudh have the privilege of engaging with the Government for the revenue of a whole taluka instead of for one mahal. They also hold the right to create a sub-proprietary right in favour of another person in the taluka. The rights of Talukdars are transferable and heritable by a single heir.

The following table shows the areas of lands held by proprietors in cultivating possession ('Sir' or 'Khudkasht') and those held by various classes of tenants:—

		Area in millions of acres.
A.	'Sir' and 'Khudkasht'	5·96
B.	(1) Hereditary tenants	14·99
	(2) Occupancy tenants	10·41
	(3) Ex-proprietary tenants and holders of special tenures in Oudh	0·81
	(4) Fixed-rate tenants and permanent tenure holders.	0·71
		26·92
C.	Non-occupancy tenants	0·19
	Total ..	33·07

The tenants of category B, class (4), are those holding lands under proprietors in the tracts under permanent-settlement made under Regulation I of 1793. They possess rights in land of substantially the same character as the raiyats in Bengal as well as raiyats holding land under Government in the raiyatwari areas. The other tenants of category B differ from them in this important respect—that they have not got transferable rights. All tenants of category B have got hereditary rights. Non-occupancy tenants (category C) are a small class of tenants who do not possess hereditary rights.

6. *The Central Provinces and Berar.*—In this province there are no permanently-settled estates. The principal system in the Central Provinces is that of the temporarily-settled estates similar to the United Provinces. The proprietors are known as malguzars. There is a small class of plot proprietors who are separately assessed to land revenue on lands situated in mahals. These are known as *malik-makbuzas*. The whole of Berar and some villages in the Central Provinces proper are settled on the raiyatwari system. The following table gives the holding of land by proprietors as well as different classes of tenants:—

		Area in millions of acres
A.	Held by malguzars ('Sir' and 'Khudkasht')	3·87
B.	Held by malik-makbuzas ..	0·85
C.	Held by absolute occupancy tenants	2·10
D.	Held rent-free subject to rendering village services ..	0·18
		7·00
E.	Held by raiyats in raiyatwari villages—	
	In the Central Provinces	1·28
	In Berar	8·30
		16·58

Madras.—The raiyatwari settlement, under which lands are held direct from Government by ryots, is the principal form of tenure in this province. The permanently settled zamindari tenure also prevails to a large extent. The areas are given below:—

	Millions of acres.
Raiyatwari area	27·65
Zamindari area	12·84

A special form of tenure known as the *inam* also prevails and is to be found both in raiyatwari and zamindari tracts of the province. *Inam* villages or lands may be held either revenue-free or at a reduced assessment called a quit-rent. The *inams* are of many kinds and result from grants made by former Governments for religion, charity, public service, military and other rewards, and so forth; and there are minor *inams* scattered throughout the villages which are enjoyed by village artisans, etc., as part of their emoluments and by various other persons or institutions. Whether or not the tenure of the holder of *inam* is similar to that of proprietors of permanently-settled estates in so far as the rights of cultivators holding under him are concerned, depends on the nature of the grant and the effect of recent legislation.

Other forms of tenure presenting special features are the following:—

(i) In Malabar, three distinct interests in land known as the Janam, Kanam, and Verumpattam, are recognized, and their rights are to some extent regulated by law.

(ii) Instances of temporarily-settled estates of the Central Provinces type are to be found in parts of the East Godavari district.

(iii) In South Kanara, a system of permanent under-tenures has developed within the raiyatwari system, as the result of perpetual leases at a fixed rent, granted by persons holding lands under Government.

Sub-infeudation of proprietary rights in zamindaris has been held in check in this province, since early in this century, as a result of legislation. Many of the larger estates are inalienable and impartible and succession is regulated by the rule of primogeniture.

In general, the relations between tenants and holders of land are governed by contract, whether the holders of land are raiyats holding under Government under the raiyatwari system, or raiyats holding under proprietors under the zamindari system. Broadly, tenancies are either on a crop-sharing basis or on the basis of fixed or standing rent in cash or produce. Under each of these, there are some variations in accordance with the nature of the land, irrigation facilities, and contribution of seed, manure and plough-team by the landlord and the tenant, respectively, and the kind of crop raised.

8. *Bombay.*—The predominant form of tenure in this Province is the ryotwari system. Out of 32·29 million acres of occupied assessed land, 24·44 million acres are held on this tenure. A small proportion of this area, 1·22 million acres, is held on what is called the restricted ryotwari tenure under which the holder is subject to the condition that the land cannot be transferred except with the permission of the Collector. This restricted tenure is generally made applicable only to backward classes of cultivators.

While the zamindari system as such either in its permanently-settled or temporarily-settled form does not prevail, the inam tenure is common as in Madras. There are also the following special forms of land tenure:—

(i) *Talukdari tenure.*—This is found within the Ahmedabad district. Talukdars are absolute proprietors of their respective estates, subject to the payment of Government demand which may be either fixed or liable to periodical revision. The more important of these estates observe the rule of primogeniture, but in the case of the smaller ones the number of co-sharers increased from generation to generation. The talukdar cannot encumber his estate beyond his own lifetime without the permission of the Talukdari Settlement Officer, or alienate it permanently without a Government sanction.

(ii) Other forms of tenure are the *Bhagdari tenure* in parts of Kaira, *Narvadari tenure* in Broach, the *Khoti tenure* in parts of the Bombay suburban, Colaba, and Ratnagiri districts, *Mehwasi tenure*, *Udhad Jamabandhi tenure*, *Maleki tenure*, and the *Sarakati tenure*. In general these special features partake of the characteristics of temporarily-settled estates.

The total area under inam, talukdari, and other forms of alienated tenures is 7·85 million acres.

9. *Punjab.*—The cultivated area of the province (31·17 million acres) is held by owners and tenants as shown below:—

		Millions of acres.
(i)	Tenants-at-will	15·26
(ii)	Owners	9·49
(iii)	Government tenants	3·23
(iv)	Tenants with rights of occupancy	2·54
(v)	Government lessees	0·65
		31·17

Though the term 'zamindar' is generally used to describe a landholder in this province, the tenure system is essentially ryotwari, that is to say, the person who holds land direct under Government is also the person who has the permanent and heritable right to cultivate the land. This is not, however, the case in respect of lands held by tenants with rights of occupancy who hold 2·54 million acres. These tenants hold under other owners who hold under Government. The nature of their right in the lands they hold is, however, substantially the same as those of ryots holding land under Government in ryotwari areas; or under proprietors in permanently-settled areas. They have to pay the owner a small sum in addition to the land revenue demand of the Government, for which theoretically, the owner is held responsible. The class described as Government tenants holding 3·23 million acres was created by the Colony Act of 1910 which gives them certain rights of alienation and succession. The rights and obligations of this class of tenants are governed by a statement of conditions issued by the Government which usually provide for the acquisition, first, of occupancy and, ultimately, of proprietary rights. (This class is, therefore, analogous to the ryots holding land in Bombay on the 'restricted' ryotwari tenure.) The Government lessees are tenants holding for a term according to their leases. The tenant-at-will holds generally under 'owners'; and has no security of tenure beyond his claim to harvest the crops he has sown, though in practice satisfactory tenants are hard to replace and are not ejected. The prevalence of large holdings is a notable feature of this province. It has been estimated that 2·4 per cent of the owners hold 38 per cent of the land, and their holdings are 50 acres or more in extent.

10. *Sind.*—Here also the ryotwari system prevails. Roughly four-fifths of the cultivated land is held by persons who, as in the Punjab, are described as zamindars. Their lands are cultivated by tenants (known as *haris*) on the 'batai' or crop-sharing system. The cultivator provides his own labour and that of his bullocks in return for a half-share of the crops which he harvests. All Government dues on the land are paid by the owner. Landowners who are unable to manage their own lands on this system customarily grant leases for a period of five years and the lessee, in his turn, gets the land cultivated on the crop-sharing system by *haris*.

11. *North-West Frontier Province.*—The principal form of land tenure in this province is called Bhaichara, under which the whole "village brotherhood" undertake a measure of responsibility for land revenue due from individual holders to Government. In practice, however, the responsibility for payment of defaulters' revenue is not enforced. Other forms of tenure are described as Zamindari and Patidari. Particulars of area are unavailable.

B.—Size of Holdings; Subdivision and Fragmentation

Question

(i) Is there a tendency to progressive reduction in the average size of holdings and/or their fragmentation?

(ii) Have any measures been adopted to restrict subdivision of holdings, if so, with what results?

(iii) Have any measures been adopted to promote consolidation of holdings, if so, with what results?

(iv) What measures would you recommend for securing improvement in these respects?

Abstract of replies

Part (i) of the question

1. (*a*) "*Is there a tendency to progressive reduction in the average size of holdings?*"—Assam, Bihar, Bengal, Bombay, the Central Provinces and Berar, Madras, Orissa, and the Punjab Governments agree that the tendency exists and is well marked. In the case of the United Provinces, available information is inconclusive, and it seems probable that there has not been much subdivision of holdings but a decrease in the size of plots within holdings. Joint holdings continue to be a common feature. In Sind it is stated that there is no problem since the great bulk of the cultivated land is composed of fairly large estates. The Provincial Government add that the tendency to fragmentation[1] in small peasant holdings has been checked by imposing conditions of impartibility on peasant grants. In the North-West Frontier Province, it has been stated that there is no tendency to progressive reduction in the size of holdings or their fragmentation[1]. The fragmentation of holdings is the inevitable result of partition proceedings and inheritance under customary law or the Shariat following death.

(*b*) "*Is there a tendency to progressive fragmentation of holdings?*"—It is agreed by all provinces that there is such a tendency. Except in Sind and the North-West Frontier Province, it is also agreed that this is a problem requiring remedy.

Part (ii) of the question

2. "*Have any measures been adopted to restrict subdivision of holdings, if so, with what results?*"—No remedies have been tried in any province. The following may be regarded as exceptions to this statement. (*a*) In the Central Provinces, revenue officers are forbidden to partition a holding if it involves the formation of a holding with an area of less than 10 acres. This is enforced by a rule under the Central Provinces Tenancy Act. This is not effective as the parties can privately partition the same holding to any extent they desire. In Berar, there is a similar minimum limit for subdivision which is, however, only one-fourth of an acre. It is possible that there are in other provinces also some limits to officially recognized subdivisions, but, as in the Central Provinces, they must be ineffective for preventing private partition. (*b*) In Sind, it is reported that conditions of impartibility are imposed on grants referred to already.

Part (iii) of the question

3. "*Have any measures been adopted to promote consolidation of holdings, if so, with what results?*"—No measures have been tried in *Assam, Bihar, Bengal, Bombay* and *Orissa*. No measures have been tried in *Sind* except the imposition of conditions of impartibility on peasant grants referred to already.

In *Madras*, an attempt was made in 1936 to secure consolidation of holdings and 26 co-operative societies were organized. Only 1,599 acres were consolidated, and the Government abandoned the experiment and concluded that, "so long as subdivision has to go on, any attempt at

[1] The problem of subdivision and not of fragmentation is probably referred to here.

consolidation of holdings was bound to fail." The experiment was tried in the absence of special legislation and this is said to be one of the causes of failure. Other difficulties are stated as follows:—

(*a*) The general conservatism of ryots.

(*b*) Difficulties in title, especially where minors were involved.

(*c*) Encumbrances on fragments which could not be cleared.

(*d*) Expenditure on encumbrance certificates and registration fees.

(*e*) Inability to prevent consolidated holdings from being fragmented again or from being encumbered.

In the *North-West Frontier Province*, the revenue officers are required to make endeavours to arrange partitions so as to secure consolidated holdings, but the experience is that this is not always possible.

The provinces in which action has been taken with some success are the *Punjab*, the *Central Provinces* and the *United Provinces*. Initially, consolidation was effected in the *Punjab* on an entirely voluntary basis through Consolidation of Holdings Societies, which numbered 1,807 on 31st July 1943. The total area consolidated by them was 1·45 million acres. Certain measures of compulsion have been provided by the Consolidation of Holdings Act under which work has been carried out in 376 villages and 0·31 million acres have been consolidated. The work is in progress in 86 more villages. The main difficulty is that it takes a long time to secure the consent of two-thirds of the landholders which is the pre-requisite for compulsory consolidation. Inadequacy of trained staff was another difficulty, which it is hoped will diminish after the war.

In the *Central Provinces*, fragmentation is being remedied by consolidation operations which have been in progress since 1926. They have been successfully completed in 2,476 villages in three districts of Chhattisgarh division under the Central Provinces Consolidation of Holdings Act of 1928.

In the *United Provinces*, consolidation of holdings is being encouraged through the co-operative movement since 1924. The results were small, approximately 42,000 acres being consolidated. Similar work was also undertaken in some Court of Wards Estates. The United Provinces Consolidation of Holdings Act was passed in 1939 and came into force in January 1940. Work was undertaken in six districts, but there has been difficulty owing to dearth of trained officers and staff. The Co-operative Department also continues its work on a voluntary basis. Further, the United Provinces Tenancy Act of 1939 contains provisions for helping the tenants to consolidate their holdings by exchange or acquisition.

Part (iv) of the question

4. "*What measures would you recommend for securing improvement in these respects?*"—(*a*) *Remedy for fragmentation.*—It is recognized generally that there is no final remedy for fragmentation as long as the process of subdivision continues unchecked. But this does not necessarily mean that anti-fragmentation is without value even if subdivision is not checked. Operations similar to those undertaken by the *Punjab*, the *Central Provinces*, and the *United Provinces Governments* under special laws providing for consolidation of holdings are favoured by other provinces generally, except in *Madras* where the attempt to deal with fragmentation has been given up and the view has been expressed that "the best method of combating fragmentation would seem to be the encouragement of co-operative farming."

In *Bihar* the question is under consideration by the Post-war Agricultural Reconstruction Committee, though it is felt that there are formidable difficulties in the way of consolidation which are presented by the multiplicity of tenure-holders between the ryot and the Government in that province which has been accentuated by the formation of new *pattas* under the Estates Partition Acts. Other difficulties are the indebtedness of the ryot and encumbrances of the nature of usufructuary mortgages. Compulsion is not favoured at any rate in the initial stages, as it might well cause hardship to the poorer cultivator and might create considerable confusion and unsettlement in the rural credit structure.

In *Bombay*, a Bill is being prepared to provide for the consolidation of holdings and is supported by public opinion.

In *Bengal*, the Land Revenue Commission which considered the subject agreed that consolidation was desirable but saw great difficulty in carrying it out in Bengal.

(*b*) *Remedy for subdivision.*—The gist of opinion expressed by Provinces is given below:—

(i) *Assam.*—The operation of the laws of inheritance will have to be checked. Some sort of a right of pre-emption will help. No effort in this line by legislation will be successful unless simultaneously industries are developed to absorb the extra man-power from the land.

(ii) *Bihar.*—The obvious remedy is to change the law of inheritance and to introduce the law of primogeniture. Such legislation is bound to be unpopular, will not help existing small holdings, and may be inexpedient until productive alternative occupations are available for the junior members of the family.

(iii) *Bengal.*—The problem reflects the ever-increasing pressure of population on land which is at the root of all the economic difficulties of the province. The laws of inheritance coupled with the free right of transfer have led to a systematic increase in the subdivision of holdings. The Land Revenue Commission considered the possibility of modifying the laws of inheritance or introducing a system of preferred heirs, and held that this was impracticable.

(iv) *Bombay.*—Public opinion is unlikely to support measures to check subdivision involving interference with the laws of inheritance.

(v) *Central Provinces and Berar.*—Consolidation has reduced fragmentation to the minimum but cannot stop the process of refragmentation as long as the present laws of inheritance continue.

(vi) *Madras.*—The best method would seem to be the encouragement of co-operative farming.

(vii) *Orissa.*—The problem is due mainly to the growth of population and the increasing trend towards the break-up of the joint family system. The laws of succession and also the free transferability of land are other causes. Suggested remedies are some form of pre-emption and collective or co-operative farming.

(viii) *Punjab.*—It is not possible to restrict subdivision of holdings without changing the law of succession. Public opinion is strongly opposed to depriving the owner's sons of their share until some equivalent means of income are ensured for them.

(ix) *United Provinces, Sind, and North-West Frontier Province.*—These Governments have expressed no opinion on this point.

C.—Landlord and Tenant

Questions

(i) To what extent was there a tendency for ownership of land to pass out of the hands of cultivating classes to non-cultivating classes? Has this tendency been arrested or reversed to any significant extent?

(ii) Is absentee ownership of land increasing? If so, do you consider it to be a factor restricting the growth of agricultural production? Have any remedies been tried and with what results? Can you suggest any remedies?

(iii) Are the cultivating classes rack-rented in any areas of your province? Have any remedies been tried? If so, with what results? Can you suggest any remedies?

Abstract of replies

1. *Bengal.*—(i) There is no doubt that there is an increasing tendency for ownership of land to pass out of the hands of the cultivating classes. The transferees may be either non-agriculturists or agriculturists who have already got more land than they could cultivate directly. There is no reason to suppose that the tendency has been arrested or reversed; and it may be presumed to have been rendered worse by the Bengal Tenancy (Amendment) Act of 1938 which, by removing restrictions on rights of transfer, has greatly facilitated the passing of lands out of the hands of *bona fide* cultivators.

(ii) Absentee ownership has been increasing and is an evil because it has resulted in cultivation being done by indifferent agriculturists or rack-rented *bargadars* or under-tenants. No remedial measures have been tried. Possible remedies are stated to be (*a*) the provision of each agricultural family with an economic holding from which it can earn its livelihood, and (*b*) the interdiction of all kinds of transfer of agricultural lands to non-agriculturists.

(iii) Bengal Government have not commented on the rack-renting question so far as it relates to tenants at will. The views of the Land Revenue Commission on the *barga* system were as follows: "The system has many advantages. When a share of the crop is paid, fluctuations in the cash value of the produce have no application and whether there is a good or bad crop the amount paid varies with the outturn. The system is of great assistance to widows, minors, and other people who are temporarily incapacitated from agriculture. Such people would be great losers if their only way of getting their lands cultivated without losing for ever the right to return to it was the employment of labour hired by the day or the month. The disadvantages are as follows: The *barga* system overrides the principle that the tiller of the soil should have security and protection from rack-renting. No one denies that half the produce is an excessive rent. Further, the balance of opinion in all countries is that this system of cultivation is not economic and, therefore, not in the interests of the community as a whole. The cultivator only gets the benefit of half the value of any increase in yield, which is the reward of his own labour or enterprise. If the crop is even a partial failure, he does not earn the cost of cultivation." The Commission, therefore, recommended that *bargadars*, who supply the plough-cattle, and agricultural implements should be treated as tenants and protected as under-ryots are protected—without necessarily all the rights of occupancy. The Commission further recommended that the share of the crop, legally recoverable should be reduced to one-third instead of half, although it was recognized that there would be practical difficulties in enforcing the limitation.

2. *Bihar.*—(i) There has been a tendency for ownership to pass out of the hands of petty cultivators to bigger cultivators and others who employ hired labour. This has been checked to some extent as a result of the recent rise in prices but might increase again after the war when prices will fall, unless the prices of agricultural products were stabilized at an economic level and subsidiary occupations are provided for small holders.

(ii) Absentee ownership of land is rather increasing but it has not restricted agricultural production except in so far as it has resulted in neglect of sources of irrigation. The problem has not yet assumed such proportions as to call for special remedies.

(iii) There is practically no rack-renting in the province. Tenants who hold *Bakasht* lands or are under-ryots of big cultivators are the only class who can be said to be rack-rented. This has been controlled by tenancy legislation and no remedies seem to be called for at present.

3. *Orissa.*—(i) There are reasons to believe that the right of free transferability of land has prejudicially affected the small cultivators. At present there is no noticeable tendency for ownership of land to pass out of the hands of the cultivating classes to non-cultivating classes, but there is a tendency for land to pass from small cultivators to big cultivators or to persons who are men of professions as well as cultivators. Remedies suggested are (*a*) cheap credit and supplemental employment to small cultivators, and (*b*) restrictions on rights of transfer including prohibition of transfer by small holders.

(ii) There is a growing tendency for occupancy ryots and other tenants getting income from their land without cultivating it. Sub-letting to under-ryots by persons living far away from the village in which their lands are situated is on the increase. Such absenteeism is a factor restricting the growth of agricultural production because the under-tenant does not take sufficient interest in the land. No remedies have been tried. Possible remedies suggested are (*a*) legislation providing right of occupancy to under-tenant in respect of lands under his cultivation for a number of years and (*b*) ejectment of owner from lands which remain fallow without sufficient reasons for a number of years consecutively.

(iii) A considerable area is held on produce-rent, of which the commonest form is the equal division of grain as well as by-products. There is a less common form under which a fixed quantity of the produce is paid. Under both the systems tenants are rack-rented as they are made to pay rent generally at half the gross-produce, which in money

represents more than three times the average cash rent in normal times and about eight times at the present prices of paddy. No remedies have been tried. Possible remedy suggested is amendment of tenancy laws prescribing a maximum of one-third of the gross-produce as the legally recoverable rent. The Government of Orissa have also stated "No step has been taken to check absentee landlordism nor is it very necessary to do so. What is required is to place some statutory obligations on the proprietors to effect improvements in agriculture and not to depend on the possibility of development which landlords, induced or compelled to live on their estates, might voluntarily make." [1]

4. *Assam.*—Transfer of land to non-cultivating classes is not appreciable. There is no substantial absenteeism, but there is rack-renting in the zamindari areas, for which the abolition of the zamindari system is the only remedy.

5. *Madras.*—(i) An investigation of transfers during the period 1931 to 1934 showed that about 20 per cent of all the areas transferred went to non-agriculturists, while a very large proportion went to big absentee landholders, particularly agricultural money-lenders. This was the result of foreclosure on debts. A definite reply cannot be given as to whether the tendency has been curbed or not in recent years. The indications are that the tendency has decreased.

(ii) There is definite indication that absentee ownership of land was on the increase. It is no doubt an important factor tending to restrict production since neither the absentee landlord nor his short-term tenant is interested in investing capital on the improvement of the land or the adoption of intensive methods of cultivation. No remedies have been tried. The only remedy seems to lie in the formation of co-operative farming societies.

(iii) It cannot be said whether the cultivating classes are rack-rented generally in any area in the province, as sufficient information is not available. There is nothing in the law to prevent the tenant of the ryotwari ryot or of an occupancy ryot or of an *inamdar* possessing both *warams* in the land, being rack-rented. More research into tenancy conditions is necessary.

6. *Bombay.*—(i) One of the results of agricultural indebtedness is the transfer of land from the cultivating classes to the non-cultivating classes. The process is, however, slow and is checked by the Dekkhan Agriculturists' Relief Act, the Agricultural Debtors' Relief Act, and by the introduction of the restricted tenure.

(ii) Absenteeism is a factor restricting production because the absentee landlord cares only for his annual rent and takes no interest in the improvement of his lands or the introduction of improved methods of cultivation. The tenant who cultivates lands on lease, which is generally annual, is not sure how long the lands would remain in his possession. If he sows improved seed or puts in good manure or extra labour to improve the land, half of the increased produce so obtained at his cost goes to the landlord and thus the tenant does not get a proper return for his labour and enterprise. The Tenancy Act was passed in 1941 in order to give stability to the existing tenants and encouragement to take interest in the lands leased to them. Under this Act, the landlord cannot resume lands from the existing tenant for a period of ten years and cannot increase his rent except for improvements carried out at his expense. The Act has been applied to selected areas to begin with, and it is proposed to extend it to other areas.

(iii) While rack-renting is not the general rule, it is true that in many areas the landlord receives more than the reasonable rent. The Tenancy Act provides an opportunity to the tenant to have a reasonable rent determined by a revenue officer and the levy of an illegal revenue or forced labour or services is prohibited.

7. *Central Provinces and Berar.*—(i) There was an increasing tendency for ownership of land to pass out of the hands of cultivating classes, but this has been checked by the Debt Conciliation Act, the Money-lenders' Act, the Relief of Indebtedness Act, etc. There is now a tendency for ownership of land to go back to the agriculturists as a result of good profits made in agriculture. In Berar, most of the lands bought up by co-operative banks have been sold back to the agricultural classes.

[1] The reference to 'landlords' is, however, to proprietors of estates who, in the main, are rent-holders. The opinion expressed is worth considering in relation to absentee landholders also.

(ii) Absenteeism is not on the increase, and the problem is not particularly conspicuous at the present moment, though it is true that lands held by absentee owners are not so well cultivated and sometimes remain uncultivated for want of proper management.

(iii) Rack-renting is not a substantial menace. The tenancy laws provide safeguards against it.

8. *The United Provinces.*—(i) Where transfers of cultivating tenures take place, the transferee usually belongs to the cultivating class, because unless he sub-lets the land, he himself cultivates it. The United Provinces Tenancy Act provides for restrictions on sub-letting and for ejectment as a penalty for sub-letting in contravention of the Act. The recent working of the Tenancy Act shows that ejectments of tenants giving sub-leases in contravention of the Act have been rather large. The Act provides an effective check against the transfer of cultivatory right to non-cultivating classes.

(ii) The United Provinces Tenancy Act provides for a tenant's holding being treated as abandoned in certain circumstances. This, together with the restriction on sub-letting, provides sufficient safeguard against absentee tenants leaving their holdings so uncared for that agricultural production might suffer. No further remedies are required.

(iii) Apart from stray holdings here and there, it is doubtful whether there is any area in the province in which it can be said that the cultivating classes are rack-rented. The provisions of the United Provinces Land Revenue Act and the United Provinces Tenancy Act provide a fairly effective control against rack-renting in general.

9. *Punjab.*—(i) In the last quarter of the last century, there was an increasing tendency for the ownership of land to pass out of the hands of the cultivating classes to non-cultivating classes. It was checked by the Punjab Alienation of Land Act, 1901, which restricted the rights of transfer from the agriculturist to the non-agriculturist ryots. Further restrictions have been placed by an amendment of the Act in 1938.

(ii) Without making special enquiries, it is not possible to say for certain whether absentee ownership is increasing. There is no doubt that absentee ownership has an adverse effect on land improvement and agricultural production. No remedies have been tried. Possible remedies cannot be suggested because it is a very controversial question which requires careful consideration.

(iii) Undoubtedly the cultivating classes are sometimes rack-rented. No enquiry has ever been held to determine the extent of this rack-renting, and it is, therefore, not possible to say how prevalent this evil is nor whether any special remedies are required. The whole question of tenants' rights and treatment of tenants is a very controversial one on which no opinion can be expressed without fuller consideration.

10. *Sind.*—(i) The position about transfer of land to non-cultivating classes was never particularly serious; it seems to have disappeared at present because of the greater holding power of the owners, and in order to check whatever tendency there may be in future, a Land Alienation Bill is at present being conducted to its final stage in the legislature.

(ii) Absenteeism is recently on the increase on account of the Hur troubles, and only the complete eradication of the Hur terror can be expected to remedy this. Before these troubles, absenteeism was decreasing, and owners were taking more active interest in the development of their estates.

(iii) Rack-renting is not a possibility under the Sind Crop-sharing System owing to the shortage of agricultural labour.

11. *North-West Frontier Province.*—(i) Since the introduction of the Land Alienation Act to all districts of the Province, there has been no tendency for agricultural lands to pass to non-agriculturists.

(ii) Absenteeism is not increasing and is insignificant. Where owners are absent, they are in every case represented by a close relation who arranges for the proper cultivation of the land.

(iii) Rack-renting is an unknown feature in this Province because the tenants receive a share of the crop varying from one-third to two-thirds of the produce according to local conditions.

D.—Reform of Land Tenure

Question

The view has been expressed that unless changes are made in the prevalent systems of land tenure, it would not be possible to secure any significant increase in agricultural production or significant improvement of the standard of life of the cultivating classes. Do you agree with this view? If so, discuss in relation to each system of land tenure prevalent in your Province, those aspects which, in your opinion, are objectionable as tending (*a*) to prevent extension of cultivation or irrigation or (*b*) to prevent the adoption of improved methods of agriculture or (*c*) to prevent the cultivator from securing a fair return for his labour and enterprise. Outline the changes which you consider necessary and the measures by which such changes can be brought about.

Abstract of replies

1. *Assam.*—Parts of the Province (e.g., the Assam Valley) are under temporary settlement. The Government are of the view that "while the ryotwari tenure induces increased production, the opposite is the case in zamindari areas." In view of a "general feeling of insecurity" under the zamindari system, its total abolition is advocated.

2. *Bengal.*—The Government of Bengal have replied as follows:

The Land Revenue Commission in their report, which was submitted in 1940, has examined the existing land system of Bengal in its various aspects with special reference to the permanent settlement and its effects on the economic and social structure as well as its influence on the revenues and administrative machinery of the Province of Bengal. In the opinion of the majority of the Commission the disadvantages of the existing system are as follows:—

(1) The existing system has rendered land revenue almost entirely inelastic for about 150 years and the share which the Government ought to receive from the produce of the land is substantially less than the share taken in Provinces where there is no permanent settlement and where lands are less productive than it is in Bengal.

(2) It has deprived the Government of the benefit of more valuable crops and higher prices and of any share in the increase in the value of land due to increase of population and extension of cultivation or growth of towns and the development of trade and industries the benefit of which is appropriated by a few. Government also does not get any share in the profit from mineral rights and fisheries in certain navigable rivers.

(3) It has resulted in inequalities of assessment having no relation to the productive capacity of land.

(4) The system has deprived the Government of the close contact with and intimate knowledge of rural conditions which the ryotwari system affords.

(5) It has imposed an "iron framework which has had the effect of stifling the enterprise and initiative of all classes concerned" with the result that the efficient landlord-tenant system as visualized by Lord Cornwallis has not been realized. On the other hand, the "evils of absenteeism, and management of estates by unsympathetic agents resulting in unhappy relation between the landlords and tenants have grown to such an extent that Government has been compelled to employ for the protection of the tenants a more stringent measure of legislation than has been found necessary in temporarily-settled areas."

(6) It has permitted the creation of a number of intermediaries between the zamindar and the actual cultivator none of whom have either the incentive or the power to provide any effective means for improvement of agriculture. The Government also finds little inducement to spend public money on agricultural development, as the benefit of the improvement goes into private hands, with the result that improvement of agricultural land is nobody's concern.

(7) The number of rent receivers is ever on the increase while there is a steady reduction in the number of cultivating owners of lands and the dispossessed cultivators are swelling the number of *bargadars* or of landless agricultural labourers.

(8) The complexities of the existing system have led to an immense volume of harassing and expensive litigation between the landlords and tenants and in the privately-managed estates, illegal collections still represent an appreciable addition to the burdens of the cultivators.

(9) In permanently-settled areas it is virtually impossible to secure remission of rents in areas affected by drought, flood or other natural calamities.

(10) So long as the zamindari system remains, it will be difficult to evolve any satisfactory arrangement for revising rents all over the Province on an equitable basis and for maintaining the records-of-rights. It is also doubtful if under the existing system, the legislature would ever agree to provide a really efficient machinery for realization of rent with the result that arrear rents would go on accumulating and there will be a complete breakdown before long. The stability and security of the land system has already been threatened by the development of no-rent mentality amongst the ryots in certain areas.

For the reasons summarized above the majority of members of the Commission are definitely of opinion that whatever may have been the justification for the permanent settlement in 1793, it is no longer suited to the conditions of the present time and that no other solution than State acquisition of the interests of all classes of rent-receivers on reasonable terms will be adequate to remedy the defects of the existing system. They are convinced that in order to improve the economic condition of the cultivators, the permanent settlement and zamindari system should be replaced by a ryotwari system. In that case Government as a sole landlord would be in a much stronger position to initiate schemes for (1) consolidation of holdings, (2) restoration of economic holdings, (3) provision of grazing lands, and (4) prevention of transfer of land to non-agriculturists. Government management, although it might not be universally popular, will certainly be more efficient and more in the interest of the agricultural population than zamindari management.

The Provincial Government add: "The minority view on the other hand is that socially, economically and financially, State acquisition would be a hazardous experiment and that no such scheme can be supported unless it can be clearly demonstrated that the cultivator will benefit by it. They hold that the present economic difficulties of the cultivators in Bengal are unconnected with the land revenue system. They are mainly due to (1) increasing pressure of population, (2) the Hindu and Muslim laws of inheritance, and (3) under-employment of the cultivators. These are the problems which would have to be faced whatever be the nature of the land revenue system of the country. On the other hand, under the existing system the occupancy ryots in Bengal pay lower rate of rent but enjoy greater privileges and protection than the tenants in other Provinces. As regards sub-infeudation, it is contended that it has led to a wide distribution of agricultural income and has given an interest in land to many of the middle classes. By State purchase they will be cut off from all connections with the land. This would inevitably lead to a social upheaval. The number of big landlords is very small; by far the largest majority own small estates and tenures and the compensation that they will receive will be insufficient to induce them to invest their money in industrial concerns. They will either squander the money or re-invest it in land by purchasing occupancy holdings and the result would be that a form of landlordism would again develop on a lower scale. Another grave danger of State landlordism is that the level of rent may become the subject of electioneering campaign as the tenants' votes now control the legislature."

As regards the economic condition of the cultivators, the Government say: "It must be pointed out, however, that as far as the different classes of estates in Bengal are concerned, there is no substantial difference in the economic condition of the cultivators. The principal impediments to extension of cultivation and adoption of improved methods of agriculture are—

(1) existence of a large number of intermediaries between the zamindar and the actual cultivator;

(2) ever-increasing pressure of population on agricultural land which has created an agricultural population—the majority of whom possess small-sized uneconomic holdings as there is not enough land to go round;

(3) excessive fragmentation and subdivision of holdings caused by the operation of the Hindu and Muslim laws of inheritance; and

(4) unrestricted right to transfer or sub-let.

These drawbacks are common to the three systems of land tenure prevalent in this Province (viz., the permanently-settled estate system, the temporarily-settled estate system, and estates held direct by Government). In Government-managed estates, although some extension of cultivation has been brought about by the system of colonization, it has not been possible to undertake any large-scale scheme for improvement of agriculture. There is nothing, however, to prevent a cultivator from securing a fair return for his labour and enterprise although for reasons stated above the average cultivator has not much scope for enterprise."

Concluding, the Provincial Government state that they " have already considered the principal recommendations of the (Land Revenue) Commission regarding State purchase of zamindaris and have accepted the principle of bringing the actual cultivators into direct relation with Government by acquiring the interests of all classes of rent-receivers on reasonable terms. Necessary action to implement the decision is proposed to be taken as soon as normal conditions have returned in the country."

A professor of economics agrees " that no significant increase in crop production in Bengal will be possible without a thorough overhaul of the present system of land tenure." According to him, " the present system should be abolished by buying off all the intermediate interests on the lines recommended by the Floud Commission and direct relationship should be established between the State and the cultivator. The land tenure system should be as follows: (1) The cultivator should have heritable and transferable right in the land, subject to good cultivation, sale or transfer to non-cultivators being prohibited. (2) Good cultivation, among other things, will consist of collective farming according to the directions given by the State from time to time. (3) The minimum size of a collective farm should be 1,000 bighas. (4) The net income of the collective farm should be subject to an income-tax, in lieu of land revenue, the total assessment being divided *pro rata* among the members of the collective farm. (5) All collective farms should be knit into an ascending series of multi-purpose co-operative federations through the union, the thana, the district and the Province."

Another non-official view is as follows: " If we assume the State acquires all the rights in land, it follows future land tenancy should be looked upon as a form of trusteeship and the trustees permitted to remain in office only so long as they carried out faithfully the terms of the trust deed (their lease) . . . Supposing we take an imaginary area of 1,000 acres available for handing over to trustees to work in the interest of the community as a whole. There is no special virtue in 1,000 acres, the area might be smaller or larger, though if it were much smaller it is doubtful whether a correct balance could be maintained. All the people in the area should be offered an opportunity to combine in the benefits to be derived from the trusteeship, in some form of co-operative society. They would not all be required to work on the land, some would be blacksmiths, others teachers, others technicians, artisans, doctors, in fact, everybody necessary for the life of an organized community willing to contribute his or her talents for the common good in exchange for a guaranteed share of the benefits to be derived from trusteeship of the 1,000 acres. Would not the agriculturist jump at the chance,—the teacher, the doctor, the blacksmith? Next it would be necessary to delegate power from the trustees to a small selected body of their number, a panchayat. This panchayat would be required to chalk out a programme whereby the balance between wood land, arable land, pasture land, water-supply, fallow land, animal could be restored to the area as quickly as possible. Fields would be enclosed, in many cases by quick-growing hedges, cows tethered and fed by cut grass grown specially for fodder, the best plants selected to provide seed, cattle bred only from the best bulls; in fact, the panchayat would set in motion a programme for improvement such as set out in Brayne's " Better Villages." Every area

of 1,000 acres has the men capable of putting in motion such a programme—it only needs our leaders to have the vision and the courage to give them a chance. If a start is made with leguminous crops there need be no fear of the land failing to do its part. No attempt will be made here to set out desirable crop-rotations as they must depend on local conditions to a considerable extent. There is no doubt the wise men in the villages know the correct rotation—in another generation or so the knowledge will be lost unless there is a radical change in land tenure system. With it will go our civilization . . ."

A Divisional Commissioner in Bengal takes the view that "changes in the land tenure will not effect any great improvement in agricultural produce, because the chief obstacle is the poverty of the bulk of the cultivators . . . It is the pressure of population on the land, the smallness of the holdings which prevents the agriculturist getting what appears to be a fair return. Big farms could be run profitably. On the other hand, the agricultural economy of Bengal is primarily not based on cash values . . . and it is only when the outturn and costs are put on a cash basis that the return does not seem to be adequate. In other words, only when standards not consonant with the agricultural economy of the Province are applied, does the return seem unfair. But it may be admitted that much of the agriculture is economically unsound for reasons already mentioned."

3. *Bihar.*—The Government's reply is as follows: "The view that unless changes are made in the prevalent systems of land tenure, it would not be possible to secure any significant increase in agricultural production, is in accord with facts. In this Province, most of the estates are permanently settled. In theory, this ought not to stand in the way of improving agricultural production, but it does in practice . . . The other view that no significant improvement in the standard of life of the cultivating classes is possible without a change in the system of land tenure has also much to support it . . . It is not so much for its inherent defects as on larger grounds of public interest ably summarized by the Floud Commission that its abolition should be seriously considered by the State. The Floud Commission has shown that its liquidation can be effected in an orderly manner as a business proposition . . ." The Provincial Government go on to state: "On the other hand, it should not be understood that the mere acquisition by the State of all intermediate proprietary interests between the ryot and the State will by itself lead to either increased agricultural production or improve the standard of life of the cultivator. The Government khasmahals are not conspicuously superior to many private estates, nor is the standard of life of a ryot in ryotwari Provinces much superior to that of a ryot in permanently-settled areas. The acquisition should be followed by large-scale reorganization of agriculture including co-operative farming, large-scale irrigation and intensive and widespread application of all the well-known methods of agricultural development, besides providing outlets for surplus agricultural labour. There should also be extensive education, health and other facilities and amenities and the huge loss of wealth or capital caused by epidemics among men and cattle must be prevented. The increased resources of State should render all these possible."

An officer of the Government of Bihar takes the view that "mere changes in the system of land tenure will not bring about a significant increase in the productivity of the soil or the standard of living of the cultivator. Though tenants-at-will hold land on most insecure terms and have to pay the highest rent per bigha, yet his yield per bigha is not much less than that of the occupancy tenant. Again, the yield from mokarari land (where the amount of rent is fixed) is not much less than that of occupancy land which is subject to enhancement of rent. The impediments to improvement of cultivation are conditioned not so much by the system of land tenure followed, as by the smallness and fragmentation of holdings, want of capital and want of knowledge of better methods of cultivation."

A non-official from Bihar is of the following opinion: "Generalization will be misleading. The present land tenure system, in some cases, is useful, in others harmless, but in some cases positively injurious. Since the permanent settlement, the laws of inheritance have resulted in considerable division of property, and petty landlords scattered over a

large area have sprung up. The petty landlord is too poor to introduce improved methods of cultivation. In the case of big landlords whose proprietary interest extends over a considerable area, lack of improvement is due to utter neglect or disregard. The sub-infeudation of the proprietary interest, by itself, does not impair cultivation. But here again it is a question of diversion and subdivision which hampers any co-ordinated effort. I do not think the land tenure system prevents the cultivator from securing a fair return for his labour and enterprise except in those areas where the produce rent is still in force, but here again the system is not an unmixed evil. . . Abolition of all the interests between the cultivator and the Government and consolidation of holdings or the introduction of joint farming are the methods which had been suggested for bringing about improvements. Each has its advantages and disadvantages. Wholesale acquisition of the zamindari in Bihar is, in my opinion, neither very practicable nor will it be wise. . . I am, however, of the opinion that the days of the zamindari system are numbered and sooner or later it will end. I would, therefore, suggest a cautious and gradual acquisition of the zamindari rights. A beginning may be made by acquiring lands of petty landlords in villages where there are a large number of co-sharers. The land in direct cultivation by the landlords may be left to them after fixing a reasonable rent. For this purpose, regions may be selected and operations started. After some time, the policy may be extended further so that the change may be gradual and without disturbing the prevailing social structure."

4. *Bombay.*—The Government have replied as follows: "The view is generally correct with regard to all tenures where lands are leased to tenants for cultivation on payment of annual rent. The tenant who cultivates lands on lease, which is generally annual, is not sure how long the lands would remain in his possession as the landlord has power to resume the lands at the end of the year after giving three months' notice to the tenant. The tenant has thus no permanent interest in the lands. In many cases lands are leased on the crop-share rent and if the tenant sows improved seed or puts in good manure or extra labour to improve the land, half of the increased produce so obtained at his cost goes to the landlord and thus the tenant does not get a proper return for his labour and enterprise. The absentee landlord cares only for his annual rent and takes no interest in the improvement of his lands or introduction of improved methods of cultivation. With a view to give some stability to the existing tenants and to encourage them to take interest in the lands leased to them, the Tenancy Act was passed in 1941. Under this Act the landlord cannot resume lands from the existing tenant at least for a period of ten years and cannot increase his rent, except for improvements carried out at the landlord's expense. The Act has been applied to selected areas to begin with and it is proposed to extend it to the other areas in course of time. Under the Act the position of the tenant is secure and he is encouraged to put in extra labour and cost for the improvement of the lands leased to him with a view to get a better return for himself. The question of applying the Tenancy Act to the predominantly khoti areas of Ratnagiri and Colaba and of amending the Khoti Act to give the tenants more security and make them independent of the Khoti is under consideration."

5. *Central Provinces and Berar.*—Government agree that changes in the prevalent system of land tenure might well secure an increase in agricultural production, but the effect on individual standards of life is difficult to prophesy. The system of land tenure in the province offers security to the cultivators, and whilst interference with it might stimulate agricultural production, the effect on the structure of rural society, and the relationship between capital and labour, might not be altogether beneficial. It must be remembered that this is a backward province where the ignorant would be easily exploited without the protection which the Land Revenue and Tenancy Acts afford.

6. *Madras.—The Board of Revenue, Madras,* have stated as follows: "The ryotwari system does not need changing. Its defects are attributable to the systems of law existing in the province which encourage the excessive partition of land and to the fact that it gives no security of tenure to the actual cultivator unless he is the registered holder. These defects could, however, be cured by appropriate legislation with no disturbance to the system.

The zamindari system is defective in that the upkeep of irrigation works is often beyond the financial power of zamindars and that if there is any dispute about the repair of an irrigation work or the amount of rent payable, litigation has to be resorted to. Cultivating tenants under occupancy ryots suffer from the same disadvantage of insecure tenure as cultivators under ryots. In summarizing the results of the resurvey of selected villages conducted under the direction of the Department of Economics of the University of Madras, Messrs. Thomas and Ramakrishnan observe as follows: 'It is worthwhile stressing the recent tendency in almost all the villages for owners to cultivate less and less either with their own hands or with the help of paid farm-servants and for more lands to be let on lease.' Many resident ryots too are less inclined to cultivate their holdings either by themselves or with paid farm-servants.' In the absence of much fuller information than we have at present regarding the economics of farming and the relations between actual cultivators and owners it is difficult to suggest any changes.

The zamindari system, however, appears to have outlived such usefulness as it may once have possessed and many zamindars even would welcome its abolition subject to reasonable compensation for the loss of their rights.

The relations between the landholder and the tenant in the Malabar district are now governed by the Malabar Compensation for Tenants' Improvement Act, 1899, and the Malabar Tenancy Act, 1929. In July 1939, the Government appointed a committee to study the nature and effects of the land tenures prevailing in the Malabar district and in adjacent areas and to suggest for the consideration of the Government such legislative measures as it might consider necessary for the regulation of tenancy and similar relations in these areas. The Committee submitted its report in 1940 . . . The Committee recommended that there should be a fixity of tenure for all classes of lands subject to certain exceptions, that the grounds of eviction of tenants should be restricted, that no tenant should be compelled to pay more than a fair rent, that the fair rent should be determined on the basis suggested in their report, that the practice of having renewal deeds executed every 12 years should be abolished altogether, that the renewal fee should be reduced and divided into 12 equal instalments and added on to the rent and made recoverable as rent, that tenants should be entitled to claim the value of any improvements effected after the passing of the intended tenancy legislation, and that some general control should be exercised to prevent denudation of private forests. The consideration of the Committee's report has been deferred for the duration of the war."

The Director of Agriculture, Madras, has expressed his views as follows: "The system of land tenure is no doubt a great factor in explaining the prosperity or the adversity of the cultivator. But it is possible to exaggerate its influence. In the United States, it has been found after an elaborate enquiry that 'efficiency is less a matter of the class of tenure than it is of the personal qualities of the farmer, the character of land, the adequacy of farm equipment and operating capital.' Of course, in the United States, land is not such a scarce factor as in India. Hence the competition for land by too many cultivators in this country does lead to graver evils, than in the United States. But it is good not to ignore the other factors quoted above making for efficiency.

Agitation to repeal the zamindari (or permanent) settlement is developing all over the country. It has been accepted as a policy by the Government of Bengal, the former Government of Bihar, etc. The Provincial Legislature, according to the Government of India Act, 1935, is not prohibited from passing a resolution to that effect and getting the sanction from Parliament.

This is bound to be done in almost every province as there is a growing consensus of opinion in its favour even among the zamindars themselves. The only serious difference of opinion is on the nature of compensation to be given to the zamindars for the rights they have long enjoyed and will be asked to surrender. If this is done, and ryotwari system extends over the entire province, there is no doubt that there

will be an improvement in irrigation facilities, the maintenance of the record of rights, the establishment of co-operative societies and the extension of the activities of the Agricultural Department.

This does not mean that there is no problem of tenure in ryotwari areas. As stated already, there are a growing number of tenants who take land on lease, and are liable to be evicted at the end of a crop season or two. The Damocles sword is always hanging on them. Some sort of security must be given to them against evictions after a short period. Fair rents must be fixed according to the nature of the land, crop, etc., which would not only enable the cultivator to subsist but leave a margin which in course of time would enable him to purchase land and rise in the agricultural ladder.

This is not quite a chimera even in India. Tenants who take on lease land for intensive cultivation of crops, like sugarcane, plantains, tobacco, cambodia cotton, turmeric, etc., invest a lot of capital and are quite enterprising and making decent profits. They would not indeed care to remain on the same land as tenants for a long period. They move from one land to another and try different pieces. These are, however, exceptional and are few in number. That is why they are not among the exploited."

A non-official from Madras has stated as follows: "Landholders governed by the Madras Estates Land Act have not shown sufficient enterprise to bring more land under cultivation. Nor have they tried to improve the water resources and other facilities. Even under the 'Grow More Food' campaign, some zamindars were reluctant to permit cultivators from using cultivable waste . . . and the Government of Madras enacted the Madras Estates Land (Temporary Amendment) Act, 1944. . . In fact, the zamindari system has become an anachronism. The Madras Estates Land Act needs complete revision, if not, complete erasure from the Statute Book.

Under the ryotwari system there is security of tenure and the share of the State for the produce is fixed . . . At present there is no distinction in regard to land revenue assessment between the small holder and the large landholder. This is a direction in which a reform of the land revenue system may be thought of . . . Cultivating ownership should be conferred on all ryotwari tenants especially where the landlord is an absentee landlord, and restrictions regarding increase of rent, etc., should by law be imposed . . ."

7. *North-West Frontier Province.*—The Provincial Government is of opinion that the principal cause of agricultural backwardness is unprofitable debt and the lack of capital—rather than the system of land tenure, . . . The unit of agriculture is the village estate, in the midst of which is situated the village *abadi*. The village comprises a complete agricultural brotherhood with an elaborate customary law of its own. There is an increasing tendency for the partition of village holdings amongst the proprietary body, which leads often to the fragmentation of the estate. In most cases, the proprietors are themselves aware of the harm of this fragmentation, and whenever they can overcome their disputes and prejudices seek consolidation. Except for fragmentation of holdings consequent on partition and inheritance, the Provincial Government does not consider the existing forms of tenure objectionable and in any case can perceive of no way of substituting any other form of tenure.

8. *Orissa.*—The Provincial Government has expressed its views as follows: "While it is not necessary to bring about any radical change in the prevalent system of land tenure, it must be admitted that the zamindars in general, whether of permanently-settled estates or temporarily-settled estates, not only do not introduce any improvement to get better yield or to protect the lands from floods or drought but exploit every opportunity for realization of enhanced rent or other dues from the tenants. No doubt, cultivators will have a better protection, so far as security of their tenancy and rent is concerned, under the ryotwari system of land tenure which will in its turn encourage them to improve their holdings and obtain better yield; but the only possible remedy is to abolish the zamindari system altogether which, however, does not seem to be a practical proposition at least for many years to come,

involving as it does extinction of ancient and vested rights. A better course which may be adopted at present is to compel the zamindars, specially of big estates, by legislation to set apart a certain amount every year for providing irrigation facilities and protective works.

Partition of zamindaris into very small portions tends to increase fragmentation of the holding. It also tends to impoverish the zamindars some of whom become proprietors of so small parcels of lands and have to collect rent of such small amounts that the ownership of the property ceases to be economic. Such zamindars can do nothing for improvement of cultivation in their estates. It may, therefore, be laid down that no estate having a land revenue below Rs. 500 should be admitted to partition."

9. *Punjab.*—The Government have replied as follows: "The view cannot be accepted in its entirety. The law of inheritance, the annual growth in population and lack of large scale industry in the Province have gradually led to fragmentation of holdings and increasing pressure on the land. The social customs and prejudices and deep-seated conservatism of the average cultivator are a great hindrance in the way of increased agricultural production or an increase in his purchasing power. The landlord has not taken to mechanical farming and still looks to Government for a lead. His net profits from cultivation through tenants are comparatively higher and therefore he tends to feel satisfied and to show insufficient interest in extension of cultivation or in improvement of land or its method of farming. The peasant proprietor wastes much of his labour by cultivating scattered fields and can effect no extension in cultivation as he cannot provide irrigation for each of his fields. The tenants are sometimes rack-rented, poor and insecure and consequently have neither the means nor the necessary incentive to effect improvements."

10. *Sind.*—Government does not entirely agree with the view quoted in this question with reference to conditions in Sind, the most striking of which from the present point of view is the low population figure. It admits that the tendency towards absenteeism (such as it is), the five-year lease system, and the tendency of the more substantial zamindars to get hold of more land than they can properly exploit are drawbacks, though they do not at present operate very seriously on Sind's general economy, but until the pressure of population begins to make itself felt in Sind the system gets as much out of the land as the quantity and quality of the labour available permit, and shields the cultivating classes from many evils.

11. *United Provinces.*—The Government's views are as follows: "The theoretical view expressed in the opening sentence of this question curiously finds support from both extreme schools of thought whether pro-landlord or pro-tenant. The former take the view that if all the tenants' rights are wiped out and the landlords are allowed to deal with cultivation as capitalized farmers, much more agricultural production and also improvement in the standard of life will be possible. On the other hand, the tenant school would argue that, if the whole class of existing proprietors is eliminated, the standard of life of the cultivating classes would automatically go up and the incentive which the acquisition of a higher status of peasant proprietors would provide to the cultivating classes themselves would bring about an immense improvement in agricultural production. A third school of thought holds that if complete ownership of land by the State and collective farming are established, it would bring about a very great increase in agricultural production and improvement in the standard of life of the cultivating classes.

All the three views are purely theoretical, and there has not been a sufficiently thorough study of the whole problem to justify the claims of any of the three schools of thought. In any case, the complete fulfilment of the ideals of any of the three views is impossible without a revolution in the sense of social values. On the whole, Government's policy, as indicated by the tenancy legislation in the Province, seems to have been to provide stability of tenure and protection from rack-renting to the cultivator as far as possible. As a result both of this legislation as well as of the working of economic factors, the cultivated area in the Province has increased from about 29·400 million acres in 1880–81 to 34·400 million acres in 1901–02 and to 36·400 million acres in 1942–43."

APPENDIX III

RURAL CREDIT AND INDEBTEDNESS

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Questions

(1) Describe the more important agencies which at present finance agricultural operations. Comment on their usefulness.

(2) Are there any restrictions placed in your province on the operation of the money-lender in order to protect the interests of the cultivating classes? Describe the nature of such restrictions and assess their results.

Abstract of replies

A.—Rural credit afforded by Governments

(i) *Assam, Punjab, and Sind.*—The Governments of these provinces have made no comments.

(ii) *Bihar.*—The part played by the Government is confined to the grant of loans under the Land Improvement Loans Act, the Agriculturists Loans Act and also to paying contribution to a number of grain *golas* who advance seed loans to the aboriginals in Chota Nagpur and the Santal Parganas and in parts of the districts of Monghyr and Bhagalpur. The amount advanced each year is small and, however useful on account of the low rates of interest, plays an insignificant part in supplying rural credit. The procedure for these loans is also unpopular on account of the formalities that have to be undergone before the loans are secured and on account of the rather rigid enforcement of collections.

(iii) *Bengal.*—In areas where distress occurs or is apprehended, loans under the Agriculturists Loans Act, 1884, are liberally distributed for purchase of seed, cattle, agricultural implements, etc., and for the maintenance of the agriculturists during the interval between the sowing time and the harvest. Loans under the Land Improvement Loans Act, 1883, are also given to landholders for excavation of old tanks and repair of irrigation bunds.

(iv) *Bombay.*—Government advances loans for current agricultural purposes under the Agriculturists Loans Act for relieving distress, for purchase of seed, fodder, cattle and other purposes connected with agriculture and not specified in the Land Improvement Loans Act.

(v) *Central Provinces and Berar.*—Apart from the usual type of *takavi* advances made in the pre-war times, special types of loans offered as a part of the "Grow More Food" drive have attracted wide attention. A large number of cultivators may possibly avail themselves of these facilities if a quicker method of providing these loans could be devised—though not at the cost of a sound system of financing.

(vi) *Madras.*—Government help the farmer with loans under the Land Improvements Loans Act, 1883, and the Agriculturists Loans Act, 1884. Loans under the former are advanced for periods up to 30 years while loans under the latter have generally a shorter period. A number of concessions and facilities have been offered under the Grow More Food campaign. Some of the loans given for purchaso of manure and seed are free of interest. Government loans are useful for financing emergency measures, and for restarting agriculture after a natural calamity such as flood or famine. Recovery of such loans is, however, difficult and in many cases the loans have to be written off and become "grants in aid." In normal times they have a limited usefulness in financing the construction of wells and other permanent improvements.

(vii) *North-West Frontier Province.*—Government loans (takavi) are given under the Agricultural Improvements Loans Act, 1883, and the Agricultural Loans Act, 1884. *Takavi* seldom produces the results for which it is given and is seldom recoverable without coercion, and often in spite of coercion, is irrecoverable. Government is constrained periodically to strike off large sums of *takavi* as irrecoverable. It is also difficult to ensure that *takavi* is applied to the purposes for which it is granted, and more often than not it is misapplied. The only satisfactory way of ensuring that *takavi* is made correct use of would be for works of improvement to be undertaken by Government or supervised by Government

agency, and plough cattle supplied direct to those requiring them. This, however, is impossible under existing arrangements and with the staff at present available.

(viii) *Orissa.*—Government use to finance agricultural operations by distribution of takavi loans under the Agricultural Loans Act and the Land Improvement Act at the time of flood, drought, or other natural calamities. Since the inauguration of the Grow More Food campaign, loans for agricultural operations have also been given to a very considerable extent.

(ix) *United Provinces.*—In respect of *takavi*, while it played a great part in the past in providing relief to distressed cultivators, and will continue to do so in the future, it appears desirable that monetary transactions of a business nature should be handled by special credit institutions like co-operative banks and agencies of this description.

B.—Rural credit afforded by co-operative societies

(i) *Assam.*—No comments have been made by Government. One Deputy Commissioner says the few co-operative societies are not functioning well and that the establishment of agricultural banks is a necessity.

(ii) *Bihar.*—The co-operative societies in this province have for several years till recently remained moribund but even at the best of times they touch little more than the fringe of the population, less than 3 per cent.

(iii) *Bengal.*—There are altogether 36,000 rural credit societies with a total membership of 8·68 lakhs as on 30th June 1943. The societies advance short-term loans to meet the seasonal needs of agriculturists. These loans are limited to Rs. 25 only. A large section of the members of the old societies who have defaulted on the loans previously taken by them, are not allowed these loans. On the average of five years ending 1942–43, the amount of short-term loan issued each year was Rs. 38 lakhs. It is estimated that the annual requirement of the agriculturist families in Bengal in the form of short-term loan and intermediate term loans repayable within five years is about Rs. 15 crores. The internal condition of the Co-operative Rural Credit movement is not at the moment flourishing, and capital will have to be largely found by Government till such time as the movement is reorganized and placed on a sound footing and public confidence is restored.

(iv) *Bombay.*—The part played by the co-operative societies in financing of agriculture is considerably smaller than that of the *sowcar* or the *quasi-sowcar*, such as the landlord and the wealthy agriculturist. They have not been very successful in encouraging thrift and in most cases the co-operative society is regarded as an additional *sowcar* as there is no limitation on the member's right to borrow from other sources.

(v) *Central Provinces and Berar.*—Co-operative credit societies continue their task of providing loans at reasonable rates of interest and loan money to individuals who are members, with due attention to their repaying capacity. A number of societies which suffered heavily during depression years owing to deficits and poor repayments have revived.

(vi) *Madras.*—Co-operative societies lend money for meeting cultivation expenses, payment of Government or *zamin hist*, etc. Such loans are repayable from the next harvest or within one year from the date of the loan. They lend also for periods up to three years for discharge of petty debts, purchase of country carts, implements, cattle, etc. Some societies advance loans under a scheme of controlled credit by which a member is enabled to get his loans in time for agricultural needs and apply them to the land and also enabled to repay the loans by selling his produce to his best advantage. The controlled credit scheme was in operation in 18 districts in the province during 1942–43. Four hundred and twenty-one societies issued cultivation loans to the extent of 6·27 lakhs and the area covered was 35,334 acres. Some of the co-operative societies worked also cotton and paddy multiplication schemes and supplied improved seeds to their members. Co-operative land mortgage banks provide finance for redemption of mortgages on and improvements of agricultural lands and for discharge of other prior debts. The maximum amount of loan which any individual member of a land mortgage bank can get is generally limited to Rs. 15,000 and the period of repayment to 20 years. Co-operative societies took part in the Grow More Food drive. As a result of their efforts and the financial assistance provided by them, 8,534 acres of land were brought under foodgrain cultivation and 1,777 acres under vegetable cultivation during the year 1942–43. In that year, the total amount

advanced by all societies was about 126 lakhs for cultivation expenses, 24 lakhs for purchase of cattle, about 10 lakhs for land improvement and nearly one lakh for purchase of country carts. An important service rendered by the co-operative credit organizations to rural finance generally is the reduction of the rates of interest charged to agriculturists and keeping them at a fair level.

(vii) *North-West Frontier Province.*—The Co-operative Department in this province is still very much in its infancy and has so far failed to secure popularity. The capital of the societies is subscribed by the *zamindars* who are the very persons in need of capital. Loans can never exceed Rs. 100 and these are recoverable after default with compound interest. They are not sufficient to make any improvements worth while and the money is more often than not misapplied. There has been and is insufficient supervision of co-operative societies and minor officials have often adopted questionable methods in securing members, the principal of which is to obtain members by offering them immediate loans. These loans and the interest due on them in many cases have to be recovered by coercion. The result has been that co-operative societies flourish for a short time in various villages and then die an unnatural death. The best method to make the co-operative movement successful would be to adopt methods similar to those amongst farmers in England and the British Dominions. Groups of farmers club together to subscribe the necessary capital to purchase agricultural implements, which are lent out to the subscribing farmers on payment of an agreed sum per day. This money is used for maintenance of agricultural implements purchased and for further purchases and replacements. This is the only satisfactory method of conducting co-operative societies.

(viii) *Orissa.*—Co-operative banks play an important part in the agricultural economy of the province. They have been financing agricultural operations from time to time by means of loans in cash or in the shape of seeds, manure and implements. Although such credit has not always been utilized for productive purposes, due to the unscrupulousness of the individual cultivators, the fact remains that such institutions have been at times extremely useful to the agriculturists. The low rates of interest and the semi-official supervision over the utilization of loans are two of the admirable features of this institution. Its usefulness as an agency for rural finance has decreased very considerably, as Government are now directly advancing money on very favourable terms in furtherance of the food production drive.

(ix) *The Punjab.*—On the 31st July 1943, the number of co-operative credit societies stood at 17,238 with a membership of 5·40 lakhs and a working capital of about 5·51 crores. Owned funds of these societies consisting of shares, reserve fund, etc., were about 2·80 crores. Deposits of members were about 42 lakhs and non-members about 30 lakhs. During the year 1942–43, these societies lent about 1·04 crores to their members, at rates which varied from 9⅜ per cent to 12½ per cent per annum. These loans were mainly given for the purchase of seed and fodder, agricultural implements and machinery, and bullocks, payment of land revenue, repayment of old debts, household and ceremonial expenses. There is great scope for expansion, as not more than half the villages have yet been touched by co-operative credit societies.

(x) *Sind.*—The co-operative movement in Sind is still in its childhood and has suffered from ineffective control over credits afforded to the members. The multi-purpose co-operative societies in the province are in the experimental stage.

(xi) *United Provinces.*—No comment on the working of the co-operative societies has been made. Land mortgage banks have not been adequate. The Provincial Government have decided to set up a Provincial Co-operative Bank which, it is hoped, will give new energy to the co-operative credit system.

C.—The Village Money-lender

(i) *Assam.*—The village money-lender is usually a Marwari combining money-lending with trade. He fills up a blank in the rural economic system and cannot be easily replaced. He poses as a friend in need to the cultivators and cannot be challenged. But he has too much of a say as to what crop the cultivator is to grow. As he is the channel for marketing, he can retard or accelerate the flow to suit his benefit rather than that of the cultivators. The Assam Money-lenders Act, 1934, and the Debt Conciliation Act, 1936, have placed restrictions on the operations of money-lenders.

The Money-lenders Act, 1943, mainly limits the rates of interest. The Government have not commented on the effects of this Act. Some Deputy Commissioners say that restrictive legislation has scared away the money-lenders.

(ii) *Bihar.*—The village money-lender is the most important agency of rural finance and cannot be easily replaced. Despite his tendency to abuse his position and have recourse to mal-practices, he fulfils on the whole a very useful role in village economy. The State should only seek to control his activities with a view to eliminate or check mal-practices—not to eliminate him, till banking facilities become available in rural areas. The Bihar Money-lenders Act, 1938, and the Bihar Money-lenders (Regulation of Transactions) Act, 1939, have placed restrictions on the operations of money-lenders, the most important of which relate to registration of money-lenders, maintenance of proper accounts by them and restriction of rate of interest. No suits for recovery of loans by a money-lender are maintainable unless he is registered. Certain provisions of the Chota Nagpur Tenancy Act and the Bihar Tenancy Act place restrictions on transfer of their rights by certain tenants and thus place restrictions indirectly on the operation of money-lenders. The two Acts on money-lending have worked generally satisfactorily. They have in the main been successful in checking rates of interest, though evasion (in the shape of showing a higher amount as principal than what is actually advanced to compensate for the lower rate of interest) is, by no means uncommon. It is doubtful whether they have in fact acted as a brake on the cultivators' habit to borrow. In the long run, the operation of the Act, discouraging advances for unproductive purposes, is expected to act as a damper on incurring what is now regarded as obligatory social expenditure and develop the social conscience. If one cannot borrow, one cannot spend. But there will be no marked improvement without education and without such economic improvement in the cultivator's condition as will remove all need to borrow. Other results of the Acts are that transfers of land tend to take place on more unfavourable terms than before; there has been reduction in the unsecured debts; and smaller money-lenders have been squeezed out of business which tends to go to the bigger and really professional men.

(iii) *Bengal.*—The village money-lenders had been the most outstanding agency till a few years ago. They are now cautious in advancing loans and have restricted their activities owing to the introduction of the Bengal Agricultural Debtors Act, 1935, and the Money-lenders Act, 1940. The Debt Settlement Boards established under the former Act have drastic powers to scale down the debts of an agriculturist strictly to his paying capacity. The main restrictions imposed by the Bengal Money-lenders Act are:

(*a*) Every money-lender must take out a licence authorizing him to carry on money-lending business;

(*b*) No money-lender may charge interest at rates higher than 10 per cent simple, on an unsecured loan or 8 per cent simple on a secured loan;

(*c*) A loan is deemed to have been discharged by payment of double the principal;

(*d*) Provision for payment of amounts due on decrees passed by courts in easy instalments;

(*e*) Prohibition of molestation.

More than 5,000 licences have been issued to money-lenders who have to keep regular account books. These restrictions have given a temporary shock to the village money-lenders who are, therefore, generally shy at the moment. In some parts of the Province borrowers have to resort to out-and-out sale deeds for obtaining credit. This, the Bengal Government say, may be said to be the negative aspect of the Act. They are of the opinion that when all money-lenders are licensed and made to comply with the provisions of the Act, " usury will be a thing of the past."

(iv) *Bombay.*—The main source of credit for the cultivator is the *sowcar*. He is concerned merely with the safety of his investment and substantial returns on them, but has no direct interest in the welfare of the borrower. The purpose for which the loan is taken is of no importance to him so long as the party to whom the loan is advanced is solvent and is in a position to repay. The rate of interest charged is generally high and once a person gets into debt it is extremely difficult for him to get out of it. Some well-to-do agriculturists also lend money but their terms are not

in anyway more favourable than those of the *sowcar* and they have always an eye on the debtor's lands. The Dekkhan Agriculturists' Relief Act attempts to safeguard the position of the agriculturist against frauds by money-lenders. There is divergence of views with regard to the purpose served by the Act. It is alleged that the credit of the agriculturist has diminished and the Act has made both the creditor and the debtor dishonest and engendered distrust on both sides. On the other hand, it has helped the agriculturist in getting relief from his unscrupulous *sowcar*. The Usurious Loans Act provides for the court to reopen an old transaction when it finds that the transaction is substantially unfair and to set aside any agreement made in respect of any loan either wholly or in part. The Act applies to both agriculturists and non-agriculturists, but the former generally take advantage of the Act which provides better relief. The Agricultural Debtors Relief Act was passed in 1939 in order to reduce the aggregate indebtedness of genuine agriculturists so as to bring it reasonably within the compass of their capacity to repay. Compulsory scaling down of the debts through the specially constituted Debt Adjustment Boards and the subsequent arrangement for the repayment of the adjusted amount in manageable instalments constitute the essence of the whole scheme. The Dekkhan Agriculturists' Relief Act does not apply to areas where the Agricultural Debtors Relief Act is in operation.

The promulgation of a Money-lenders Act has been considered on several occasions in the past, but the matter has not been proceeded with for a number of reasons. It has been more recently impressed on Government by the Provincial Rural Development Board that it is necessary to have an Act of this nature both to ensure better administration of the Agricultural Debtors Relief Act and as a post-war measure. The question has been postponed during the war owing to the unavailability of the considerable staff which would be necessary and as considerable attention on the part of the District Officers would also be required. In the opinion of Government, the primary needs are: (i) to licence money-lenders and limit their rates of interest and stop usurious practices; (ii) to curtail the cultivator's liberty to borrow and allow loans from licensed money-lenders mostly for productive purposes, a small margin being allowed for unproductive purposes; and (iii) by a system of control of crops and compulsory marketing through societies, to recover the loans promptly and save the cultivator from his own improvidence.

(v) *Central Provinces and Berar.*—The village money-lender provides the bulk of agricultural finance needed by the cultivators. The *malguzar* and big cultivators provide loans in cash and kind. The cultivator prefers to take the loan in kind and to return the seed on the *sawai* (one and a quarter) system. A beneficent *malguzar* is a source of strength to his tenants and small cultivators.

The Acts which place restrictions on the operation of the money-lenders are the Usurious Loans Act, 1918, the Central Provinces and Berar Debt Conciliation Act, 1933, the Central Provinces and Berar Money-lenders Act, 1934, the Central Provinces and Berar Protection of Debtors Act, 1937, and the Central Provinces and Berar Relief of Indebtedness Act, 1939. Every person carrying on or intending to carry on the business of money-lending is required to get himself registered and obtain a registration certificate, maintain an account for each debtor separately for all transactions in respect of any loan advanced to the debtor and is also required to furnish such account to the debtor annually. No court is allowed to decree on account of arrears of interest a sum greater than the principal of the loan. Provision is made for the amount of the decree to be paid in suitable number of instalments. Judicial administration reports on the working of the Money-lenders Act, 1934, show that the Act is working satisfactorily, although courts have come across cases of unlicensed money-lending and cases where accounts were not kept and supplied as required by the Act.

(vi) *Madras.*—It is estimated that out of the total amount advanced as loans to agriculturists, Government loans accounted for only one per cent, loans given by co-operative societies for 6 per cent, and others for 93 per cent. Agriculturist money-lenders were the biggest money-lenders, followed by professional and trader money-lenders. The village money-lender is generally easily accessible to the farmer. He mostly does not get written agreements for the small amounts lent from time to time but relies on the honesty and word of the farmer and gets his loans repaid in kind as soon as the harvest is over. The village money-lender is most useful of all the credit agencies, in financing the major part of rural

credit. He is more popular with the borrowers because he is more accommodating in demands for repayment than either the co-operative societies or the Government, but at the same time his terms are more disadvantageous to the borrower. His terms are tending to become less exacting consequent on the several control measures which have been taken and also because of the competition of the other two agencies. On the other hand, his loan operations give him a very tight control over the economic life of the village as he naturally expects his debtors to market their produce through him.

Legislative restrictions on the operations of money-lenders are contained in the following enactments:—

(*a*) *The Agency Tracts Interest and Land Transfer Act*, 1917.—This Act applies to tribal areas of two districts in the province. It provides limitation of rates of interest and requires the assent of the local officer of the Government for the transfer of immovable properties between any member of a hill-tribe and persons who are not members of a hill-tribe.

(*b*) *The Madras Debtors Protection Act*, 1935, was intended for the protection of small debtors who have borrowed loans below Rs. 500 throughout the province. It prescribes maximum rates of interest for secured and unsecured debts and requires creditors to maintain proper accounts and to give receipts to debtors for payments. This was found inadequate as it was not devised specially for the solution of the problem of agriculturists' debts.

(*c*) *The Agriculturists Loans* (*Amendment*) *Act*, 1935, provides for the distribution of State loans to agriculturists for the redemption of prior debts through a special staff appointed for the purpose. The relief afforded under the Act was infinitesimal. The scheme has therefore been suspended for the duration of the war.

(*d*) *The Madras Debt Conciliation Act*, 1936, was the result of the agrarian crisis following the economic depression and provided for voluntary and amicable settlement of debts by bringing together agriculturist debtors and their creditors through the medium of Debt Conciliation Boards. The Boards failed to achieve anything substantial by way of affording relief to the indebted ryots, and were abolished in 1942.

(*e*) *The Madras Agriculturists' Relief Act*, 1938.—With the passing of this Act, compulsory scaling down of debts in accordance with the provisions of the Act was undertaken. In the course of six years from 1938 to 1944 a sum of 9·17 crores involved in applications made under the Act was scaled down to 4·36 crores. This excludes the reduction of debt secured by voluntary settlement of the parties without going to the court. The proposal to amend the Act has been deferred for the duration of the war.

Recently *the Madras Pawn-Brokers Act* has been passed requiring pawn-brokers to take out licences, restricting the rates of interest for loans and providing safeguards against fraudulent transactions.

(vii) *North-West Frontier Province.*—The money-lender in most cases is the *bania*. He is the most important and frequent source of financing agriculture. The normal system is that the *bania* advances the money required by the agriculturist to purchase those necessities of life not derived directly from agriculture, such as cloth, sugar, condiments, tea, cooking and other utensils, etc. In addition, the *bania* finds the money required for such occasions as marriages, births, deaths, etc. In payment of debt and interest the *bania* takes the crop from the threshing floor when prices are lowest. He sells later in the year when prices appreciate. In consequence the debt of the village tenant and small landlord is ever increasing. Due to the ability of the *bania* to hold on to stocks until prices rise he is in fact always the gainer. The result is that few agriculturists are free of large sums of unprofitable debt and are never sufficiently debt free to be able to embark on improvements to their lands. These remarks apply particularly to Kohat, Bannu and Dera Ismail Khan districts.

The principal restriction on the operations of money-lenders in this province is the Punjab Land Alienation Act. The Act has been effective in Peshawar, Mardan and Hazara districts. In Kohat, Bannu and Dera Ismail Khan districts, this has not proved effective. It is evaded by what are known as *benami* transactions, i.e., the debt is secured in the name of an agriculturist who is under agreement with the *bania* to ensure that the money he lends is secured.

(viii) *Orissa.*—The most important financing agency is the village mahajan who gives loans not only in cash but also in kind. Although the interest charged by these mahajans is very high, yet they play a very useful part in the rural economy of the province. Not only can the poor agriculturist get loan from the mahajan at the right time and in adequate quantity, the latter is sometimes considered by the poor villagers to be a real prop in times of difficulty. But for usury, there is much to commend in this institution.

The Orissa Money-lenders Act, 1939, places restrictions on the operation of money-lenders to protect the interests of all classes of borrowers. The Act has very serious drawbacks and has not, therefore, given the expected degree of protection because the onus to prove that the creditor carries on the business of money-lending and that the loan was advanced in the course of that business is on the debtor, who is often unable to discharge the onus. Supply of goods on *khata* account, or on credit, is not treated as a loan for the purpose of the Act. The creditor often keeps back out of the loan an amount sufficient to cover the difference between the legally recoverable rate of interest and the usurious rate which he wants to charge. Alternatively, the amount noted in the bond, or promissory note, is higher than the amount actually advanced.

(ix) *Punjab.*—The oldest and most important agency for financing agricultural operations has been the village money-lender until recently. He provided finance on a fairly large scale and through him the agriculturist generally marketed his produce. His terms for providing these facilities were exhorbitant and were open to much abuse and consequently resulted in heavy rural indebtedness. In view of recent legislation it can be said that the village money-lender is no longer as important as he used to be 15 years ago, but he is still an important agency for financing agricultural operations. The present village money-lender is not necessarily the same person belonging to the non-cultivating class as he used to be some 40 years ago. From the advent of canals, service under Government, labour and trade in foreign countries and practice of thrift, there has emerged a new type of village money-lender who belongs to the cultivating class and has more hunger for land than the old type of money-lender who generally accepted mortgage or sale of land when he despaired of payment of interest as well as principal.

The Punjab Alienation of Land Act, 1901, provided for the restriction of the transfer of land from the agriculturist to the non-agriculturist tribes except with the sanction of the Deputy Commissioner. The Act was effective in preventing the sale of land by the agriculturist to the non-agriculturist tribe as such. In actual operation, however, the money-lender, not willing to lose his hold on the cultivator resorted to *benami* transactions. To put a stop to this practice, *the Punjab Alienation of Land (Second Amendment) Act* was passed in 1938 whereby the alienor was to become entitled to the possession of the land, even if he himself was a party to evade the provisions of the Punjab Alienation of Land Act. The Act was declared ultra vires both by the High Court and the Federal Court. The Punjab Alienation of Land Act, 1901, has helped the growth of the agriculturist money-lender who is probably a greater menace to the peasant proprietor than the non-agriculturist money-lender. Hence, *the Punjab Alienation of Land (Third Amendment) Act,* 1938, was passed which included the agriculturist money-lender to a certain extent in the same category as the non-agriculturist money-lender.

Other enactments which refer to money-lending are as follows:—*The Usurious Loans Act,* 1918, gave powers to the courts to regulate the rate of interest but it practically remained a dead letter. *The Punjab Regulation of Accounts Act,* 1930, seeks to regulate the money-lender's business. It provides for using regular account books and maintenance of separate accounts of money-lending business and shop-keeping business. These provisions were mostly ignored and evaded until the enactment of the *Money-lenders Registration Act,* 1938, which provides severe penalties for their non-observance. *The Punjab Relief of Indebtedness Act* was passed in 1934 in order to limit the rates of interest and provide for establishment of Debt Conciliation Boards. The Act also incorporates the principle of *damdupat.* Courts cannot grant a decree for a larger sum than twice the amount taken as principal. By the end of 1943 claims amounting to 3·61 crores were scaled down to 1·38 crores by agreement. *The Punjab Debtors Protection Act of* 1936 aims at the more effective protection of the debtor. It exempts from attachment for sale, standing trees and standing

crops other than cotton and sugarcane. It also exempts ancestral property from liability except in case the debt has been incurred against mortgage of such property. It reduces the period of the execution of a decree from 12 to 6 years. The Punjab Registration of Money-lenders Act of 1938 aims at regulating the business of the money-lender on the lines of the British Money-lenders Act, 1937. Money-lenders are required to register themselves at the office of the Collector of the district, and take out a licence which is renewable periodically. Licences are liable to be cancelled if the licensee is found guilty of dishonesty and fraudulent practice in his business; or is found by a court to have charged higher rates of interest than those prescribed under the Relief of Indebtedness Act, in more than one suit; or has been held by a court to have contravened the provisions of section 3 of the Punjab Regulation of Accounts Act, in more than two suits. If a money-lender is not registered and does not hold a valid licence, any suit instituted by him for the recovery of a loan or the execution of a decree relating to a loan shall be dismissed. The Provincial Government has been given power to exempt any person or class of persons from the operation of the Act. This Act does not affect the loans granted by a landlord to his tenant for the purposes of husbandry and also those granted by Banks, Co-operative Credit Societies or the Central and Provincial Governments. *The Punjab Restitution of Mortgaged Lands Act*, 1938, applies to any subsisting mortgages of land which were effected prior to 8th June 1901.

Concluding, the Provincial Government state: "The general tendency of recent legislation relating to indebtedness has been to strike at the facilities to borrow and it is believed that coupled with the conditions arising out of the war this legislation has gone a long way in relieving the distress of the debtors. The peace-time problem to undermine the root cause of indebtedness—the necessity to borrow—still remains unsolved." The hope has been expressed that "post-war planning will give a death blow to the root cause of indebtedness."

(x) *Sind.*—The village *bania* rivals the zamindar as the predominating agency for financing agricultural operations. Linked with the *bania* is the ginning factory owner wherever cotton is grown. A *bania* customarily owns a supply store-shop in the village, and his functions are mainly to meet the requirements of the villagers for consumer goods which is often done on credit and to advance money at the commencement of the season to the cultivators (crop-sharers) on behalf of the landowner; the amount advanced together with high rate of interest is recovered from the cultivator's 50 per cent share of the crops he harvests. More progressive zamindars make advances direct to the cultivators and charge a reasonable rate of interest. The village *bania* serves a useful purpose, but he must be considered to be nothing more than a necessary evil until he can be supplanted by a more efficacious system of financing agriculturists.

Restrictions have been placed on the operation of the money-lender by the Deccan Agriculturists' Relief Act and the Sind Agriculturists' Relief Act, 1940, which have now been reinforced by the Money-lenders Act of 1944. The first two Acts have on the whole produced good results, but it is too early to assess the working of the third. The main provisions of the Money-lenders Act require money-lenders to take out licences and maintain regular accounts and also provide for the limitation of the rate of interest.

(xi) *United Provinces.*—By far the most important agency in the matter of supply of rural credit is the village mahajan. A new type of rural credit supplier has emerged as a consequence of the Land Alienation Act and other restrictions have been placed upon the village mahajan by recent credit control legislation. This new type consists in the zamindar or in the cultivator class of credit supplier. Linked with them is the chain of various grades of middlemen—*beoparis* or *arhatias*, who give ready cash either for standing crops or crops otherwise contracted for. The worst feature of indigenous money-lending is the exorbitant rate of interest which ranges from 25 per cent to 100 per cent. From an analysis of their circumstances, it is clear that the village money-lenders are an indispensable element in the financial system of the country, though their resources are limited and methods antiquated. The true remedy, therefore, is not to end but to mend them. No statistical data are available regarding their business. The need for such data is urgent, particularly with a view to determine the direction in which their business should be improved. It is, therefore, considered that it would be useful to proceed with the implementation of the United Provinces Money-lenders Bill, 1939.

It is high time that the Reserve Bank of India, through its Agricultural Credit Department, became linked with the indigenous banking system of the province. It does not seem desirable that the bank should insist on differentiation of the banking transactions of these village sahukars from their trading transactions. It will not be possible to introduce this bifurcation among rural credit suppliers.

D.—The Trend of Agricultural Indebtedness and Savings

Question

(i) Has an estimate been made of the agricultural indebtedness in your province before the war?

(ii) Can you assess to what extent, if any, this has been reduced as a result of rise in prices of agricultural products during recent years?

(iii) Have saving habits been developed?

Abstract of replies[1].

1. *Assam.*—(i) Roughly 22 crores.

(ii) Reduced roughly by one half. Some estimate that it has been liquidated altogether.

(iii) Saving habits have not developed appreciably. There is a good case for continuing the small savings scheme in normal times.

One officer says that inflation has rather developed the spending habit and not the saving habit. Another thinks there is a certain amount of saving mainly of a hole-in-the-ground type. He bases his opinion on the continual disappearance of small coin. A non-official gentleman thinks that saving habits have been developed to a certain extent.

2. *Bihar.*—(i) Roughly 148 crores.

(ii) No data are available. It is generally believed that indebtedness has been reduced to some extent. Two officers as well as a non-official gentleman believe that a large part of the debt has been wiped out by the rise in prices of agricultural products.

(iii) There has been no noticeable development of the saving habit. The Government view is that there is little to save and invest after meeting the increased cost of cultivation and cost of living and paying debts.

3. *Bengal.*—(i) Roughly 97 crores.

(ii) Substantial reduction has been possible because a large number of cultivators are now in a better position than before to repay their debts in cash and to secure thereby larger reductions of their debts from the creditors. It is difficult to say to what extent the small cultivators who form the majority of the agricultural debtors, have reacted to the rise in prices, since the crop they get from their lands is not always sufficient for the upkeep of their families and they have to purchase cloth, salt, kerosene, medicine, etc., which are selling at abnormal prices.

(iii) It is difficult to say if the agriculturists are saving anything beyond what is necessary to repay debts.

4. *Bombay.*—(i) Roughly 58 crores.

(ii) Agriculturists are able to pay part of their debts and the outstandings and overdues of co-operative societies are also going down. While it is true that agricultural wages and prices of consumer goods have increased and the prices of foodgrains have been controlled, there is decided improvement in the condition of the agricultural classes.

(iii) Well-to-do agriculturists are, to some extent, taking advantage of the facilities for encouraging the savings habit afforded by the Post Office Savings Bank, Cash Certificates, National Savings Certificates and Co-operative Societies. Others have practically nothing to lay by.

5. *The Central Provinces and Berar.*—(i) Roughly 36 crores.

(ii) High prices have resulted in regular payments of instalments of scaled-down debts and in making many debt-free or in redeeming their lands which were mortgaged.

[1] The replies to the first part of the question are generally based on estimates made about ten years ago, and should not be regarded as accurate even at that time. They serve merely to give a rough idea of the order of magnitude of the debt.

(iii) The rural population knows no other method of saving than the purchase of land, cattle, or gold and silver. All these being high priced, a leaning has been shown to purchase land wherever possible.

6. *Madras.*—(i) Roughly 200 crores.

(ii) An enquiry by a competent economist is proposed to be undertaken as regards the present position of indebtedness. There is a pronounced fall in the business of the land mortgage banks. Outstanding loans are decreasing and overdues are reduced. There is a progressive increase in the collections, and advance collections have also been increasing year by year. It is possible, from these indications, to conclude that ryots have taken advantage of the present level of prices to discharge as much of their prior debt as possible with the increased incomes or by disposing of a portion of their holdings, which have risen in value, or by both.

(iii) A savings drive which was launched in June 1943 resulted in the subscription of 22 crores by the end of March 1944. The drive is being continued, and during the first five months of 1944–45 yielded 5·40 crores. Various measures are being taken to encourage the saving habit and to secure investment in land improvements.

A non-official view is as follows: "It is safe to assume that there has been a reduction in indebtedness. At least saving to clear their dues instead of frittering away their resources seems to exist, thereby disproving that the agriculturist is improvident. The saving habit should be encouraged by diverting the funds for investment in productive enterprises."

7. *North-West Frontier Province.*—(i) No estimate has been made.

(ii) The village proprietary body has been able during the present period of high prices to become debt-free. The debt of the tenant class in Kohat, Bannu and Dehra Ismail Khan districts seems to be little affected. This class is unlikely ever to free itself from debt due to the terms and conditions of the original debt incurred.

(iii) There has been no indication of any development of saving habits or thrift during the war. On the contrary, the tendency has been to spend freely, and mostly not on agricultural objects.

8. *Orissa.*—(i) No reliable estimate has been made.

(ii) Substantial cultivators have been able to effect small savings, out of which they paid something to liquidate their own debts without incurring new ones. The smaller agriculturists owning land only to the extent of 5 acres have not much benefited by high prices, as they have hardly any surplus produce to repay the old loans and the high prices of consumer goods have imposed an additional strain on this class. The indebtedness of members of co-operative societies in the province has dropped from about 52 lakhs to 42 lakhs, although the total number of members has increased by about 20 per cent.

(iii) The well-to-do classes are investing their savings in the purchase of lands and Defence Savings Certificates and other war bonds. There has been a noticeable demand for land among agriculturists in the rural areas.

9. *Punjab.*—(i) About 140 crores (200 crores have been sometimes mentioned).

(ii) There is no doubt that agricultural indebtedness has been greatly reduced during recent years. The amounts claimed before Debt Conciliation Boards have been steadily decreasing since 1941, which means that either the amount of debt has decreased or that the debtors and creditors have settled their debts without the help of these Boards, or both. In several districts the work of these Boards has decreased so much that it is no longer necessary to keep them in being. Where holdings are large and facilities for irrigation sufficient, great benefit has been derived from the rise in prices. In other areas the saleable surplus has been largely consumed by the rise in prices of other consumable goods required by cultivators. Crown lands worth 16 crores have been sold during the six years commencing from 1939–40, and during this period 26·07 crores have been invested in Defence Bonds, Defence Savings Certificates, Defence Savings Bank Deposits, Defence Savings Provident Fund, etc. About a crore of rupees every month is being received by way of family allotments of soldiers and, notwithstanding the increase in the cost of living as well as the cost of production which must have to some extent neutralized the

rise in prices of agricultural produce, it can be safely assumed that a substantial portion of this amount must have been used in the settlement of debts. This inference is supported by the figures relating to recoveries and outstanding debts of co-operative credit societies in the province.

(iii) There is no doubt much avoidable spending, but the application of controls, non-availability of consumer goods, and lack of means of transport have acted as a brake, and the memory of the fall in prices in 1930 and following years has also discouraged spendthrift tendencies. Much of the surplus cash derived from the sale of agricultural products has been and is being used for purchase of more Government land or is being put into defence and small saving bonds.

10. *Sind.*—(i) No estimate has been made.

(ii) There is no doubt that private debts have been largely repaid, and very large arrears of taccavi and land revenue which were long outstanding have been collected. No precise estimate can be made of the extent to which indebtedness has been cleared.

(iii) It is very doubtful whether any saving habits have been developed. The Hindus of the province, taking them by and large, are careful with money, but the Muslim agricultural population is not. They are prone to fritter their spare money away on social functions and wasteful amusements. The shortage of consumer goods has handicapped them in doing this but they seem able to get rid of their money in one way or another without much difficulty.

11. *United Provinces.*—(i) Roughly 124 crores.

(ii) No definite information is available, but the increased prosperity of the agriculturist classes must have tended to reduce their annual borrowings and also perhaps the total volume of the debt.

(iii) No precise information is available to establish that saving habits have been developed. It is possible to say that agriculturists have been able to save more than previously. The Defence Savings drive resulted in collections amounting to nearly 12 crores between May 1943 and March 1944. A fairly large proportion of this amount represents investments by the rural public in Post Office Savings Bank accounts and in collective subscriptions.

APPENDIX IV

AGRICULTURAL PRICES AND WAGES

A.—Review of prices of rice and wheat.

B.—Regulation of foodgrains prices.

C.—Agricultural wages.

APPENDIX IV

AGRICULTURAL PRICES AND WAGES

A.—Review of prices of rice and wheat

1. *Object of note.*—The object of this note is to review the course of the prices of rice and wheat in different provinces of British India before and during the present war, and to determine the broad relation between the prices prevailing in India during the year 1944 and pre-war prices as well as pre-depression prices. For the purposes of this note, it is assumed in relation to any particular price category, that the average during the quinquennium ending 1938–39 represents the pre-war price; and that the average during the quinquennium ending 1928–29 represents the pre-depression price.

2. *Statistics reviewed.*—The Season and Crop Reports prepared annually by Provincial Governments include figures showing for each district the average prices during the harvest period for the principal foodgrains of the province. The median average of the district figures thus prepared is ascertained and included in a statement of harvest prices published in the Agricultural Statistics of India. The harvest prices so recorded have been extracted in Statements I and II annexed. They cover the period 1913–14 to 1942–43 and furnish rice prices for nine provinces, paddy prices for two provinces and wheat prices for eight provinces.* The averages of the figures for the quinquennia ending 1928–29 and 1938–39 have been calculated and are exhibited in Statements III and IV, together with index numbers based on pre-depression and pre-war prices.

3. *Pre-war prices in the principal producing provinces.*—Bengal and Madras are the two most important rice-producing provinces; the Punjab and the United Provinces, the two most important wheat producing provinces. The following table shows the average harvest prices per maund of rice and wheat during five quinquennial periods before the present war as well as the highest and the lowest prices during the 25-year period:—

	Rice.		Wheat.	
	Bengal.	Madras.	Punjab.	United Provinces.
	RS. A.	RS. A.	RS. A.	RS. A.
1914–15 to 1918–19 ..	4 13	5 9	3 15	4 8
1919–20 to 1923–24 ..	6 1	7 7	4 14	5 5
1924–25 to 1928–29 ..	6 15	7 4	4 9	5 6
1929–30 to 1933–34 ..	3 13	4 7	2 5	2 14
1934–35 to 1938–39 ..	3 6	3 13	2 5	3 0
Highest price in 25 years ..	7 8	8 14	6 11	6 6
Lowest price of 25 years ..	2 10	3 2	1 9	2 5

4. *Movement of rice prices measured by the pre-depression price standard.*—Assuming the average price of the five-year period ending 1928–29 is represented by 100, prices during other quinquennia can be expressed as percentages of the pre-depression prices. The table below furnishes the index numbers thus obtained for rice in Bengal and Madras and also exhibits the position in seven other provinces taken together:—

Index numbers of rice prices.

	Bengal.	Madras.	Seven other provinces.
1914–15 to 1918–19	69	77	77
1919–20 to 1923–24	87	103	100
1924–25 to 1928–29	100	100	100
1929–30 to 1933–34	55	62	60
1934–35 to 1938–39	49	52	53
Highest price in 25 years ..	108	122	121
Lowest price in 25 years ..	38	43	45

*There are a few omissions in the Statements. It is ascertainable from the published material that the prices represent the average retail prices during the harvest period in the case of certain provinces. Whether this has been uniform in the case of all provinces has not been verified. It may be assumed that the figures have been compiled on a uniform basis throughout the period in each province and are reliable for the purpose of indicating the long-term trend.

The figures in this table bring out the fact that throughout India prices during the decade following the end of the last war, were higher than during that war. In the case of Bengal the rise of prices immediately after the war was less marked but gathered momentum during the quinquennium preceding the depression. This was also the case in Assam and Bihar. In Madras the peak was reached in 1919–20 and a drop occurred in the following year. The further course of prices was relatively steady. This was roughly also the case in other provinces.

When the depression occurred, the fall of prices was more pronounced in Bengal than elsewhere and recovery was also slower. The average figures for the quinquennium ending 1933–34 do not adequately reflect the magnitude of the depression because they include the prices of 1929–30, when prices had begun to fall but not steeply. The "lowest price" figures indicate more clearly the magnitude of the price fall. It will be noticed that the pre-war price, i.e., the average of the quinquennium ending 1938–39, is smaller than the average of the preceding quinquennium, still smaller than during the last war, and generally of the order of one-half of the pre-depression price level. This indicates clearly the extreme slowness of the rate of recovery and that when war broke out in 1939, the greater part of the recovery from the depression was still to come.

5. *Movement of wheat prices measured by the pre-depression standard.*—The following table shows in respect of wheat, figures corresponding to those given above for rice:—

Index numbers of wheat prices.

	Punjab.	United Provinces.	Six other provinces.
1914–15 to 1918–19	87	84	83
1919–20 to 1923–24	108	99	104
1924–25 to 1928–29	100	100	100
1929–30 to 1933–34	50	53	58
1934–35 to 1938–39	50	55	54
Highest price in 25 years ..	147	119	139
Lowest price in 25 years ..	34	43	46

These figures reflect the same tendencies as in the case of rice. It will be noted, however, that the rise in price between the last world war and the decade following it, was proportionately less in the case of wheat than in the case of rice.

6. *Movement of prices during the war before the fall of Burma.*—For the purposes of measuring the price changes in recent years it is convenient to use the pre-war price, i.e., the average price during the five years ending 1938–39, as the standard. This average is accordingly assumed to be 100 and the following table exhibits for rice and wheat the index numbers for the years 1939–40, 1940–41 and 1941–42. For purposes of comparison the pre-depression level and the lowest price level have also been represented by index numbers:—

	Rice.			Wheat.		
	Bengal.	Madras.	Seven other provinces.	Punjab.	United Provinces.	Six other provinces.
Pre-depression level	206	190	192	197	179	186
Lowest price level	78	82	86	68	77	85
Pre-war period	100	100	100	100	100	100
1939–40	131	113	116	113	127	115
1940–41	152	125	137	132	117	130
1941–42	159	141	170	216	177	174

It is clear that during the first year of the war, rice and wheat prices were still a long way behind pre-depression levels. During 1940–41 a steady rise in prices was maintained. But it is noticeable that rice prices in Bengal and wheat prices in the Punjab were rising more rapidly than elsewhere. The former reflected in the main the effect of an extraordinarily poor crop. The further advance which took place in 1941–42 brought wheat prices in the Punjab definitely above the pre-depression level, in the United Provinces practically to that level, and elsewhere not far behind. Rice prices were still roughly 50 points below the pre-depression level in Bengal and Madras, but in the other provinces they had risen to 22 points below that level.

7. *Rice prices in recent years.*—Information about the provincial harvest prices is incomplete for the year 1943 and not yet available for 1944. It is, therefore, necessary to piece together information obtained from Provincial Governments in reply to enquiries on this point, in order to obtain some idea of the relation between the price level, (*a*) in different provinces and (*b*) in each province as compared with pre-war prices.

(i) *Madras.*—Index numbers showing the presidency average of the retail prices of rice (second sort), based on 1913–14 as 100, are maintained by the Provincial Government. By converting the indices for the five years ending 1938–39 to 100, it is possible to establish the relationship between the recent price level in Madras and pre-war prices. The relevant figures are shown below:—

Year.	Index based on 1913–14.	Index as converted to quinquennium ending 1938–39 as base.
1934–35 ..	71·30	
1935–36 ..	73·92	
1936–37 ..	71·11	100
1937–38 ..	73·36	
1938–39 ..	73·73	
1939–40 ..	79·55	109
1940–41 ..	90·62	125
1941–42 ..	103·94	143
1942–43 ..	154·41	212
1943–44 ..	184·24	253

It may be assumed from the above figures that the level reached in 1943–44 was roughly 250 per cent of the pre-war price.

So much about retail prices. A statement furnished by the Madras Government shows the monthly average wholesale prices expressed in index numbers, based on the prices which prevailed in August 1939 as 100. These numbers, averaged for the whole year, are shown below:—

Years.	Average monthly indices.
1940–41	120
1941–42	139
1942–43	192
1943–44	246
1944–45 (5 months only) ..	240

In view of the fact that the monthly average wholesale price for August 1939 is given as Rs. 3–11–0 per maund, while the pre-war average retail price was Rs. 3–13–0 per maund, it may be taken that in respect of wholesale prices, the index numbers furnished above express fairly closely the relation between prices in these years and pre-war prices.

During the first eight months of 1944 the average monthly wholesale price of rice (second sort) in the province as a whole was Rs. 8–14–0 per maund. This, it may be inferred, represents something between 240 and 250 per cent of the corresponding pre-war price.

(ii) *Bengal.*—Prices rose enormously in 1943. They came down, however, in 1944 and the provincial average price of coarse rice during the first 10 months of 1944 was Rs. 14–5–0 per maund as compared to the pre-war average of Rs. 3–6–0 per maund. But it was a period of steadily descending prices and in October 1944 the average price was Rs. 11–13–0 per maund representing about 350 per cent of the pre-war figure. There is no information about subsequent months; but in view of the crop being slightly below normal and some information about prices in the first week of April 1945, it seems unlikely that the average has fallen further;

It may, therefore, be concluded that there is at present a considerable disparity in prices between the two big producing provinces. While the latest prices in Madras are somewhat below 250 per cent of the pre-war price, Bengal prices are in the neighbourhood of 350 per cent of the pre-war figure.

(iii) *Sind.*—The pre-war price was As. 8 per maund above Madras. The wholesale price in the producing areas in this province is being kept, in terms of a Direction issued by the Government of India, in the neighbourhood of Rs. 9–4–0 per maund. Sind rice prices may, therefore, be regarded as being nearly in parity with Madras and not more than 250 per cent of pre-war prices.

(iv) *The Central Provinces.*—The pre-war price was As. 9 per maund below Madras. The average wholesale price per maund during the first nine months of 1944 was Rs. 8–13–2 at Raipur, Rs. 9–2–8 at Gondia, Rs. 9–15–8 at Nagpur, and Rs. 11–1–9 at Jubbulpore. From this it may be inferred that the minimum price in the Central Provinces roughly corresponds to the average price in Madras and that the average price in the Central Provinces is intermediate between Bengal and Madras and is probably of the order of 300 per cent of pre-war.

(v) *Orissa.*—The pre-war price in this province was As. 15 per maund below Bengal and Re. 1–6–0 per maund below Madras. Under the system of monopoly procurement in force in the province, there is a fixed wholesale price of Rs. 9 per maund for coarse rice. It is only a little higher than the average wholesale price in Madras. Thus the proportionate increase as compared with the pre-war price is roughly of the same order as that of Bengal, though the actual price level is lower than in Bengal and approximates to that in Madras.

(vi) *Bihar.*—The pre-war average prices in Bihar and Bengal were about equal. Early in 1944, prices in Bihar were lower than in Bengal, but towards the end of the year they tended to equality.

(vii) *Assam.*—The available figures (which are incomplete) indicate that during 1944 prices in Assam were roughly in parity with Bengal prices.

(viii) *Bombay.*—A marked feature of the price situation in this province is the wide variation of district prices. In September 1944 prices varied from Rs. 11–10–8 in the principal rice-producing districts of Thana and Colaba, to Rs. 15–13–4 in Surat, and Rs. 17–8–0 in Ahmedabad. The pre-war price for the province as a whole was 13 annas per maund above Madras; but under present control conditions, an average price has no meaning for the province. The position broadly appears to be that prices in the producing areas are probably at a level intermediate between Madras and Bengal, while the prices in consuming areas are probably higher than even the present Bengal level.

(ix) *The United Provinces.*—The pre-war price was As. 5 per maund above Madras, and As. 12 above Bengal. The average price during the first nine months of 1944 was Rs. 14–11–0 per maund. Taking the pre-war parity into account, prices may be regarded as being roughly of the same order as in Bengal.

(x) *Punjab.*—Figures furnished by the Provincial Government indicate that the average wholesale price of rice at Amritsar was Rs. 3–11–3 per maund during the quinquennium ending 1939, rose to Rs. 15–7–8 per maund during 1943 and fell during the first nine months of 1944 to Rs. 13–3–0 per maund. There was a big drop in price from Rs. 13–8–0 in August to Rs. 10–8–0 in September, i.e., from a level exceeding 350 per cent to below 300 per cent of the pre-war level. The subsequent course of prices is not known but may be assumed to be well above the Madras and Sind parity, though not quite so high as in Bengal.

To sum up, the position broadly appears to be that in relation to pre-war prices, prices of rice in Madras are the lowest in India and those in Sind are very nearly as low. The level may be taken to be not less than 240 per cent and not more than 250 per cent of the pre-war price. The prices prevailing in Bengal are definitely high and are in the neighbourhood of 350 per cent of the pre-war price. The prices in Assam, Bihar and the United Provinces are approximately at the same level as in Bengal. The prices in the Central Provinces are intermediate between Bengal and Madras prices and roughly about 300 per cent of the pre-war level. Prices in the Punjab are intermediate between those in the Central

Provinces and Bengal. Orissa prices are not much higher than Madras, though in view of the relatively low level of prices before the war, the proportionate increase has been higher.

8. *Wheat prices in recent years*—(i) *The Punjab.*—The following table shows the average wholesale prices for wheat at Lyallpur and the index numbers based on the quinquennium ending 1938–39:—

	RS.	A.	P.	
Quinquennium ending—				
1938–39	2	8	9	100
1940	3	0	8	119
1941	3	10	11	145
1942	4	11	9	186
1943	10	2	9	399
First nine months of—				
1944	9	1	9	357

The Government of India have fixed the statutory maximum price for wheat at Rs. 9–8–0 per maund and prices are kept below the statutory maximum through control measures. In September 1944, the price was as low as Rs. 7–14–0 per maund. Reports relating to the first week of April 1945, however, indicate a return to prices near the statutory maximum. There is thus a tendency to marked fluctuation. Judging from the figures for the most important centres, the level maintained in the province generally during the first nine months of 1944 was probably in the neighbourhood of 350 per cent of the pre-war price.

(ii) *The United Provinces.*—The pre-war average price was Re. 0–11–0 above the Punjab level, and the statutory maximum provides for a price differential of Re. 0–12–0 per maund above that in the Punjab. The maintenance of the statutory maximum has presented difficulties in the United Provinces. The average price during April to September 1944 was Rs. 10–0–8 per maund. Thus the price in the United Provinces may be regarded as tending to be relatively as high as in the Punjab, if not higher.

(iii) *Sind.*—The pre-war average price was about As. 12 per maund above the Punjab level. The Government of Sind succeeded in keeping prices steady between the beginning of 1942 and April 1944. In view of the very large disparity between the prices prevailing in the Punjab and Sind, wheat prices were permitted to rise in Sind and the same statutory maximum prices were fixed for both provinces. Prices then fluctuated, and the average figure for 1944 is not available. The figures available for the first week of April 1945 indicate a level about As. 12 per maund below the Punjab level. While the position is somewhat unsettled, it is clear that prices in Sind are definitely lower than in the Punjab and may be regarded as between 250 and 300 per cent of the pre-war prices.

(iv) *The Central Provinces.*—The pre-war price was the same as in Sind. The average wholesale price for the first nine months of 1944, as compared with the 1938 average (which is very near the pre-war average), was 350 per cent in Seoni where the percentage rise was the lowest. The average prices were higher elsewhere ranging from Rs. 10–14–3 at Seoni and Rs. 10–12–5 at Khurai, to Rs. 13–6–0 at Saugar, Rs. 13–6–8 at Nagpur and Rs. 13–9–0 at Jubbulpore. Prices at these latter centres, however, dropped during September 1944 and this brought the prices roughly into parity with those at other centres. Broadly, therefore, wheat prices in the Central Provinces may be regarded as tending to be as high as in the Punjab and the United Provinces, i.e., at or above 350 per cent of the pre-war level.

(v) *Bombay.*—Prices ruled high in early 1944, and varied widely from district to district. They came down later, and a statement furnished by the Bombay Government indicates that in September 1944 a level was reached which was generally comparable with that in the Central Provinces.

To sum up, wheat prices have been generally unsettled and have tended to be about 350 per cent of the pre-war prices or higher; an exception is Sind, where prices tended to range from 250 per cent to 300 per cent of the pre-war figures.

STATEMENT I.—*Harvest prices of rice (winter) per standard maund.*

Median averages of the district figures reported in the Provincial Season and Crop Reports).

Year.	Assam.	Bengal.	Bihar.	Bombay.	Central Provinces and Berar.	Madras.	North-West Frontier Province. *	Orissa.	Punjab. *	Sind.	United Provinces.
	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.	RS. A.
1913–14 ..	4 15	5 2	4 8	5 8	4 11	5 8	2 11	3 13	2 8	6 1	5 11
1914–15 ..	5 1	5 2	4 10	5 8	4 9	4 14	2 14	3 13	2 11	6 8	5 0
1915–16 ..	5 2	5 4	4 12	5 11	4 6	4 15	3 1	3 12	2 14	5 15	5 11
1916–17 ..	4 9	5 0	4 0	5 13	4 7	5 3	2 12	3 8	2 7	6 3	5 0
1917–18 ..	..	3 8	3 7	5 11	5 0	5 1	2 4	2 12	2 10	7 1	4 10
1918–19 ..	..	5 4	6 0	8 14	..	7 11	3 8	5 1	4 2	10 11	7 6
1919–20 ..	6 5	7 0	6 10	7 14	8 1	8 14	5 6	5 10	4 6	10 8	8 0
1920–21 ..	5 10	6 8	6 3	8 14	7 0	7 8	4 12	5 4	4 9	12 5	9 9
1921–22 ..	5 5	6 0	5 15	9 2	6 6	7 4	6 10	4 8	5 0	12 5	8 14
1922–23 ..	4 5	5 8	5 0	8 0	5 3	7 0	3 8	3 8	3 5	10 5	7 10
1923–24 ..	4 13	5 4	5 2	8 0	5 12	6 12	3 4	3 5	3 0	6 12	6 14
1924–25 ..	6 4	6 7	5 6	8 3	6 9	7 11	3 4	4 6	3 8	8 3	7 9
1925–26 ..	6 6	7 0	5 12	8 7	5 9	7 2	3 9	4 10	3 12	8 0	7 4
1926–27 ..	6 9	7 3	6 5	8 3	6 6	7 5	3 5	4 10	3 10	11 4	7 4
1927–28 ..	7 1	7 8	6 14	8 0	5 14	7 4	3 4	4 3	3 8	11 4	7 2
1928–29 ..	5 12	6 10	6 8	7 13	6 6	6 14	3 4	4 6	3 15	10 2	7 6
1929–30 ..	5 0	6 0	5 8	7 10	5 9	6 6	3 5	3 8	3 3	9 11	7 0
1930–31 ..	3 13	4 1	3 14	5 14	3 7	4 14	2 8	2 6	1 10	6 2	5 2
1931–32 ..	2 15	3 5	3 5	4 12	3 4	4 3	2 11	1 15	1 10	5 14	4 0
1932–33 ..	2 6	2 10	3 3	4 13	3 1	3 10	2 4	1 13	2 2	5 6	4 7
1933–34 ..	2 11	3 0	3 1	4 5	2 13	3 2	2 2	1 11	1 10	4 10	3 11
1934–35 ..	3 1	3 4	3 6	4 4	3 3	3 11	1 13	2 3	1 10	4 2	3 12
1935–36 ..	2 15	3 8	3 8	4 7	3 3	3 13	2 0	2 10	1 15	4 10	4 1
1936–37 ..	2 13	3 6	3 5	4 12	3 5	3 11	2 1	2 7	2 1	4 0	4 3
1937–38 ..	3 0	3 4	3 4	4 12	3 4	3 14	1 13	2 8	2 0	4 14	4 5
1938–39 ..	3 3	3 8	3 8	5 0	3 4	3 15	1 12	2 10	1 15	4 0	4 3
1939–40 ..	4 0	4 7	4 0	5 3	3 11	4 5	2 0	3 1	2 5	4 5	4 7
1940–41 ..	4 8	5 2	4 12	5 11	4 13	4 12	2 5	3 10	2 8	5 0	5 5
1941–42 ..	4 12	5 6	5 7	8 0	6 6	5 6	3 0	4 3	3 9	..	6 11
1942–43 ..	8 14	..	8 0	12 12	..	8 6	6 11	6 3	5 15	..	10 0

* Relates to paddy.

STATEMENT II.—*Harvest prices of wheat per standard maund.*

(Median averages of the district figures reported in the Provincial Season and Crop Reports.)

Year.	Bengal.	Bihar.	Bombay.	Central Provinces and Berar.	North-West Frontier Province.	Punjab.	Sind.	United Provinces.
	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.
1913–14	4 4	4 1	4 11	8 15	3 7	3 1	3 14	3 15
1914–15	5 2	5 3	5 8	4 4	3 10	3 8	5 2	4 6
1915–16	5 0	5 0	5 2	3 5	3 11	3 3	4 8	3 11
1916–17	4 8	4 5	4 13	3 11	3 9	3 8	4 10	3 13
1917–18	3 10	4 10	6 5	5 8	4 4	3 14	5 12	4 3
1918–19	6 0	6 9	10 8	..	5 0	5 8	8 3	6 6
1919–20	7 8	6 15	8 14	6 5	4 15	4 12	6 11	5 5
1920–21	5 12	6 3	8 3	7 4	7 10	6 11	6 11	6 3
1921–22	7 0	7 7	9 2	7 4	5 4	5 8	9 14	6 6
1922–23	5 4	5 13	6 14	4 6	3 6	3 12	5 0	4 9
1923–24	4 13	5 2	6 11	4 2	3 9	3 10	4 12	4 0
1924–25	6 0	6 6	8 2	5 9	5 6	5 0	6 12	5 11
1925–26	6 1	6 6	7 15	4 14	4 12	4 14	6 11	5 8
1926–27	6 4	6 5	8 0	5 10	4 7	4 8	6 2	5 3
1927–28	6 2	6 0	6 7	5 3	4 4	4 4	5 13	5 2
1928–29	6 0	6 0	7 2	5 7	4 13	4 4	7 3	5 5
1929–30	5 14	5 0	6 7	4 7	3 10	3 0	4 14	3 14
1930–31	4 0	3 9	4 7	2 4	2 5	1 9	2 13	2 5
1931–32	3 8	3 8	4 0	2 8	2 3	2 1	2 14	2 9
1932–33	3 2	3 8	4 4	2 14	2 14	2 12	3 8	2 15
1933–34	3 0	3 3	3 15	2 9	2 6	2 2	2 8	2 9
1934–35	3 0	3 6	3 14	2 8	2 4	2 2	2 15	2 13
1935–36	3 0	3 7	3 9	2 15	2 6	2 5	2 14	2 14
1936–37	3 6	4 2	5 3	3 14	2 11	2 14	4 0	3 10
1937–38	3 4	3 15	4 6	3 2	2 5	2 2	2 15	2 14
1938–39	3 8	3 11	4 0	2 15	2 7	2 4	2 11	2 15
1939–40	3 15	4 4	5 0	3 11	3 1	2 10	2 11	3 13
1940–41	4 3	4 7	4 15	3 13	3 6	3 1	4 9	3 8
1941–42	5 0	5 12	6 11	5 15	5 0	5 0	..	5 5
1942–43	..	10 0	16 6	..	7 11	10 0	..	10 11

STATEMENT III.—*Harvest prices.*

Base prices (per standard maund)—Average five years ending 1928–29.

Rice.	RS. A.	Wheat.	RS. A.
Bengal	6 15	Punjab	4 9
Madras	7 4	U.P.	5 6
Bihar	6 3	C.P. and Berar	3 5
U.P.	7 5	Bihar	6 3
Assam	6 6	Sind	6 8
C.P. and Berar	6 2	Bombay	7 8
Orissa	4 7	N.W.F.P.	4 12
Bombay	8 2	Bengal	6 1
Sind	9 12		
Punjab	3 10*		
N.W.F.P.	3 5*		

* Relates to paddy.

Trend of prices (base—average 1924–25 to 1928–29=100).

Rice.

Province.	Quinquennium ending 1918–19.	1923–24.	1928–29.	1933–34.	1938–39.
Bengal	69	87	100	55	49
Madras	77	103	100	62	52
Bihar	74	93	100	62	55
U.P.	76	112	100	66	57
Assam	77	82	100	53	47
C.P. and Berar	75	105	100	59	53
Orissa	85	100	100	50	55
Bombay	78	103	100	66	57
Sind	75	107	100	65	45
Punjab	82	112	100	57	52
N.W.F.P.	86	141	100	77	57

Wheat.

Province.	Quinquennium ending 1918–19.	1923–24.	1928–29.	1933–34.	1938–39.
Punjab	87	108	100	50	50
U.P.	84	99	100	53	55
C.P. and Berar	79	110	100	55	57
Bihar	83	102	100	60	59
Sind	87	102	100	51	48
Bombay	86	106	100	62	56
N.W.F.P.	84	104	100	57	52
Bengal	80	100	100	64	53

Statement IV.—*Base prices.*

Average of harvest prices during the quinquennium ending 1938–39.

Rice. Province.	Price per standard maund (82-2 lb.). S. A.	Wheat. Province.	Price per standard maund (82-2/7 lb.). RS. A.
Bengal	3 6	Punjab	2 5
Madras	3 13	U.P.	3 0
Bihar	3 6	C.P. and Berar	3 1
U.P.	4 2	Bihar	3 11
Assam	3 0	Sind	3 1
C.P. and Berar	3 4	Bombay	4 3
Orissa	2 7	N.W.F.P.	2 7
Bombay	4 10	Bengal	3 4
Sind	4 5		
Punjab	1 14*		
N.W.F.P.	1 14*		

* Relates to paddy.

Trend of prices (base—average for the quinquennium ending 1938–39=100.)

Rice.

Province.	1939–40.	1940–41.	1941–42.	1942–43.	Minimum during depression period.		
					Price.	Index.	Year to which the price relates.
					RS. A.		
Bengal ..	131	152	159	N.A.	2 10	78	1932–33
Madras ..	113	125	141	220	3 2	82	1933–34
Bihar ..	119	141	161	237	3 1	91	1933–34
U.P. ..	108	129	162	242	3 11	89	1933–34
Assam ..	133	150	158	295	2 6	79	1932–33
C.P. and Berar.	113	148	196	N.A.	2 13	87	1933–34
Orissa ..	126	149	172	254	1 11	69	1933–34
Bombay ..	112	123	173	276	4 4	92	1934–35
Sind	100	116	N.A.	N.A.	4 0	93	1936–37
Punjab ..	123	133	190	317	1 10	87	1930–31 1931–32 and 1933–34
N.W.F.P. ..	107	123	160	357	1 12	93	1938–39

Wheat.

Province.	1939–40.	1940–41.	1941–42.	1942–43.	Minimum during depression period.		
					Price.	Index.	Year to which the price relates.
					RS. A.		
Punjab ..	113	132	216	432	1 9	68	1930–31
U.P.	127	117	177	356	2 5	77	1930–31
C.P. and Berar.	120	124	194	N.A.	2 4	73	1930–31
Bihar ..	115	120	156	270	3 3	86	1933–34
Sind ..	88	149	N.A.	N.A.	2 8	82	1933–34
Bombay ..	119	118	160	391	3 9	85	1935–36
N.W.F.P. ..	126	138	205	315	2 3	90	1931–32
Bengal ..	121	129	154	N.A.	3 0	92	1933–34

N.A.=Not available.

B.—Regulation of Foodgrains Prices

Question.

(i) During the economic depression of the early thirties, the agricultural classes were hard hit as a result of an unduly low level of prices of foodgrains. On the other hand, it has been found necessary, during recent years, to adopt various measures for preventing prices of foodgrains from rising too high and thereby causing serious hardship to the consumers. In view of this experience, do you consider that Government should, in the future, accept responsibility for maintaining even in normal times a system of regulated prices for foodgrains?

(ii) If so, discuss to what extent the various control measures at present in force and the system of supply and distribution developed recently would have to be retained even in normal times. Outline a scheme of measures which in your opinion, would constitute a workable system of regulated prices and ensure a fair minimum price for the agriculturist and a fair maximum for the consumer and prevent undue fluctuations.

Abstract of replies to part (i) of the question

I. *Transition period before "normal times".*—It is emphasized in almost all the replies received from Provincial Governments that "normal times" should not be deemed to begin immediately after the cessation of hostilities; there will be a period following the end of the war during which the present systems of control should continue, with modifications in some respects but without material relaxation. The probable duration of this period of transition from war to peace has been described as "several years" by one Government, "a decade" by another, "some years" by a third, and "two to three years" by a fourth.

2. *The Governments of Madras, Bombay, Orissa, Assam, Sind* and the *North-West Frontier Province* support the view that the responsibility

for maintaining even in normal times a system of regulated prices should be accepted by Government. This is regarded as necessary in order, broadly, to secure the following purposes:—

(i) prevention of extreme fluctuations such as those which occur during an economic depression, and during a war the serious economic and social consequences of which are well known; and

(ii) assuring the agricultural producer—

(*a*) the maintenance of a higher standard of living than before the war; and

(*b*) the incentive for improved production.

The latter of these two purposes has been emphasized generally.

3. (i) *The United Provinces Government* takes the view that maintenance of regulated prices for foodgrains even during normal times would be difficult to carry through successfully unless Government took over the control of the economy of the country as a whole. The trend of the reply is to suggest that the latter, though difficult and expensive, would be practicable.

(ii) *The Bengal Government* has pointed out that "if India, like other countries, decides to adopt a plan of long-term development and employs an up-to-date technique of internal full employment, the stabilization of prices would be a necessary concomitant. On the other hand, if the decision is to work within the existing economic structure, any attempt at price control will raise issues beyond the competence of the province's financial resources." The trend of the reply is to suggest that a system of regulated prices would be so difficult and expensive as to be impracticable.

(iii) *The Bihar Government* is doubtful about its ability to ensure a minimum price for the agriculturists as a permanent measure in normal times. It is in favour of the Central Government fixing prices, controlling movements, and supporting the fixed prices by buying operations "in an abnormal wave of depression when prices of foodgrains fall too low . . . and agrarian distress or dangerous reduction in area under foodgrains is apprehended." In other words, Bihar favours free trade in normal times, limited by occasional intervention by Government (principally the Central Government) for securing the first of the two purposes set out in paragraph 2 above—but not the second.

(iv) *The Punjab Government* says: "In normal times Government should not interfere in the fixation of prices, but when conditions are abnormal and prices fall or rise violently, Government should intervene and regulate prices so as to secure a fair minimum price for the producer and a fair maximum for the consumer." The Provincial Government suggests that the means of carrying this out should be studied by an organization set up by the Central Government.

(v) *The Central Provinces and Berar Government* has expressed the view that, when normal times return, "it would be desirable to allow a more free scope for the operation of the laws of demand and supply, but the price level would have to be constantly watched so that Government may intervene, if necessary, in the interests of the producer and the consumer." This Government also holds that "if the food production drive is to be really effective, minimum price for the agriculturist would have to be guaranteed."

(vi) *The Government of Sind* is in general agreement with the following views of Mr. Roger Thomas (Adviser on Agriculture to the Government of Sind):

"I am strongly of the opinion that not only should Government shoulder the responsibility for fixing statutory maximum and minimum prices for all major foodgrains grown in the country, but that the projected plans for raising the levels of nutrition and the standards of living and the general welfare of the rural population have little chance of succeeding unless the Government does accept this responsibility and implements it. In general, the farmer's greatest dread the world over is that the rains may be unfavourable for the growth or the harvest of his crops, and second only to that dread is his anxiety that the prices he will receive for his surplus produce will be below cost of production. The weather cannot be controlled but prices can. Having regard to the high place he takes in world economy, the farmer is justified in demanding from those in power that everything possible should be done to stabilize the prices of primary agricultural products at fair remunerative levels

to the producer. This is fundamental to all plans for post-war reconstruction, world rehabilitation, and avoidance of future world wars. In India, which is almost self-supporting in the matter of foodgrains, the problem does not present as great difficulties as it does in countries which have to depend in large part on import of foodgrains."

Abstract of replies to part (ii) of the question

1. Among the provinces which have advocated a system of regulated prices, *Madras* is now engaged in the study of a comprehensive scheme. The Board of Revenue, Madras, has expressed the opinion that "the ideal solution for the problem would be to form producers' co-operative societies for each district for dealing in the produce of agriculturists and to exclude all other except the societies from trading in those products." This has not been endorsed by the Madras Government specifically. *Bombay* believes that the present system of controls will have to continue substantially as it stands. The *North-West Frontier Province* has no scheme and suggests study of schemes in force in England and New Zealand.

The Government of Sind endorses a scheme outlined by Mr. Roger Thomas as follows:—

(i) *Fixation of prices.*—"The approach to the problem of fixing fair prices should be, not what the consumer can afford to pay but what is a fair remunerative price to the grower. Having determined the fair maximum prices, which shall be fixed and statutory for any region over a period which may be one year or more, then fix a minimum as a curb on inflation . . . Maximum and minimum prices would have to be co-ordinated on an All-India basis and they would vary as between regions."

(ii *The method of making the prices effective.*—"Trading would be permissible only within the range of the maximum and minimum prices, and it should be made penal to trade outside these prices. Leave the trade to normal channels but with Government reserving the right to buy at any time at the maximum under compulsory acquisition if need be. At the same time, Government should be prepared to buy and to take the prompt delivery of any grains offered at floor prices. If the grains acquired by Government at floor prices are not in immediate demand in other parts of the province or in other regions in India, then they should be considered as buffer stocks to meet the demand in years of scarcity . . . The Government buffer stocks, unless they are required to meet the demand from deficit areas, would be sold each year and replaced by an equal quantity of fresh stocks."

The Orissa Government has outlined a scheme of control on the following lines as the "minimum that would ensure the regulation of prices with the desired object in view":—

"(1) Only persons who are licensed can deal in foodgrains. The licensed dealers' stock will be open to inspection and their purchases, etc., will be subject to control by the provincial authorities; in other words, the Foodgrains Control Order will be substantially continued.

(2) The Provincial Government will notify under the law minimum and maximum prices each year payable to producers. This will permit some small market fluctuations so as to allow the powerful forces of supply and demand to operate within a limited zone. Maximum and minimum prices may also be fixed for wholesale dealers. It may not be necessary to fix retail prices, but such prices may also be fixed if it is found necessary.

(3) It is assumed that some years after the war, conditions will have been established for a parity of prices between one province and another. Indeed, this condition is essential if State interference is to be reduced to the minimum. The prices in each province will be in parity with prices in other provinces and will be determined after mutual consultation. The maximum and minimum prices will be fixed for the whole crop year. The difference between the maximum and minimum should not exceed one or two rupees in the maund, depending on the basic prices.

(4) If the price of a foodgrain tends to fall below the level of the minimum price, then the following measures may be taken by Government to restore the price to the minimum:

(*a*) exports from a surplus province should be stimulated; and
(*b*) Government should make purchases at the minimum price thereby raising the prevailing market price to the minimum price.

If the price of a foodgrain tends to rise above the maximum, then the Government will—
(*a*) ban exports for the time being; and
(*b*) release their own stocks into the market at lower than the maximum prices.

(5) Provincial Government will maintain a suitable and adequate reserve of foodgrains to be used as a stabilizing factor as regards prices and for the purpose of alleviating distress or shortage should this occur in any area within its territory. For this limited purpose the Provincial Government may also set up a machinery for distribution. Beyond this, however, the Provincial Government will not undertake procurement or distribution which will be left to normal trade channels subject, of course, to the control of Government under the Foodgrains Control Order.

(6) There will be no inter-provincial ban on export except when prices rise above the maximum price of a foodgrain as explained in (4) above.

C.—Agricultural wages

Question

How have agricultural wages risen in comparison with the prices of foodgrains during the war? Do you expect wages would adjust themselves to a system of regulated prices in normal times or do you consider special measures would be necessary to secure such adjustment?

Abstract of replies

1. Provincial Governments generally agree that wages will adjust themselves to a system of regulated prices in normal times. It is also emphasized in most of the replies (*a*) that the rise in agricultural wages has been due not only to the rise in foodgrains prices but also to the rise in prices of other essential commodities and to large demands for labour in war industries and defence works; (*b*) that there will be a time-lag before wages completely adjust themselves to regulated prices; (*c*) that, in any case, wages will remain at a much higher level than before the war, owing to increased demand for labour from industries. The Punjab Government, on the other hand, is apprehensive of agricultural wages falling too low in the wake of demobilization, and considers legislative action to be necessary for enforcing minimum wages. The Orissa Government also holds that it is likely that for some time after the war is over, the supply of labour will be greater than the demand, with the result that the wages may not keep pace with the regulated prices. It is, therefore, considered desirable by that Government to correlate agricultural wages to regulated prices in normal times. The unorganized state of agricultural labour as a factor in neutralizing legislative action for enforcing minimum wages is generally recognized.

2. *Assam.*—It is stated that prices of foodgrains rose proportionately much above wages of agricultural labour up to 1943. Since then, the prices of foodgrains have been reduced gradually to levels on a par with wages of agricultural labour and in some areas even lower. It is believed that in normal times wages would adjust themselves to a system of regulated prices. The rise in wages is attributed by certain officials not only to the rise in the price of foodgrains but to the large demand for unskilled labour in urgent military works. Special measures to regulate wages now and after the war according to circumstances are also considered necessary by certain other officials.

3. *Bengal.*—The average 1939–40 wages for the province as a whole ranged from 3¼ to 4¼ annas. The rise in agricultural wages generally followed the rise in foodgrains prices.

Wages.		Price of foodgrains (average of cereals and pulses).	
Base 1939–40	100	Base 1939	93
1940–41	110	1940	100
1941–42	115	1941	109
1942–43	125	1942	160
1943–44—		1943	385
First half	130		
Second half ..	200 to 300	1944 (first seven months) ..	280
1944–45—			
First half ..	400 to 500		

The above statement represents the increases in wages in the province generally. In certain areas, however, where military or civil defence works were in progress or where there has been a serious depletion of agricultural labour owing to famine and epidemics, the increase in wages during the years 1942 to 1944 has actually been phenomenal. Though the price of rice fell towards the end of 1943, wages continued to rise possibly due to a steady rise in the prices of other essential commodities.

On the question whether the wages will adjust themselves to a system of regulated prices *in normal times*, the Government of Bengal anticipates that this adjustment will be at a relatively higher level than in pre-war years. The factors governing wages are stated to be (*a*) the number eventually available for agricultural pursuits, (*b*) depletion of agricultural labour resulting from the famine of 1943 and the epidemics that followed, (*c*) migration from distressed areas to other provinces, (*d*) impetus given to agricultural labourers by the Grow More Food campaign.

The difficulty in linking wages to cash standards for purposes of regulation of wages as these are mostly paid in kind, is referred to by an officer of the Bengal Government.

4. *Bihar.*—The Bihar Government has no accurate data regarding the rise in agricultural wages, but a considerable increase in wages particularly in areas where there has been military activity has been noticed. In many parts of the province, agricultural wages are paid in kind. The Government is of the opinion that any special measures to secure adjustment between agricultural wages and regulated prices should be preceded by an exhaustive enquiry.

An officer of the Bihar Government takes the view that wages will take a considerable time to adjust themselves to regulated prices in normal times; for, the rural wage earner, though always living on the brink of starvation, is very weak in bargaining power and would perhaps involve himself more heavily in debt to the Mahajan.

A non-official view from Bihar is as follows: "Wages like prices have got a tendency to rising abruptly and falling very slowly . . . Though I believe that on the fall of prices the wages will fall, it will take a long time for it to adjust . . . But if demand for labour increased, fall in wages would be difficult."

5. *Bombay.*—Agricultural wages have risen to a greater extent compared to prices of foodgrains. This is due to the competing demand for labour from war industries and defence works and to the rise in prices of other consumer goods. While wages will adjust themselves to the fall in prices, it is considered unlikely that there will be any appreciable fall in agricultural wages owing to the possibility of some agricultural labour being absorbed in the post-war industrial enterprises.

6. *Central Provinces and Berar.*—Government considers that agricultural wages and foodgrains prices have been rising side by side. It is, however, expected that wages would, to some extent, adjust themselves to a system of regulated prices in normal times, though there would be fluctuations in the rates according to supply and demand varying from season to season. An organization for registering and pooling agricultural labour and arranging for their movement to areas of short supply may help to stabilize wages.

7. *Madras.*—The Board of Revenue, Madras, has given the following figures based on the wage census held in 1936 and 1941:—

	Presidency average for rural labourers.																	
	Artisans.						Field labourers.											
							Men.						Women.					
	Cash.			Grain.			Cash.			Grain.			Cash.			Grain.		
	Rs	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
Pre-war year 1936	0	11	0	0	7	3	0	4	3	0	3	5	0	2	10	0	2	9
War year 1941 ..	0	11	0	0	6	4	0	4	5	0	3	11	0	3	2	0	3	3

Information obtained from District Officers in 1943 does not indicate any change in the previous method of payment of wages. Wages in cash have risen by 100 per cent over the pre-war rates. Even the maximum increase of 100 per cent is much less than the percentage increase in prices of foodgrains, the index numbers for which at the end of 1943 (with 100 in August 1939) were—

Rice (II sort)	247·37	Cumbu	321·65
Cholam	354·93	Ragi	339·59

Wages, therefore, did not adjust themselves completely to increased prices at the end of 1943. From past experience, however, the Board of Revenue expects that wages would rise in keeping with prices though tardily, and that wages will adjust themselves to a system of regulated prices; there will always be a time-lag depending upon demand and supply, union among labourers, etc.

The Director of Agriculture, Madras, estimates the increase in wages at 200 per cent in most districts. In his opinion, "wages seldom adjust themselves automatically to changes in prices. There is always an annoying time-lag. It is difficult to fix and enforce payment of minimum wages in particular fields, as this might lead to the installation where possible of labour-saving machinery. Agricultural labourers are far too scattered and ignorant and unorganized for the State to help them by enforcing payment of minimum wages. Subsidy or some other form of help may be given by way of cheapening of foodstuffs and clothing, providing houses, water-supply, medical relief, etc."

A non-official from Madras is also of the view that "it can be categorically stated that the wages will never adjust themselves to a system of regulated prices. It has not happened so even in abnormal times such as those through which the country is passing now. Much less will that happen in normal times. . . I do not see why minimum wages should not be fixed."

8. *North-West Frontier Province.*—The normal method of paying the farm labourer is by giving him a share of the crop on the threshing floor. Wages in cash are uncommon in the province. A system of regulated prices would, in the opinion of the Government, protect the actual labourer from exploitation and secure for him a fair price for his share of the crop.

9. *Orissa.*—Wages paid in cash have not risen in the same proportion as the price of staple foodgrains. The average wages of an unskilled male labourer during 1941, 1942 and 1943 were 4 annas, As. 4–3, and As. 5–3, respectively. With the rise of foodgrains prices, wages have increased in urban areas since the latter half of 1943, but wages of landless labourers in rural areas remained much the same. It is likely that for some time after the war is over, the supply of labour will be greater than the demand with the result that the wages may not keep pace with the regulated prices and it is, therefore, desirable to fix agricultural wages both of cash and kind statutorily in such a manner as to secure an adjustment to the system of regulated prices of staple foodgrains in normal times. It is, however, realized that fixation of agricultural wages by statute may be difficult to enforce unless the agricultural economy is reorganized on a co-operative basis. The Orissa Government also points out that, as a result of the rise of foodgrains prices, the difficulties of agricultural labourers have increased owing to the unwillingness of the landholders to pay them in kind in the areas where such payments were usual.

10. *Punjab.*—Generally speaking, the wages of agricultural labour have risen practically to the same level as the prices of foodgrains, as will be seen from the following figures:—

	Average price of food-grains.		Average wages.		
			Unskilled labourer.	Skilled labourer.	
	RS. A. P.		RS. A. P.	RS. A. P.	
1938–39	2 5 9	1937 ..	0 6 0	0 14 0	
1943–44	7 9 2	1943 ..	0 15 0	2 2 0	

The above figures indicate an increase of about two to three times the pre-war level of wages. The Provincial Government believes that ordinarily wages should readjust themselves to regulated prices of foodgrains

in normal times, but that in the event of unregulated demobilization—(about 2 million people from the Punjab are serving in the Defence Forces and in the War and Supply Department contracts)—there is a danger of a disproportionate fall in wages. In that case, it may be desirable to adjust wages by legislative action.

11. *Sind.*—Most farming in Sind is done on the "batai" or crop-sharing system. Generally wages are paid in kind. In the case of food-grains the percentage of crop which the harvester demands has not changed during the war, and he thus gets the benefit of the higher price of his share of produce. Where wages are paid in cash, e.g., in the picking of cotton, they have risen to about two and half times the pre-war rates. The Provincial Government expects that wages will adjust themselves to a system of regulated prices, though there will inevitably be a time-lag before the adjustment is complete.

12. *The United Provinces.*—Past experience has shown that wages always move in sympathy with the general trend of prices. Rural wages tend to go ahead of the prices and while coming down move more slowly than the prices. With an increased demand for skilled labour, wages of unskilled labour may, however, go down eventually. If regulated prices actually rule in the market, the movement of wages should of course be governed by them. But factors such as the growth of industries checking the fall in wages and the increase in population bringing down the level of wages have to be reckoned with.

APPENDIX V

RURAL INDUSTRIES AND EMPLOYMENT

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RURAL INDUSTRIES AND EMPLOYMENT

Questions

(1) What are the industries subsidiary to agriculture in your province? Describe the efforts made by Government or other agencies to develop such industries during the twenty years ending 1941-42. Assess the results of such efforts from the point of view of provision of supplemental income to small cultivators and reduction of the numbers of those people too poor to secure a sufficiency of foodgrains and therefore underfed at least during certain parts of the year. What would you recommend as the most promising measures from this point of view?

(2) It has been suggested that the principle underlying famine relief should be extended and that Government should undertake even in normal times the obligation to provide food or purchasing power to all persons who are unable to secure food and who, if able-bodied, are willing to work. Do you agree with this view? If so, can you outline a scheme of organization of such relief, describing in particular the types of work which may be prescribed, and the agency by whom relief may be administered efficiently and economically? Can you roughly estimate the probable average net cost per day of such relief?

A.—Replies to question (1).

1. *Assam.*—The following are the principal industries subsidiary to agriculture in Assam: Handloom weaving, sericulture, bell-metal and brass works, iron work, manufacture of washing soaps, manufacture of steel trunks, carpentry, smithy, gold and silver work, cane and bamboo work, pottery, manufacture of rubber stamps and hosiery.

Hand-loom weaving and sericulture, which are the most important cottage industries of the province, have developed considerably during the last twenty years. This development is particularly due to the grant of subsidies by the Government of India since 1935-36. During this period the number of fly-shuttle looms introduced by the department through demonstration staff has more than doubled, the production of handloom fabrics has largely increased and the weavers have been enabled to earn larger incomes.

As regards sericulture, the propaganda and the demonstration staff maintained by the department has made great contributions to the expansion of the industry and in the increase of silk production. As a result of the large demand for cane and bamboo baskets and mats for the defence services, the cane and bamboo industries have undergone great development during the last four years and have given considerable supplementary income to the agriculturists.

The other cottage industries mentioned above have not, however, made much progress during the period. Due to the scarcity of raw materials, the bell-metal brass and iron industries have in fact definitely deteriorated during the last three or four years.

As the harvest raised by small cultivators—whose number will be between 30 per cent to 40 per cent of the population—does not yield a sufficient income to meet their expenses in connexion with the payment of land revenue, marriages and other ceremonies, the education of their children, construction of houses, etc., they must be provided with facilities for earning a subsidiary income and this can best be done by means of a network of well-organized cottage and small-scale industries spread all over the province and receiving active assistance and guidance from Government particularly as regards (i) the provision of raw materials at cheap rates and in regular and sufficient quantities, (ii) facilities for marketing the products at profitable rates, (iii) acquisition of skill of a sufficiently high order and (iv) processing of raw materials or finished goods, wherever necessary.

2. *Bengal.*—(1) Handloom weaving in all its branches, viz., cotton, silk and jute, is the most important cottage industry of the province subsidiary to agriculture in which a very large number of people are engaged. As any improvement in the economic well being of this very large section of the rural population is bound to reflect its wholesome effects on the rural well-being as a whole, the Provincial Department of Industries since its creation in 1920 have been directing its attention to this end and can now claim to have set up a net work of organization all over the province. Besides two first-grade weaving institutions, the department maintains nine District Weaving Schools, 29 Peripatetic Weaving Schools, and 16 Weaving Demonstration Parties with the object of giving the agriculturists and other rural population practical training in the industry so as to enable them to take it up as a whole-time or part-time occupation with a view to augment their income derived mainly from agriculture. In addition to the above the department also makes grants-in-aid to 47 non-Government Weaving Institutions mainly engaged in popularizing and developing the handloom industry. As in regard to cotton weaving so also in respect of silk-weaving, efforts have been made to improve the industry in all its distinct but inter-related stages embracing cultivation of mulberry, rearing of cocoons, reeling, spinning, weaving and marketing of finished products. As a result of these efforts nearly 17,000 students have been trained during the last twenty years ending 1941-42 of whom about 13,000 have adopted weaving as a profession part time or whole time. The total number of looms introduced during this period is approximately 10,000. Besides the weaving industry, coir spinning and weaving has also received due attention of the department and for this purpose four Demonstration Parties have been in operation for a pretty long time. The coir industy has evidently provided the agriculturists with a subsidiary occupation in supplementing their incomes.

(2) In addition to the above the department since 1932 has been maintaining 26 Peripatetic Demonstration Parties for giving ocular demonstration of and practical training in improved methods of (1) metal casting and polishing, (2) cutlery, (3) pottery, (4) umbrella making, (5) soap making, (6) boot and shoe making and (7) tanning. As all these industries require technical training and skill and can obviously be taken up only as a whole-time occupation providing livelihood to certain sections of the rural people excelling in those arts, these can hardly be considered as providing subsidiary occupation to agriculture though they may be considered to play an important part in training about the economic well being of the rural population.

(3) Although it is difficult to assess with any degree of accuracy the results of the above efforts from the point of view, inter alia, of supplemental income to cultivators, it can safely be stated that they have given a definite impetus to adoption of these industries as an occupation by the rural people particularly the agriculturists in supplementing their income to some extent.

(4) As regards measures that may be recommended to achieve the objective in view, it may be stated at the outset that the reorganization of the handloom industry envisaging inter alia the supply of yarn, etc., to cottage workers and finally the marketing of their finished products appears to be the most promising of all measures that needs implementation immediately. With this end in view, a comprehensive scheme is now under careful consideration of Government. The scheme has already been considered by the Council of Ministers and is now being scrutinized in the light of the directions given by them. Next to handloom weaving, the salt and the hand-made paper industries appear to have great promise of success in this province. Apart from their general usefulness even in normal times, the present abnormal situation presents an unique opportunity for developing these industries and these have already been taken up by the department. In regard to salt, 11 warehouses are already in existence in the three coastal districts of 24 Parganas, Midnapore and Chittagong where cottage workers are permitted to dispose of their non-duty-paid salt at reasonable prices leaving a margin of profit to them. It is in contemplation to extend the warehousing scheme to the remaining coastal districts of this province in the very near future. As regards hand-made paper three Demonstration Parties have been set up to demonstrate the methods of hand-made paper manufacture to the cottage workers. A proposal for the establishment of additional 27 such Demonstration Parties is also now under consideration.

3. *Bihar*.—(i) The following are the industries (cottage) subsidiary to agriculture in Bihar:—

Textile Industries—
(1) Cotton weaving,
(2) Cotton spinning.
(3) Sericulture.
(i) Mulberry.
(ii) Eri rearing and spinning.
(iii) Tasar rearing and reeling.
(iv) Silk and Tasar weaving.
(4) Wool shearing, spinning and weaving.
(5) Carpet and *durrie* weaving.
(6) Rope making.
(7) Mat weaving.
(8) Dyeing and printing.
(9) Tailoring, embroidery and needle work.

Wood working Industries—
(1) Sawing.
(2) Furniture making or carpentry.
(3) Bamboo work and basketry.
(4) Paper making.

Chemical Industries—
(1) Manufacture of lac and lac bangles.
(2) Extraction and refining of saltpetre and Khari.
(3) Washing soap making.
(4) Manufacture of catechu (Kath)

Metal Industries—
(1) Village smithy.
(2) Cutlery on small scale.

Pottery—
(1) Village pottery.
(2) Brick and tile manufacture.

Leather Industries—
(1) Tanning.
(2) Manufacture of foot wear and leather goods.

Miscellaneous—
(1) Oil pressing.
(2) Butter and ghee making.
(3) Poultry farming (on small scale).

(2) *Government assistance*.—(*a*) Of the various industries mentioned above, hand weaving is the most important and therefore it received the greatest attention of Government. When the Department of Industries was started in 1920, there were in Bihar only two Cottage Weaving Demonstration parties (excluding two such parties for Orissa) and a weaving school at Biharsharif with the object of training handloom weavers. During the period from 1920 to 1942 much improvement was made in the various industries mentioned above with the result that at the beginning of 1942 there were under the Department of Industries the following organizations working for the benefit mostly of the rural population.

(i) Seven itinerant cotton weaving demonstration parties each consisting of one weaving supervisor and seven weaving mistries for demonstration and introducing labour-saving hand appliances and processes of manufacture among the handloom weavers.

(ii) One itinerant dyeing demonstration party consisting of a supervisor and seven mistries for display and introduction of improved methods of dyeing and the use of modern dyes.

(iii One itinerant wool weaving demonstration party consisting of a supervisor and four mistries for display and introduction of improved appliances and processes in the manufacture of woollen goods.

(iii) One itinerant wool weaving demonstration party consisting five eri-rearing Inspectors for training the prospective agriculturists in the rearing of eri-silk worms, distribution of disease free eri-seed eggs and introduction of improved *charkhas* and *taklies* for spinning eri-cocoons into yarn.

(v) One itinerant demonstration party for teaching the "chamars" in the improved method of tanning on cottage lines.

(vi) One itinerant demonstration party for teaching the "mochis" in the improved processes of manufacture of footwear and other leather goods.

These demonstration parties move in the interior, mix with the rural population and train them in learning the various cottage industries according to their taste. Of late not only the professional classes and castes but some other non-professional people have also taken up some of these industries as a subsidiary profession.

(*b*) In addition, the Department of Industries maintains the following handicraft institutions to impart training in various handicrafts to young men of the poor, middle and professional classes. The educational

standard for training in these institutions has been kept low, *viz.*, up to upper and middle standard so as to suit the poor agriculturists and artisans who cannot afford to have higher general education—

Name of Institutions.	Courses taught.
(1) Cottage Industries Institute, Gulzarbagh (Patna).	Cotton weaving, dyeing and calico printing, tailoring, glazed earthenware and pottery manufacture, cane furniture and basket manufacture, knitting, Carpet weaving, durrie weaving, newar and tape weaving, lacquered toy making, wooden toy making, card-board toy making, hand-made paper making.
(2) Government Silk Institute, Bhagalpur.	Silk worm rearing, spinning, weaving and dyeing.
(3) Government School of Handicrafts, Pusa.	Weaving, tailoring, carpentry, bell metal, basketry, rope making, eri rearing.
(4) Wool Weaving Institute, Gaya.	Manufacture of woollen goods.
(5) Half-time Weaving School, Bihar-sharif.	Weaving, general education up to middle standard.
(6) Printing and Book Binding classes, Gulzarbagh.	Composing, printing and book binding.
(7) Women's Industrial School, Jharia and Kustore (closed in December 1942).	Cotton weaving and Cane basketry.
(8) Two itinerant Industrial Schools for women and girls.	Hand spinning, needle work, embroidery, basket making, and cutting and tailoring.

(*c*) In addition, the Industrial Diploma classes of the Bihar College of Engineering, Patna, the Dehri Workshop Technical School, Dehri, the Tirhut Technical Institute, Muzaffarpur, and the Ranchi Technical School at Ranchi impart training in wool, metal and engineering trades including electric engineering—the latter two institutions impart training in leather work also. The Industrial Chemistry section attached to the Science College at Patna train some young men in soap-making, etc., and has also taken up demonstration in the improved method of *kath* manufacture. Various handicrafts are also taught to the convicts at the Reformatory School at Hazaribagh.

(*d*) Some district boards and private parties are also maintaining a number of handicraft institutes which receive grant-in-aid from the Department of Industries.

(*e*) The department also maintains two Seed Supply and Research Stations, i.e., one for eri at Ranchi and the other for tasar at Chaibassa with three tasar sub-stations at Amarapara (Santal Parganas), Hura (Manbhum) and Giridih (Hazaribagh). These Seed Supply and Research Stations distribute disease free seed eggs to the prospective eri and tasar silk worm rearers.

(*f*) As already mentioned above, of the various cottage industries handloom weaving is the most important. According to the census of 1921, there were 94,984 primitive handlooms and 391 flyshuttle looms working in Bihar in that year. The Department of Industries has been trying to replace the primitive handlooms with improved flyshuttle ones which is estimated to increase the production capacity of the weavers by 50 to 100 per cent. Much success was achieved in this direction. In a handloom census conducted by the Department of Industries in 1942 it was found that there were as many as 38,915 improved flyshuttle looms (34,359 working and 4,556 idle) besides 64,147 primitive looms (49,195 working and 14,952 idle) in Bihar in the year 1942. The handloom weavers using flyshuttle looms earn increased wages on account of their higher production capacity than the weavers using primitive handlooms.

(*g*) With a view to help the handloom weavers in marketing their products, two handloom marketing organizations are being maintained, *viz.*, (i) the Bihar Cottage Industries at Gulzarbagh, Patna, for the marketing of cotton textiles, (ii) the Government Wool Emporium, Gaya, for the marketing of the woollen goods. These marketing organizations purchase raw materials in bulk, supply the same to the handloom weavers

working for them for weaving them into cloths against standardized patterns and designs, and purchase their woven goods at fixed prices for sale through Central Warehouses at Gulzarbagh and Gaya and a large number of sales agents appointed in different parts of India and a few also abroad. Thus, these marketing organizations provide steady work and wages to a large number of weavers—professional and non-professional, coming mostly from the agriculturists classes. Under the scheme for the handloom marketing organization at Gulzarbagh, Patna, the Co-operative department has also organized and is running 9 Weavers' Co-operative Societies with 219 weaver workers (in 1942). These Weavers' Co-operative Societies are also getting steady work from the Bihar Cottage Industries for their weaver members.

(3) In addition to what has been done by Government, the All-India Spinners' Association (Bihar Branch) has been assisting the ancient hand-spinning industry and manufacture of khaddar cloth. This gives subsidiary work to a large number of khadi weavers and poor women-folk who spend their leisure time in hand-spinning and thereby augment their income to some extent.

(4) It is difficult to assess the results of the efforts described above from the point of view of supplemental income to cultivators or reduction of the number of those who are underfed. But there can be no doubt that those who have availed of the opportunities offered by the department have made a substantial addition to their ordinary income from agriculture.

It must be noted, however, that the efforts of the department have touched only a small percentage of the population.

(5) The number of underfed small agriculturists will be reduced if their earning capacity is increased. The following measures may be considered among others:—

(1) Extensive industrialization offering new scope of employment and reducing the pressure on land.

(2) Increasing the yield from land by improved methods of agriculture, use of better seeds, manures, extension of irrigation facilities, consolidation of holdings where possible, etc.

(3) State providing further opportunities on the lines mentioned above to cultivators to take up to subsidiary cottage industries to be provided by them, assistance and facilities for learning the technique, introducing improved appliances and processes and standardization of the products to make them marketable, and co-operative purchase of raw materials and sale of finished products.

An officer of the Government of Bihar has expressed the following opinion: "Almost every occupation in the rural economy of this province is combined with cultivation. Thus a bania, carpenter, blacksmith, oilman, washerman, potter, cobbler, etc., all have some lands to cultivate. Dairy farming, poultry-keeping, goat rearing, soap-making, basket-weaving, spinning and weaving are some of the subsidiary industries followed. The nature of the subsidiary industry varies from locality to locality. Thus in Manbhum and Ranchi districts growing of seed lac is followed by many cultivators, as rearing of cocoons is done to some extent in the district of Santal Parganas. Unfortunately, however, many of these industries are still followed on a caste basis, and many have scruples against taking up any and every trade. Fruit growing and orchard keeping are followed to some extent, but their possibilities are limited by the ill-developed transport facilities. Government have done little to develop subsidiary industries except spinning and weaving, which have also received some stimulus from the Indian National Congress. Manufacture of utensils (of iron, brass and bell-metal) and glass bangles and pisciculture are some of the subsidiary industries that can be suggested. Provision of cheap electricity and easier and quicker transport may do something to encourage small industries in the villages, but the competition from large-scale organized industries is always a factor to be reckoned with. The subsidiary industries must be such as will not require much skill and capital and will find their market mainly in the village itself, if not consumed by the workers themselves. I am, however, not very hopeful about subsidiary industries being able to do much either in the way of increasing the standard of life of the cultivator to any appreciable extent or enabling him to lean on it when his crops fail."

4. *Bombay.*—The most important industries subsidiary to agriculture are spinning, weaving, cattle-breeding, poultry-farming and dairying. The cottage industries are wool spinning and weaving, knitting, calico printing and dyeing, rope-making, carpentry, wood-turning, blacksmithy, pottery, soap-making, cane work, basket-making, paper-making, gold and silver thread manufacture, brass and copper vessel manufacture, oil industry, tanning, shoe-making, lacquer work, coir manufacture, bangle-making, silk-worm rearing, bee-keeping, fruit-canning, sandalwood and ivory carving, goldsmithy, snuff and *bidi* making and *gur* making.

The Department of Industries was reorganized in 1928 and since then its activities have generally expanded. The department carries out surveys of different industries with a view to their development and meeting the difficulties experienced by them. It also carried out research both in respect of improvement of technique and utilization of raw materials. Propaganda and education are necessary for the adoption of improved methods and appliances and these are carried out with the help of demonstrations, exhibitions, weaving and other schools, institutes and classes conducted by the department and peripatetic demonstration parties. A list of demonstration parties sanctioned in recent years will be found at the end of the reply. Stipends and scholarships are also provided for industrial and technical education. It is also essential to help the cottage worker in disposing of his output and for this purpose departmental sales depots have been established at Bombay, Surat, Nasik and Belgaum.

Commercial and industrial intelligence is supplied to the producers and they are kept in touch with the constant changes in demand. They are also helped in obtaining transport facilities for their produce. With regard to the handloom industry, which is the most important industry in this Province, Industrial Co-operative Associations have been established with the following objects:—

(*a*) Supplying to weavers improved appliances on the hire-purchase system;

(*b*) supplying them with raw materials at cheap rates;

(*c*) advising the weavers with regard to production of improved and easily marketable designs and patterns;

(*d*) undertaking preparatory and finishing processes of dyeing and printing works in connexion with the handloom industry; and

(*e*) accepting on consignment account, against partial payment, of handloom products from weavers and also purchasing pure handloom products and selling the same.

Orders have also been issued to Government departments to purchase products of cottage industries as far as possible.

In the field of finance, subsidies and loans are given to trained artisans and educated unemployed to start new industries. Loans are also given to small industries for purchase of machinery, raw materials, etc. A copy of orders regarding the loan and subsidy scheme is appended. Grants are given to the All-India Village Industries Association for schemes of cottage industries and to the Sisal Fibre Institute, Ahmednagar, for training students in the manufacture of articles from sisal and aloe fibre.

The war has given impetus to many existing and new industries. The department obtains orders from the Supply Department and gets them executed through the small-scale industries.

It is not possible to state, without elaborate enquiries, the result obtained by the help and advice given by the Department of Industries, but the rural artisans have benefited from the advice.

A list of demonstration parties sanctioned in recent years:—

(1) Demonstration party for the development of cane and bamboo work.

(2) Peripatetic demonstration party for imparting training in methods of extracting fibre from hard and soft hemp and the manufacture of articles like thread, twine, etc.

(3) Dyeing demonstration party.

(4) Peripatetic demonstration party for imparting training in coir brush-making and rope-making.

(5) Peripatetic school for training in the manufacture of boot-laces, strings, bandings, niwars, etc.

(6) Peripatetic demonstration party for training village lohars and sutars in turning out better class articles.

(7) Demonstration party for development of lacquer work industry.

(8) Additional demonstration parties for training in—

(i) cotton weaving;

(ii) wool weaving;

(iii) tanning;

(iv) cane and bamboo work;

(v) carpentry and wood turning,

(vi) leather working;

(vii) smithy; and

(viii) fibre manufacture.

5. *Central Provinces and Berar.*—(1) The following may be considered as industries subsidiary to agriculture in this Province:—

(1) Paddy husking, (2) Flour-grinding, (3) Gur making, (4) Bee-keeping and honey production, (5) Cotton ginning, carding, spinning and weaving, (6) Sheep-breeding, (7) Sericulture, (8) Mat weaving, (9) Rope-making, (10) Dairy farming, (11) Poultry rearing, (12) Lac industry, (13) Bidi making, (14) Basket making, (15) Dal milling, (16) Wood cutting and charcoal burning.

Actually very little has been done in the past to develop such industries either by official or non-official agencies. Of the industries mentioned above, hand-spinning has received the greatest attention in the province both from Government and other agencies, because for various reasons this industry is an ideal part-time cottage industry for the agriculturist. From 1938 to 1942 Government gave a grant-in-aid to the All-India Spinners' Association for working a scheme for the development of this industry. The Association has been doing research in the methods of spinning with a view to adding to the efficiency of the spinners. It is claimed that on the latest model of Charkha evolved by the Association an individual worker can earn about Re. 0-8-0 a day. A scheme for the development of the sericulture industry (mulberry silk) financed equally by the Central and Provincial Governments is also being worked in the province since 1938. Among the non-official agencies working for the development of these industries, the most active is the All-India Village Industries Association which is running a school at Wardha for training men in village industries like oil-pressing, making of hand-made paper, bee-keeping, paddy husking and flour-grinding. The Provincial Government has been giving a grant-in-aid of Rs. 1,800 per year to this Association.

(2) It has, however, not been possible so far to assess the results of these efforts in providing a supplementary income to small cultivators or in reducing the number of underfed villagers. It is suggested that a suitable measure to achieve these objects would be the creation in the Department of Industries of a cottage industries section under an officer of the rank of Deputy Director whose function it will be to explore the possibilities of finding part-time cottage industries suitable for both men and women in rural area. Another suggestion is the establishment of a District Industrial Association and a Cottage Industries Emporium in each district of the province for supplying raw materials to cottage workers and disposing of their finished products, together with a Central Cottage Industries Institute at Nagpur in charge of an engineer. The Provincial Government has not yet planned a definite line of action in this matter. The lines on which these industries can best be encouraged in the province are being examined by a recently constituted Provincial Industries Committee.

6. *Madras.*—The industries subsidiary or supplementary to agriculture in the province are hand spinning, hand weaving, carpet and cumbly weaving, hand-made paper, oil pressing, soap manufacture, sheep breeding, poultry farming, bee-keeping, coir and rope-making, mat and basket weaving, cutlery, cattle breeding and dairying, hand-pounding of rice, slate manufacture, malt-making, glass bangle industry, cotton pressing and groundnut decorticating, and ericulture, etc.

The importance of industries which are suitable as subsidiary occupations for the agriculturists who are compelled to be out of employment for some months of the year was emphasized by the Royal Commission on Agriculture and the Central Banking Enquiry Committee. The Madras Government was one of the earliest of Provincial Governments to devote attention to the development of rural industries. They ordered an elaborate survey of the cottage industries in the province. A Special Deputy Collector was appointed to conduct the survey and his report was published in 1929. Since then, efforts have been made to develop the cottage industries in the light of the suggestions made in the report. The State Aid to Industries Act (1923) was amended in 1936, liberalising its provisions so as to render financial assistance to cottage industries also. In the same year, Government also set up District Economic Councils, one of their functions being the examination of the question of suitable cottage industries that should be introduced as subsidiary to agriculture. These Councils were, however, dissolved in 1937, as they had no statutory sanction behind them. Since then, the Collectors of districts have been empowered to call periodical conferences of District Officers and members of the Provincial Legislature from the district. Collectors have been requested by Government to conduct surveys of important cottage industries in the districts and submit proposals for developing the industries after placing them before periodical conferences. All Collectors have submitted reports to Government and in many cases they have suggested the organization of co-operative societies to revive the industries. It has been recognized that a promising line of developing cottage industries is through co-operative societies. The Madras Committee on Co-operation (1939–40) which examined the question was also of the same opinion and has observed as follows: "We are satisfied, therefore, that cottage industries have a future and that the co-operative principle has a large part to play in their development."

The question of organizing cottage industries co-operative societies in the province is receiving the serious attention of the Registrar of Co-operative Societies, Madras. There is a well-developed co-operative organization for the handloom industry, but though this is of considerable size it covers the activities of only a small proportion of the large number of handloom weavers in the province. A few societies have been organized for the promotion of some of the other cottage industries. On 30th June 1944, there were 141 cottage industries co-operative societies exclusive of weavers' societies, milk-supply and ghee production societies. The Madras Provincial Co-operative Bank has voted a sum of Rs. 5,000 in 1943–44 and another sum of Rs. 5,000 in 1944–45, for the development of cottage industries. Out of this sum, instructors have been appointed for hand-made paper, for coir, for leather goods, for pottery; and societies for these industries are being built up. Out of the same grant, lady instructors for embroidery and tailoring have been appointed. Six cottage industries societies for women have been organized and they are being built up. The Government have sanctioned the appointment of a woman special officer for the organization of and development of women's cottage industries co-operative societies.

The progress achieved in other directions has not been on a par with even the limited progress made in the handloom weaving industry. The Madras Committee on Co-operation (1939–40) has recommended the establishment of a separate Provincial Industrial Co-operative Society similar in constitution and functions to the Madras Handloom Weavers' Provincial Co-operative Society and this institution should organize and administer primary production societies to be established for cottage industries. The greatest need for the development of cottage industries is trained instructors who will sit with the workers and train them. A central institute of cottage industries where cottage industries will be taught on business lines with a system of apprentices who may become workmen in the institute itself is necessary. The services of these men will be available to the co-operative institutions which can pick and choose out of them for their own improvement. Co-operative societies for cottage industries require very frequent inspection and guidance by co-operative officers. They cannot afford this as their hands are too full with various activities resulting from the conditions created by the war and with statutory duties which have increased in recent years. There are considerable possibilities for the development of cottage industries on co-operative basis, if more Special Deputy Registrars are appointed solely for the purpose.

An exhaustive note on the "Economic resources and cottage industries of the Ceded Districts and their possibilities of development" was prepared for the Famine Code Revision Committee (1938) by the then Director of Industries and Commerce, Madras.

The Ceded Districts Economic Development Board has been giving special attention to the development of cottage industries in these districts and the progress is as stated below:—

(*a*) *Handspinning*.—Though handspinning might appear to be a promising subsidiary occupation for the agriculturists, especially in the Ceded Districts, where cotton is one of the two main commercial crops and covers a very large area, its development is beset with difficulties. (At present it does not exist in Bellary and Anantapur and even in the other two districts it is restricted.) The main difficulties which stand in the way of its development are said to be (i) it does not appear to be an economic proposition and consequently people do not take to it readily; (ii) handspun cloth has only a restricted market.

Two schemes which were drawn by the All-India Spinners' Association for the Adoni and Kurnool taluks were sanctioned some years ago. Government have recently sanctioned a grant of Rs. 4,626 and a loan of Rs. 4,000 recoverable at the end of three years to the Rayalaseema Moola Khadi Prathisthapanam, Tadpatri, for the development of the handspinning industry in Yemmiganur and Gudur of Bellary and Kurnool districts, respectively, by training 200 spinners at the two centres.

(*b*) *Handloom weaving*.—Handloom weaving is of considerable importance in all the districts and is generally followed as a wholetime occupation by a particular class of people. The Co-operative department is encouraging its development by forming co-operative societies for the weavers wherever conditions are favourable. There are 26 weavers' co-operative societies in these four districts at present.

(*c*) *Cumbly industry*.—The tending of sheep and the weaving of cumblies form the main occupation of the Kurubas in the districts of Bellary, Anantapur and Kurnool who also engage in agricultural pursuits in the agricultural seasons. In this case also, attempts are being made to develop the industry by the formation of co-operative societies and there are at present four such co-operative societies in three districts. Experiments are in progress for improving the breed of the sheep by introducing Bikaner rams and by evolving a cross-breed by crossing the Bellary ewes with Bikaner rams. The possibilities of starting a sheep-breeding society in a suitable place and of a sheep-breeding station in the Bellary district are being examined. For introducing improved methods of weaving, etc., a weaving demonstration centre is being started in Bellary district to train the Kurubas in weaving on fly-shuttle looms.

(*d*) *Ericulture*.—This is not done at present in these districts. But considering that more than half the total acreage under castor in the whole province is accounted for by these districts, there seems to be some scope for the development of the industry as a subsidiary occupation for the agriculturists. The conditions in these districts are also said to be favourable for the propagation of eri worms. However the spinning of eri silk is a slow and tedious process needing patience and as the handspun silk yarn is irregular, the demand for it is very restricted. The only alternative is therefore to find a ready and remunerative market for the cocoons themselves. The possibility or eri silk being used by the waste silk spinning plants is being examined.

(*e*) *Handmade paper manufacture*.—Large quantities of raw materials such as botha grass, jammu grass, aloe fibre, marul fibre and paddy straw which are found to be suitable for the manufacture of paper, are available in parts of these districts. Handmade paper is even now being made in a few places in Anantapur district. The further development of the industry may provide part-time occupation for the agriculturists. Handmade paper may not be able to compete, in peace time, with mill-made paper either in quality or in price, but ordinary paper as also wrapper paper, can be made for local consumption. A demonstration party has been working for the last two years in the Cuddapah and Anantapur districts. A demonstration handmade paper factory has also been organized in Kurnool district, whilst the organization of another such factory in Cuddapah is in progress.

(*f*) *Malt-making.*—Experiments conducted by the Agricultural department revealed that good malt could be made from cholam on an industrial scale. As there is a large acreage under cholam in the Ceded districts, the industry seems to be a promising subsidiary occupation for the agriculturists. It was proposed to encourage its development by means of demonstrating to the ryots the method of preparation of malt, but these demonstrations could not now be arranged as there was no surplus cholam in these districts. The question will be taken up as soon as the conditions improve in these districts.

General.—It would be unwise, however, to restrict the scope of the term "industries subsidiary to agriculture" to cottage industries or to those industries which give subsidiary employment to the agriculturist. It is considered that it is desirable to divide the province into "economic units", the smallest of which might be in type squares with sides 15 miles long and to plan the agricological and industrial development of each unit.

In a unit where the agriculture was mainly groundnut and cotton, the industries for development would be oilseed crushing, cotton ginning, handloom or power spinning and weaving.

In a unit which had special possibilities for dairying, a central dairy with a co-operative milk society should be established.

For a number of oilseed units, a vegetable ghee hydrogenation plant might be established and for a number of dairying units a dried milk factory. It is desirable that there should be balance of agriculture and industry not only for the country as a whole but for each area in it.

7. *North-West Frontier Province.*—The Government have stated as follows: "Small study so far has been undertaken of village industries in this province and accurate and exact information is not available. The ordinary village industries subsidiary to agriculture are the following:—

Weaving, making ropes and mats from mazri (dwarf palm), various kinds of basket-making from palm leaves, manufacture of sajji (soda) from the khar shrub (haloxylon recurvum) in the southern districts, the making of painted ornamental boxes, etc., from tamarik wood in various parts of D.I. Khan district, vegetable oil industry, construction of wells, making and repairing of agricultural implements by village blacksmiths (lohars), manufacture of wool blankets and cloth in the Kangra Valley, Hazara district, and Swat State, and on a small scale sericulture and bee-keeping in Hazara district. The local Government has already taken steps to investigate the possibilities of a starch industry using potatoes and wheat as a base, a paper industry from tap and kahi and other grasses, a lac industry based on ber trees in Peshawar and Hazara districts, making of bone-meal and lime-blood manures, and button making from bones.

The principal industry, however, which has come into being during the war is the dehydration of fruit. This industry is centered in Peshawar district, where most of the dehydrating factories are situated. There are at present 29 dehydrating centres in Peshawar district, 6 in Mardan, 5 in Hazara, 1 in Bannu and 1 at Miranshah in the North Waziristan agency. The last two factories are probably to be discontinued, as the fruit is used for the canning factory near Tarnab in Peshawar Tahsil, the construction of which was completed in September 1944. The development of the dry fruit and fruit-canning industries in this province is probably the most promising measure for providing a supplementary income and a livelihood for those employed in agriculture. Many thousands of persons are already directly or indirectly engaged in these two industries and much of this labour is at present drawn from tribal territory and outside the province. After the war, this outside labour should be replaceable from within the settled districts of the province. The development of the sugar industry also by the construction of other sugar factories similar to that at Takhtbhai should go a long way towards enriching the agriculturists of the northern districts of the province."

8. *Orissa.*—The development of small-scale industries in the rural areas, subsidiary to agriculture, has not proceeded on organized lines. However, with the natural resources and the traditional skill which the Oriyas have imbibed from ancient times, small-scale industries like handloom weaving, pottery, basket-making from cane and bamboos, rope-making, mat-making,

salt manufacture and bell-metal industries have been sustained and developed in different centres of the province partly through the efforts of the Provincial Government and partly through private enterprise.

Industries directly connected with agriculture such as smithy, carpentry, processing of agricultural products such as dehusking of paddy, crushing of oilseeds, etc., and cattle breeding and dairying have also been pursued more or less in the villages as supplementary vocations to agriculture.

In the districts of Ganjam and Sambalpur, the handloom industry is fairly well established specially among cultivators of the Scheduled Classes. Poultry keeping is similarly popular among these people. Dehusking of paddy specially by the women-folk of the poorer agriculturist families provides a very good supplement to the income from the land. In Balasore district, bell-metal manufacture, stoneware manufacture and basket-making industries are noteworthy. In the Banki area of the Cuttack district, manufacture of solid and refined *gur* by the cultivators themselves has been very popular during the last five years. Cattle breeding and goat and sheep rearing is commonly practised by the agriculturists in every part of the province not only to meet their own requirements but also for sale in the market. Ericulture has not developed to any appreciable extent. Manufacture of salt in the coastal areas of Puri and Balasore districts is a spare-time occupation (it generally extends from January to May) providing a good income to the agriculturists.

The Industries department of Government have a well-organized textile section which not only carries on demonstration and propaganda in improved methods of weaving, dyeing and designing but also supplies yarn to the weavers in the rural areas and undertakes the sale of the finished products through the Textile Marketing Organization. Under the State-Aid to Industries Act, the Government give financial grants to some institutions which undertake the training of candidates in small industries. The All-India Village Industries Institute and the All-India Spinners' Association have also done a good deal to popularise handspinning and weaving in the rural areas. These measures have, however, touched only the fringe of the problem. Although in many parts of the province these industries provide some supplemental income to small cultivators, there still remains much to be done. A planned industrial development scheme covering the whole field can only be drawn up after a thorough survey of the existing industries is made. Although such a scheme would involve large scale expenditure, any money expended will be amply repaid. Provision of cheap power will help immensely in developing these small industries which the cultivators can take up during their spare time.

Since most of these industries are in existence only on a small scale, they are not calculated to reduce the number of underfed persons appreciably but wide scale development of these industries on organized lines would help to reduce the number to some extent.

9. *Punjab.*—The industries subsidiary to agriculture in this province are as follows:—(1) Dairy farming. (2) Cattle and sheep-breeding. (3) Poultry farming. (4) Fruit and vegetable preservation. (5) Bee-keeping. (6) Wool spinning. (7) Lac culture. (8) Sericulture.

(1) *Dairy farming* is the common subsidiary industry which is followed by almost every farmer. Some farmers may keep only one or two animals to meet their domestic needs of milk and its products, and for sale of ghee, while in the cattle-breeding tracts the number of milch animals may go up to a dozen or more. Unfortunately there are far too many inferior animals and milk yields are low. Finding that no special attention was paid or no special effort was being made by the farmers to evolve and preserve good breeds of milch animals, Government made a grant of a little over 3,000 acres for buffalo breeding and 2 grants of 4,226 and 3,800 acres for Sahiwal breed of cows. In addition to the above, small grants of about 50 acres each have been made to peasant cultivators for maintaining and breeding Sahiwal cows. Another grant of nearly 485 acres was made by Government for a dairy farm.

A small dairy herd is maintained at the Lyallpur Agricultural College for purposes of teaching and research. It was started in 1914 with cows purchased from the villages and the average over-all yield of milk was

then 5·6 pounds. By systematic feeding and breeding, the average overall yield is now between 17 and 18 pounds and at one time it reached 19 pounds. A few buffaloes were also added in this herd some years later and here too, there has been an increase in the yield of milk.

A course of one year's training is held every year at the Lyallpur College for people who want to study dairying. A two months' training is being given to the men sent by the Army in batches.

(2) *Cattle breeding.*—Barani[1] areas in the north and south-east Punjab and a small portion in the south-west are eminently suited for the breeding of draught cattle on, more or less, an economic basis, as large areas are available for grazing, and rearing of cattle is not costly. For the improvement of draught cattle there is a big cattle breeding farm comprising an area of about 65 square miles at Hissar. Due to systematic continuous work, cattle breeding has achieved remarkable results. Every year a large number of bulls is issued at concession rates which in fact is about 25 per cent of the cost of rearing a bull. Besides this, Government has granted a total area of 1,011 acres for the maintenance of a herd of 3 Hissar bulls and 125 Hissar cows for the purposes of breeding the well-known Hissar breed of draught bulls. Numerous other small measures such as grant of stipends, prizes at shows and fairs, registration of cows, purchase of young stock from the zamindars for rearing at the Government farms, castration of scrub bulls, etc., have been taken by Government for encouraging the breed of good type of draught bulls.

Sheep-breeding.—One hundred and fifty sheep breeding units, each consisting of 50 ewes and one ram of the improved types, have been distributed to *bona fide* breeders of the Province on a system by which a proportion of the young becomes the property of the breeders. A flock of improved variety of sheep is also being maintained at the Government Cattle Farm, Hissar, for purposes of breeding and research work. Improved types of ewes and rams are issued from this flock to *bona fide* breeders at concession rates.

(3) *Poultry-farming.*—Poultry-farming has not so far been taken up by the people on a commercial scale. In the south-east as well as in the Kangra and Hoshiarpur districts, there is a religious prejudice against poultry keeping and elsewhere also it is apt to be left to menials and small tenants who keep fowls in a haphazard manner and pay little or no attention to feeding and protecting them. Round about the towns, specially near the cantonment areas, a good number of the rural people supplement their income by keeping fowls and the practice is slowly spreading. The war has stimulated trade in the sale of eggs and fowls. Government has established six experimental farms at Gurdaspur, Jullundur, Lyallpur, Montgomery, Multan and Rawalpindi. Quite recently, a big poultry scheme in conjunction with the Army authorities has been started at Gurdaspur where an electrically worked incubator with two brooders has been put up since 26th October 1944. On the termination of the war, the plant will be taken over by the Punjab Government on agreed terms.

(4) *Wool-spinning.*—This is practised by the womenfolk of several districts in the Province, but in the Kangra and Simla districts and in the Thal it is practised by men also. During this war, the demand for Army blankets has been enormous and several factories for making blankets have come to be established at Amritsar, Panipat, Tarn Taran, Khemkaran, Jhang and Dera Baba Nanak where spinning of wool was generally done by the womenfolk and weaving was done in the factories. It remains to be seen whether the practice can survive the war.

(5) *Fruit and vegetable preservation.*—With a view to encourage fruit industry in the Province a Fruit Section was established at Lyallpur in 1925, which is responsible for education, research, demonstration and propaganda. A good deal of research work in fruit culture is in progress not only at Lyallpur but also in other places such as Attari in the Amritsar district and Palampur in the Kangra district. Nurseries at different centres scattered all over the Province have been started for improved varieties of different fruit plants which do well on the Punjab soils. A progeny garden of 25 acres has been started near Lyallpur mainly for the supply of budwood from fruit trees of outstanding merit. Fruit Growers' Associations have

[1] Unirrigated.

been in existence since 1935. Increased water-supplies from the canals have been permitted for fruit gardens. These and several other steps have resulted in a large increase in the area under gardens.

The Agricultural Department has installed at Lyallpur equipment to enable it to preserve fruit on a semi-commercial basis with the object of ascertaining the economics of fruit preservation, as well as of testing the local market for products locally prepared. Several garden owners have put up their own plants for preparation of juices, squashes, jams, etc. This industry is promising and has already received a fillip during the war.

(6) *Sericulture.*—Before 1939–40 silk seed used to be imported from France and Italy for distribution amongst the rearers. The production of disease-free seed on scientific lines was undertaken at Palampur towards the close of the year 1939–40. A beginning was made with 17 ounces of silk worm eggs of thirteen different races which were reared at Sujanpur and Madhopur partly by the department and partly by the selected rearers who were supplied rearing appliances and silk seed free of cost. The experiments gave satisfactory results and the production of seed at the Palampur grainage and rearing by private and departmental rearers has continued on a larger scale every year to meet the increasing demand. Silk rearing which used to be confined to a few hundred rearers in the four districts of Gurdaspur, Hoshiarpur, Kangra and Rawalpindi has now become popular in 16 districts of the Province. To meet the growing demand for silk seed, a second grainage was established at Dalhousie in 1942–43. The sub-joined table shows the quantity of seed produced, number of rearers and the number of villages where rearing has been carried on during the last three years:—

Year.	Quantity of seed produced.	Number of rearers.	Number of villages.
1941–42	1,554 ounces.	1,042	365
1942–43	1,959 „	1,297	354
1943–44	2,313 „	1,941	469

Proposals to open a third grainage in the Province are under the consideration of Government at the moment.

Reeling.—The Government Demonstration Filature and Silk Throwing Factory, Amritsar, was set up in 1938–39 with a view to introduce up-to-date methods of reeling, twisting and warping of silk. Besides arranging demonstrations in these processes the factory works as a commercial undertaking. A number of persons have been trained in the art of reeling. The factory has shown very good commercial results during the last three years as is borne out by the following figures:—

Year.	Quantity of silk produced by the factory.			Net profit.		
	Md.	Sr.	Ch.	Rs.	A.	P.
1941–42	12	29	5	9,682	14	6
1942–43	14	23	10	16,550	2	3
1943–44	12	5	10	25,032	2	8

The Government Reeling Party has been giving demonstrations in the villages of the Province as a result of which 150 domestic reeling plants have been fitted up in rural areas, and a large number of rearers who previously used to sell their crop of cocoons, now reel it themselves and find it remunerative.

Mulberry plantations.—Mulberry is the backbone of sericulture and Government has made special efforts to set up nurseries for providing mulberry plants to cultivators in silk-rearing areas. Arrangements are also made for the supply of leaves to silk rearers from the mulberry trees growing on the roadsides under the charge of Public Works Department and local bodies. A model farm covering an area of 9 acres has been acquired at Amritsar from the Irrigation Department where 60,000 cuttings of suitable varieties have been planted. It is expected that nearly 100,000 plants will be ready for transplantation from the nurseries of the department during the next rearing season. This industry has a great future and the cultivators stand to gain by taking to it.

(7) *Lac culture.*—Lac culture has not made any appreciable progress in this povince on account of the preparation of synthetic lac in foreign countries and also on account of the insect enemy that destroys the lac insect. Some research work is being done to control this insect and if successful, cultivators may be able to take to lac culture again.

Besides the above subsidiary industries, basket-making, rope making, mat-making are other cottage industries which help to supplement the income of the agricultural labourer ordinarily dependent on agriculture.

10. *Sind.*—The industries strictly subsidiary to agriculture in this Province are cotton-ginning, rice-husking, wheat-milling, cotton seed oil extraction, gur-making, ghee-making, agricultural implement making, etc. Such industries have been left generally to themselves and the only encouragement has been the ordinary demand for their products. Government has done nothing worth drawing attention to, by way of example, in the way of developing these industries, or cottage industries less directly subsidiary to agriculture in the 20 years prior to 1941–42.

In the cultivated areas of Sind no one at present need be out of a job as agriculture itself in most areas creates a larger demand than the supply can satisfy. For the desert areas and one-crop areas the best outlet for spare energy would appear to be agricultural implement making, ghee-heating, wool production and poultry.

As far as these matters can be forwarded by the Agricultural Department there is hope of some success but Government could mention, in case the point is of general application, that the lack of an Industries Department of adequate calibre is a heavy handicap.

11. *United Povinces.*—The following are the industries subsidiary to agriculture in the United Provinces. They are termed as cottage industries:

(i) *Textiles.*—(*a*) Weaving of cotton, silk and woollen fabrics, (*b*) Duries weaving, (*c*) Carpet weaving, (*d*) Hosiery, (*e*) Dyeing and printing.
(ii) Leather, including flaying and curing of hides.
(iii) Oil pressing.
(iv) Ghee making.
(v) Glass.
(vi) Basket making.
(vii) Hand made paper.
(viii) Gur industry.
(ix) Poultry and eggs.
(x) Bee-keeping.
(xi) Horticulture.
(xii) Fruit preservation and canning.
(xiii) Rope and *ban* making.

Full industrial surveys of the industries in the Provinces took place in 1922–24.

It was observed that the cottage industries were rapidly declining. Efforts were made to improve the technique of the artisans by providing them with permanent schools which aimed at training cottage workers in improved methods and helping them in the improvement of their technique, demonstration parties were sent out to explain to artisans at their homes, new devices and methods of using improved appliances. No fee was charged. Co-operative experiments for helping cottage workers were made. The societies were formed to arrange for the supply of raw materials to members on credit, or cash payments, and for selling the manufactured goods either on commission or after purchasing these from the members. The position was revived later on and it was felt that the attempts made so far had not been sufficient to achieve the desired objects and that the cottage workers stood in need of help and guidance as regards both production and marketing. Subsequently schemes for development of certain industries, viz., wool, handloom, leather, raw hides, gur and several industries concerning the rural areas were launched. These schemes were designed to assist the workers from the beginning to the finish. The department secured raw material. The manufacture was carried on under its supervision. The finished goods were also marketed by the department. The workers were subsidized. The progress of some of these schemes retarded recently during the war. Steps have been taken and proposals are afoot to expand and concentrate their working. Exact figures to assess the results of such efforts from the point of view of provision of supplemental income to small cultivators and reduction of the number of sections of the population too poor to secure sufficiency of foodgrains, are not available. The fact, however, remains that most of

the labour from the agriculturist class have got employment in connexion with the war supply schemes. At present about 20,000 workers are engaged on lock and blanket supplies for war purposes. In connexion with the wool scheme operating in the hills, 3,000 workers are engaged. The recommendations in the case are that the scheme for development of industries designed to assist the workers be expanded in such a way as to enable each worker to derive benefit from them. Proposals on these lines are being made in connexion with the Post-war Reconstruction Scheme. Proposals for the expansion of Rural Industries Scheme are already under consideration of Government and embrace concentrated work in 12 districts in 1945-46 on these lines.

B.—Abstract of replies to question (2)

1. *Assam.*—The Provincial Government have stated as follows: "The persons normally unable to secure work in Assam have been so small that the question (of the extension of the principle underlying famine relief measures even in normal times) has not been considered by this Government. Even the temporary measures necessary to meet famine in other provinces have not been required in Assam. In the absence of experience of working the famine system and as they have insufficient time to consider the practical aspects of the question, this Government would propose not to express a definite opinion."

A Deputy Commissioner says: "This involves very wide principles of social security. Opinion is generally unanimous that there should be pensions for the aged and for cripples. But it is not considered that rural conditions are ripe for employment insurance for agricultural workers, especially as the problem is not so much one of unemployment as partial employment. At sowing and harvest seasons there is work for all willing to do it and it is the remainder of the year when many willing to work have to sit idle."

A subdivisional officer says: "It is desirable that Government should undertake even in normal times the obligation to provide food or purchasing power to all persons who are unable to secure food and who if, able-bodied, are willing to work. Such scheme of relief may be organized through various departments of the Government."

Another officer does not "agree that the principle underlying famine relief should be extended to normal times. It should be the obligation of Government to provide work for the people to earn at least a rupee per day."

Yet another Deputy Commissioner is of the opinion that "the right to live and work is an elementary right of the citizen in a civilized State which should be recognized by Government and measures taken. Public works like road making, irrigation projects, reclamation of marshes and jungles, clearing of tanks and waterways, and organized cottage industries under Government control are a few suitable types of works. A separate agency should be set up like the Civil Pioneers or 'Labour Front' minus the uniform, parades, and militarism, which will organize and supply to Public Works Department and other departments. The probable cost should not exceed eight annas per head with a normal price level."

A Sub-Deputy Collector holds that "there should be a separate department for enforcing a Famine Insurance Scheme. Every year, some works should be found, say, from Public Utility works like new roads and canals and repairing them, or even levelling, for avoiding uneven distribution of rain water in agricultural lands. The average cost of such relief will be As. 8 per head per day."

2. *Bihar.*—The views of the Provincial Government are as follows: "The suggestion that even in normal times Government should undertake the obligation to provide food or purchasing power to all persons who are unable to secure food and who, if able-bodied, are willing to work, is one to which no exception can or ought to be taken, except on the score of finance and the danger of producing a class that will do the minimum of work and demand the maximum of wages or food. But the State cannot fulfil the obligation unless there is a constantly-expanding scheme of public works or it has complete control of production and distribution.

But the question that arises in this connexion is whether there is any need for such State intervention at present. The answer is clear so far as destitutes are concerned. Destitutes may be classified under the following three heads:—

(*a*) *Destitutes who are incapable, by reason of disease, deformity or old age, or other reasons, of doing work.*—These should be maintained by the State, and not be allowed, as at present, to drag on their miserable existence on wayward and fortuitous private charity.

(*b*) *Destitutes who are able-bodied but unwilling to work, i.e., beggars in the real sense.*—These must be made to work, and the State should undertake the obligation to find work for them. If work cannot be found for them, they will have to be supported out of public funds, but it would be folly to do so when there is so much useful work waiting to be done in this country. Begging should be made a crime but not until the State is able to find work for the beggars. Legislation on the lines of the Poor Laws in England seems necessary.

(*c*) *Able-bodied destitutes who are willing to work but are unable to find employment.*—The State should as far as possible find work for these also and not leave them dependent on private charity.

For the other able-bodied persons who are not destitutes but who suffer from periodic unemployment and are willing to work, the question is not one of relief but of increasing the economic efficiency and income of the people by providing opportunities of employment in productive occupations and by increasing production itself, both industrial and agricultural, in other words, of increasing the divisible wealth and getting an equitable distribution."

An officer of the Bihar Government states as follows: "I think it is the duty of every civilized State to see that none of its citizens dies of starvation, and it must undertake the responsibility of maintaining persons who cannot either support themselves or be supported by their relatives. Those whose incapacity arises from physical defects must be separated from those who are able and willing to work but cannot find work. The defectives, unless supported by their families, must be supported and medically treated, where necessary, by the State. It is a duty which has long been neglected by the State in India. We must, however, proceed very cautiously with the able-bodied unemployed. A scheme of compulsory contributory insurance against unemployment is perhaps not altogether impracticable, in spite of its difficulties, in the industrial field; but agriculture presents a different problem. Maintaining able-bodied workers in idleness at State cost is a dangerous policy even in periods of agricultural inactivity. Unemployed agricultural labourers should be encouraged to move to urban and industrial areas to find unskilled jobs; but for those who cannot or will not move, Government might establish in rural areas simple cottage industries suited to the circumstances of the locality, which would offer employment to such people. It is possible that such industries will have to be run at a loss; and if this is so, it should be financed by an amplified agricultural income-tax."

A non-official view from Bihar is as follows: "The duty of modern Government is much more than simply maintaining law and order and I am decidedly of the opinion that it is the duty of the Government to see that not a single individual dies of starvation. Sufficient quantity of food should be available to everyone, whether there is famine or not. In other words, it is the duty of Government to see that every able-bodied man who can work should have work and his wages should be such as to enable him to maintain himself and those members of his family who are unable to work . . . Work can be provided by a number of ways, e.g. (1) by establishing or encouraging or arranging the establishment of industries, (2) making arrangements for expansion of cultivation which will employ larger number of labourers than they are being employed now . . . The construction of irrigation works and drainage of the water-logged areas are the two important works which can be carried on by Government, and not by private individuals . . . It is difficult to estimate the average cost per head per day. It will depend upon the price of the foodstuff at a particular time in a particular locality. The wages should be sufficient to give the workers food sufficient to maintain himself and his dependents who are unable to work."

Another non-official is of the opinion that "it is not a question of relief but of increasing the economic efficiency and income of the people. The State under the existing system and its present resources cannot undertake to provide food or purchasing power to all persons who are unable to secure food and who, if able-bodied, are willing to work. The State has to provide full employment and unemployment insurance and also insurance against other risks like sickness, invalidity and death. But this cannot be done if the task is conceived as a question of relief. The undertaking of these obligations would involve thorough economic reconstruction."

3. *Bengal.*—The Government's views are as follows: "It is recognized that Government's obligation relates to the saving of life by giving such relief in times of scarcity and distress to those people who are incapable of procuring their livelihood on account of physical infirmities or utter helplessness and also to provide work in the shape of Test Relief Works for able-bodied persons who may not get employment elsewhere. It is most undesirable, however, that ordinary measures of famine relief should be a permanent feature of any administration and that Government should undertake even in normal times the obligation to provide food or purchasing power to all persons who are unable to secure work and who, if able-bodied, are able to work. The Government of Bengal have already initiated through the subsidized enforcement of the Bengal Rural and Unemployed Relief Act (1939) a policy of fostering the growth of a regional sense of responsibility under which the village self-governing bodies would, with some initial aid from the State, look after their own poor and unemployed. Government would thus encourage the village self-governing bodies to gradually establish poor houses and work-houses in their respective areas on the lines of such institutions in the advanced countries of Europe.

"The existence of under-feeding and unemployment even in normal times is only a symptom indicating that there is something definitely wrong with the general economy of the province and that while recognizing the necessity for rendering prompt and adequate assistance to those who fall by the wayside, the Government of Bengal propose to devote their energies to making and implementing effective plans directed towards removing the root causes of these symptoms by increasing the productivity of the land and utilizing the man-power and hours now wasted during certain parts of the year by promoting cottage industries and finding profitable subsidiary occupation for the agriculturist population."

A Divisional Commissioner of Bengal is of the opinion that "no Government could stand the strain of this and it would be impossible to meet the demands in a few years, as the birth rate would make such a collosal increase. Generally those people who live on the margin can get some local charity or some odd jobs in normal times that can enable them to carry on. It is possible that the experience of the famine has had the effect of drying up the traditional charity of the people: but this should not be anticipated."

A non-official view is as follows: "I do not agree that Government should undertake to provide food or the purchasing power to anyone in normal times. But I do feel that it is essential that there should be balanced economic development of Industry, Commerce, and Agriculture to provide opportunities for creative work, to earn more money to purchase the food, and backed by education for better use of the food purchased or in other words training them in scientific living. If more amenities for productive work could be provided, better ideas of scientific living taught by demonstration and propaganda, a definite improvement is possible."

4. *Bombay.*—The Provincial Government's views are: "Government cannot undertake to provide work for all in normal times. Generally there is no dearth of manual work for those who want to take it up. People are however not readily willing to leave their villages and go out on work elsewhere unless forced to do by circumstances, and it is impossible to provide work for them in every village. Nothing short of a plan similar to the Soviet plan, giving Government power not only to plan production but to enforce it by control over land, labour and capital, can achieve the desired results. This would mean Government control over all factors of production and loss of individual liberty, but Government cannot undertake to feed the population unless it has powers to compel people to work and produce the food required according to the plan."

5. *Central Provinces and Berar.*—The Government have replied that "there is no justification at present for extending the principle underlying famine relief, in the manner suggested. It is not necessary for Government to intervene unless scarcity conditions appear and distress is fairly acute. At present there is work for all who are willing to work."

6. *Madras.*—The Board of Revenue, Madras, after referring to the liberalization of the principles underlying famine relief, which took place as a result of the recommendations of the Madras Famine Code Revision Committee of 1938, state as follows: "As a statement of general principle, the suggestion cannot be accepted having regard to the conditions of the province which is predominantly agricultural, and industrialized only in a very small measure." The Board go on to say that "unemployment of whatever section of society is a complex evil arising from many causes . . . That the State should undertake to provide food or employment for all persons in normal times may be justifiable on humanitarian but not on practical grounds: such an obligation could be enforced only in a strictly regimented country under a totalitarian regime. In a democratic country, where individual initiative is interfered with as little as possible, it would be impossible for Government to undertake to provide food and employment for all the needy and unemployed." Apart from the fact that the province has few sources of revenue left untapped in order to meet the collossal expenditure involved in the suggestion, the Board take the view that "the solution for unemployment is not to organize State relief and thus perpetuate conditions which give rise to unemployment and incidentally demoralize the receiver of the State aid . . . On the other hand, it is necessary to go to the root of the problem and provide the necessary facilities for able-bodied men to secure employment . . . To sum up, it would not be desirable to extend State relief to persons out of employment and willing to work and Government can only undertake the duty of creating such avenues of employment as are possible by industrialization, improvement of agriculture, etc. In fact, this question . . . should be dealt with on an All-India basis as part of the plans for post-war reconstruction."

A non-official social worker from Madras, referring to the change effected by the Madras Famine Code Revision Committee (1938), says: "The revised draft extends the scope of intervention not only to protect those affected from starvation but also to protect them against physical deterioration and dispiritedness which, in the words of the Government Order 'is intended to reflect more recent ideas of the obligations of the State towards its citizens.' So the objectives of famine relief are now sufficiently wide and a permanent organization similar to that set up in Great Britain to meet unemployment may be considered. "In famine relief organization, generally road works are preferred owing to various advantages especially in regard to administration. The Famine Code does not rule out undertaking works of public utility. Even starting of large-scale industries to provide employment for the unemployed in agriculture may be thought of. However, it is desirable and necessary that a special expert committee may go into details of forms of relief applying the principles of famine relief for application even in ordinary times. As already stated, knowledge of intimate working of unemployment schemes in Great Britain (an industrial country) and agricultural countries like Australia and New Zealand will be helpful in framing a scheme for India."

7. *North-West Frontier Province.*—The Government have replied as follows: "It is presumed that the principle enunciated is an extension of the out of work relief system adopted in England with the further axiom that out of work relief would only be provided to those who are prepared to do whatever work Government provides for them. This would seem to be a revolutionary (or possibly evolutionary) innovation, which in Russia and Germany was imposed by Government forcibly. Similar measures were adopted in New Zealand from 1927 onwards and met with some measure of success. . . . The Provincial Government feel that the proposed measures would be so much in advance of anything so far proposed for the betterment of this province that their early introduction could not be adjusted to the social structure of the province. There are of course plenty of works in the nature of constructing bunds, reservoirs, water-channels, drains, maintenance of roads, etc., on which unskilled labour can at any moment be employed—if there are funds available."

8. *Orissa.*—The views of the Provincial Government are: "With society and the system of public administration as at present organized, it is both undesirable and impracticable for the State to undertake a scheme of universal social insurance involving an undertaking on the part of the Government to provide subsistence at all times to all persons who are unable to earn their livelihood in the course of the normal economic activities of the society. Such an undertaking by the State might lead to indolence and demoralisation of the population and discourage the spirit of free enterprise, thrift, self-help and the spirit of competition among the people. There may, however, be occasions when the State may be compelled to undertake such responsibility wholly or partially in circumstances arising from various causes, e.g., natural calamities and serious economic distraction caused by upheavals."

9. *Punjab.*—The Government's reply is as follows: "This suggestion presupposes that the Provincial Government possesses or controls all the means of production and transport or that it commands an unlimited finance which is not at all the case. The sources of provincial revenues are circumscribed and the income is mainly drawn from the rural population. In a famine-stricken area, suspensions and remissions of land revenue have to be made on a very large scale and consequently, there is a decrease in the revenues of the Province. On the other hand, relief measures mean additional expenditure with the result that unbearable strain is thrown on the finances of the province and beneficent and developmental activities of the Government have to be reduced. There being not much demand for industrial labour, the workless and foodless cultivators become surplus on the land and further depress the wage rate of agricultural labour with the inevitable result that the purchasing power is further reduced.

"Apart from finance, the country is not yet ready for any general system of relief in normal times which might reduce the incentive to work. There are already far too many professional beggars."

10. *Sind.*—"Government is of the view that the time is not ripe to assume responsibility for individual distribution of the necessities of life in normal times though as an eventual aim there is no objection to the principle. What seems important to Government is to recognise a famine when it is developing and to take measures in time. Government has little faith in doles or in putting men fed on a 'relief' diet to work on famine projects which require physical fitness. It is believed that the only real remedy lies in improving agricultural production and science in such a way as to make it yield at least a bare living even in the worst season, and much of the Sind Government's agricultural planning is directed to this end. For example, for the Thar desert where the ordinary *pis-aller*, the emergency building of small reservoirs to provide work more than insurance, has not been adequate, dry-farming is being developed, the growth of fodder-producing trees and grasses is being examined and the conservation of rainfall is being studied."

11. *The United Provinces.*—"The United Provinces Government do not agree with this view (underlying the question) since they consider it will lead to pauperization."

APPENDIX VI

RURAL DEVELOPMENT ORGANIZATIONS

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RURAL DEVELOPMENT ORGANIZATIONS

Question

(i) The view has been often expressed that individual holders of land cannot achieve any material increase in production or improvement of their standard of life unless they are organized for the purpose, e.g., on some kind of collective basis. Do you agree with this view?

(ii) Describe the extent to which co-operative societies, panchayats, or other organizations are at present functioning in rural areas of your province. Assess their adequacy or usefulness for the purpose stated above.

(iii) If you consider them inadequate or inefficient, can you outline practical methods of constituting some form of village organization which would efficiently secure the purpose in view?

Abstract of replies

Part (i) of the question

1. *Assam.*—Collectivization will certainly increase production. As long as rights of property in land remain as they are, any such scheme can only be on a co-operative basis.

2. *Bihar.*—The view put forward in the first part of the question has much to support. In fact, areas where subdivision and/or fragmentation of holdings has gone very far, collective or co-operative farming offers the only hope of adopting improved methods of cultivation. Joint organization will facilitate introduction of power farming and release surplus labour from the fields to find lucrative employment elsewhere. Collective purchase of seeds, manures and implements, and collective sales of the produce should, by the elimination of the middlemen's profits, also contribute to an increase in the ryot's share of the income. Habits engendered by organized or collective action in the village should prove fruitful in other directions in securing education, health, sanitary and other services and amenities in the village.

3. *Bengal.*—" We agree with the view set out in this question. It is only an increase in the income of the individual holder of land that can bring about an improvement in the standard of life. This increase can be effected by increased production and by giving him the maximum possible financial returns for his produce and also by providing him with some subsidiary occupation during the off season. Increase in production can be achieved by (i) the use of improved seeds, (ii) the use of scientific manures and fertilizers, (iii) the use of improved agricultural implements, (iv) providing irrigation or drainage facilities where necessary, (v) providing embankments for protection of lands where necessary, (vi) consolidation of the existing small and scattered holdings. (iv) and (v) are almost always possible through joint efforts. (vi) would invariably call for combined efforts. (i), (ii) and (iii) can be made available at a reasonable cost only by joint purchase. An ordinary holder of land does not get an adequate return for his produce. He is often compelled to dispose of his crop immediately after harvest at a low price to meet his immediate pressing needs. He has no holding capacity and commands only the harvest price. This drawback can be removed and a better price can be ensured to him by a marketing organization through which he can sell and market his produce and which will make an advance to him against the crop delivered to help him in meeting his present requirements. Some sort of cottage industry may be introduced in the family of an agriculturist to keep the adults engaged during the off season and also afford a share to the womenfolk to contribute to the joint income. The raw materials can be provided at an advantageous price through collective purchase. Similarly, the finished products can be sold at an advantageous price in a suitable market through joint sale."

4. *Bombay.*—Government agrees with the view expressed in the question.

5. *Central Provinces and Berar.*—The potentiality of an organization of cultivators for increasing the productivity of their lands is admitted. Collective farming enables a cultivator to have lands, implements and other agricultural requisites to the extent to which they are required for cultivation purposes and affords an opportunity to utilize them fully. This secures a number of economies which are denied to individual cultivators.

6. *Madras.*—"It has been mentioned in reply to the earlier questions that holdings are probably becoming smaller, that the number of people owning uneconomic holdings is probably increasing that fragmentation is on the increase and measures for consolidation had borne no fruitful results, that lands tended to pass to non-cultivating classes during the slump period which tendency is believed to have been arrested at present owing to high prices, and that the landless proletariat is probably increasing in numbers leading to competition for tenancy. The system of leasing in force does not induce either the owner or the cultivating tenant to invest money to improve the land or even on the much-needed operation of manuring, and they seem to be content with sharing just what the land yields from an indifferent cultivation. There is an increasing tendency to disintegration everywhere. The village as a compact and self-contained economic unit has ceased to be. The joint family system has almost collapsed leading to increase in fragmentation, subdivision, and absentee landlordism. . . . Though previous trials and opinions of those who have studied the question are not favourable, the only remedy seems to lie in the formation of co-operative farming societies in villages for the purpose of bringing the benefits of large scale cultivation to the innumerable small holdings."

7. *North-West Frontier Province.*—The villages in this province are organized in village communities forming a complete brotherhood in themselves. Each village represents a collective farm. The Provincial Government do not consider that any improvement would be secured at present by attempting to super-impose on the existing village communities a form of constitution or organization proposed in the question.

8. *Orissa.*—While there appears no justification to subscribe to the view that individual holders of land cannot achieve any material increase in production, there is no doubt that co-operative efforts help in securing improvement in the economic and agricultural life of the cultivating classes. Co-operative marketing, collective cultivation, consolidation of holdings and several other measures calculated to improve the cultivating and living conditions of the people cannot be undertaken except through co-operative efforts.

9. *Punjab.*—"The Punjab cultivator is individualistic. Illiteracy, ignorance and conservatism prevail. Whatever education has been made available to him so far has not tended to foster the co-operative spirit or joint-stock business spirit in him. In the rain-fed areas, the presence of moisture in the soil at the sowing time is an important factor in cultivation. The holding being small, bullock-power is the cheapest means of production available. In such circumstances, it is not possible to subscribe to the view that collective farming will result in any material increase in production or improvement in the standard of living of the cultivator, as the people who have to work it are not prepared, mentally and educationally, for it. Innumerable instances of breaking of heads can be cited where a well was jointly owned by two or more land-owners for purposes of irrigation."

10. *Sind.*—Government is prepared to subscribe in theory to the view expressed, certainly with reference to India in general, and even in a certain measure with reference to Sind. However, the background in Sind, without which no picture of this subject can be realistic, is such that there is not much scope for a really widespread co-operative movement because the land tenure system is such that there is vast scope for the improvement of agricultural conditions without the aid of co-operation.

11. *United Provinces.*—There can be no doubt that individual holders of land cannot achieve any material increase in production or improvement of their standard of life unless they are organized on some kind of collective basis, especially when fragmentation of holdings is so common in this country.

Part (ii) of question

1. *Assam.*—Co-operative societies functioning now are mainly credit societies and have not proved the success expected of them. There are no other village organizations for the purpose.

2. *Bihar.*—The co-operative societies in the province have so far mainly concerned themselves with credit activities only, and the movement touches roughly 3 per cent of the population.

3. *Bengal.*—There are 36,153 rural credit societies with a total membership of 8·68 lakhs for financing agricultural operations. In addition, there are 1,015 irrigation societies, 5 embankment societies, and 109 multi-purpose and sale societies. The Government are not definitely aware if panchayats or other organizations are functioning in rural areas. The object of the multi-purpose societies (there are 41 such societies with a total membership of 44,000) is said to be to provide facilities for better farming, better business, and better living. The society is to guide its members in the cultivation of various food and money crops, to provide facilities for irrigation and improvement of lands by consolidation of holdings, to sell and dispose of the agricultural and other produce of the members in the most profitable manner, to supply to the members the necessaries of life, and also raw materials necessary for industrial subsidiary occupation. The multi-purpose society is an effort to cater to the various needs and requirements of the agriculturists through a single agency, excepting credit which is to be dispensed by the co-operative credit society. But this credit is also to be linked with the multi-purpose society in that the loan advanced to the members by the credit society is to be collected in kind through it besides its marketing their saleable surplus. This linking of credit with the multi-purpose society has been effected at Gosaba in the district of 24-Parganas and at Parbatipur in the district of Dinajpur. The system is being gradually extended to other areas also.

4. *Bombay.*—Co-operative societies and panchayats are functioning in many villages but they are not able to do much in this direction. Co-operative societies cannot undertake the work of collectivized farming, unless they are materially helped, financially and otherwise, in carrying out the work. They would also require expert assistance in running such societies.

5. *Central Provinces and Berar.*—The Government have made no comments.

6. *Madras.*—There are co-operative organizations in the province catering to the needs of many sections of the population and for many purposes. Though all these societies are useful within their own spheres and in their own way, they have not been powerful enough to eradicate the existing defects which are responsible for the low agricultural production. In particular, co-operation has yet to make its mark in the supply of agricultural requirements, increase of production, procuring and marketing agricultural produce, or in other spheres of activity in which farmers are interested. Co-operation, however, either voluntary or compulsory, seems the method which holds the greatest promise.

7. *North-West Frontier Province.*—Panchayats have been instituted in some villages, but so far as agriculture is concerned, they are of no value. No other organizations of the kind mentioned, exist.

8. *Orissa.*—Under the local self-Government laws at present operating in different parts of the province, minor local bodies are constituted in different areas such as union committees, union boards, panchayats, sanitation committees, and so on. These institutions only deal with certain aspects of village life, namely, education, sanitation, etc. The working of these local bodies has not been very encouraging. Little can be expected from them in stimulating the welfare of the cultivating classes, even if these rural bodies are revived and multiplied in numbers. The co-operative societies, on the other hand, serve only a fraction of the rural population. These societies have so far concentrated their activities on providing cheap credit to the cultivators.

9. *Punjab.*—No co-operative society or panchayat or any other organization functioning in rural areas has made any attempt in the direction of collective farming.

10. *Sind.*—In spite of the prevalence of large estates to which co-operative methods would be hard to apply, there are enough villages in Sind consisting mainly of small holders to make it worth while pushing the movement further than has so far been attempted. The emphasis in Sind is

unfortunately almost entirely on the credit side of the movement and the results do not justify the neglect of more progressive aspects such as co-operative joint farming and co-operative marketing. There are about 1,140 agricultural credit societies with a working capital of Rs. 70·69 lakhs, and the amount outstanding on 30th June 1943, against members was Rs. 37·26 lakhs. One of the chief explanations of the disappointing state of even this aspect of co-operation in Sind is the fact that compact village sites do not exist in any number. Societies are started in small hamlets and are apt to become a benevolent fund for the benefit of the headman and his relations. *Benami* loans are a common feature, and the democratic spirit which is the essence of co-operation is almost totally absent. Some effort is now being made to amalgamate these small societies and to centralize them.

11. *United Provinces.*—Various co-operative societies are functioning in the rural areas of the province. There are 70 Central Co-operative Banks and Unions which finance the village primaries. There are about 8,000 rural credit societies which include 3,500 co-operative society village banks or multi-purpose societies. The working capital of the primaries is about Rs. 3 crores and their membership eight lakhs. The village banks are based on limited liability, and they undertake such activities as better living, better farming and better business including co-operative purchase of domestic and agricultural requirements as well as providing rural credit. Societies specially for marketing consist of 727 ghee societies, 175 marketing unions for the marketing of cereals, 90 cane-marketing societies; and there are also other societies for the marketing of special products. There are 267 societies for consolidation of holdings. There are 3,000 better living societies in the rural development villages and they have very varied activities to improve the standard of living of the villages. There are 15 cattle-breeding societies, 12 seed stores, and 160 irrigation societies. The number of villages is so large compared to the number of co-operative societies that the latter have covered only a limited field so far and touched only a few of the problems confronting the cultivators. These societies have not been able to improve production or the standard of living to an appreciable extent on account of the various social, economic and religious disabilities. But the usefulness and efficacy of co-operative methods in dealing with rural problems is beyond question.

Part (iii) of question

1. *Assam.*—The drive for the extension of the co-operative system combined with amendment of the law conferring rights over land will secure the purpose in view to some extent.

Conditions for the success of such development indicated in a reply received from one of the officers of the Assam Government are as below:—

"Reorganization of the societies; close official supervision; employment of a trained and efficient Government officer in the executive bodies of a group of societies in each Thana at the initial stage to guide, direct, regulate, and educate the societies."

Another officer (who says he spends much of his time in realizing the assets of liquidated societies) recommends the abolition of such societies and local boards and the appointment of Rural Uplift Officers "selected without regard to communal or other irrelevant factors, and well paid so as to obviate corruption."

A third officer considers that well-organized societies working in conjunction with agricultural banks are likely to be of help.

A non-official view is as follows: "Some sort of rural societies or bodies may be organized for this end in view, but they must be under strict State supervision and control. Multiplication of our present self-governing bodies will do more harm than good."

2. *Bihar.*—It is not easy to suggest a village organization for collective action. The task should be attempted seriously in one or more typical villages where conditions are considered more favourable and experience gained therein may suggest the exact form of organization likely to prove suitable. One suggestion made by the Registrar of Co-operative Societies is the formation of multi-purpose co-operative societies in the villages which will look to all sides of the cultivators' activities and requirements.

A non-official view is as follows: "A scheme for combining the preservation of individual property rights of the cultivator with co-operative farming should be devised and put into operation. Such a scheme can, I believe, be introduced by a system of rating of the intrinsic qualities of the soil and distributing the yield of the land partly on the basis of this scale of valuation . . . The other factor which will determine this distribution will be the quality and quantity of labour put in by the members of the co-operative union for the cultivation of the land. This organization will have to be supplemented by a State organization for the supply of modern instruments of production and technical skill and guidance."

An official view from this province is as follows: "Co-operative and combined organized efforts may perhaps do a little in improving the cultivation and raising the income of cultivators, specially in the sphere of the marketing of the produce. . . . Purchase of manures and seeds, construction of irrigation facilities, consolidation of holdings, co-operative dairying are among some of the other spheres in which combined action by the villagers may prove useful. But I am not inclined to be optimistic of their success in the caste-ridden, distrustful, illiterate atmosphere of the village."

3. *Bengal*:—What is now needed is organization of a network of multi-purpose societies throughout the province. An attempt is being made in this direction. In the opinion of the Government, co-operative societies are the most suitable organizations for achieving material increase in production and improvement of the standard of living of the agriculturists.

4. *Bombay*.—A suggestion has been made to Government that an experiment in collectivized agriculture on the lines of the Russian practice should be undertaken in a group of 15 to 30 villages with an area of about 30,000 acres. But public opinion is not ready for so revolutionary a change in agricultural economy and prefers that experiments may be tried in co-operative farming with a view to eliminate the middlemen, market the produce on a co-operative basis, cultivate crops according to a pre-arranged plan, and secure finance at cheap rates through co-operative agencies. Government is considering to what extent the suggestion can be implemented and has found a place for it in its post-war plan.

5. *Central Provinces and Berar*.—The small landowners are the ones who may be expected to benefit greatly by collective farming as thereby they will be able to apply greater resources to their lands. If these holders could be given preferably continuous pieces of land and provided with all the help needed for cultivation, a trial may be made of the practicability of collective farming. Careful cost accounting of these and simultaneously of individual farming may be made and cost of production compared. If this brings out great benefit for smaller cultivators, propaganda for organization may be made.

6. *Madras*.—The opinion of Messrs. Thomas and Ramakrishnan of the University of Madras, who undertook a survey of selected villages, has been quoted by the Government of Madras: "Nor is consolidation likely to be of much avail when the size of most of the holdings is far too small. A more rational though difficult line of experiment would be to organize co-operative or joint farming on a scale which would permit the use of improved implements and methods. The existing holders of fragments should be induced to merge their plots in the enterprises tentatively and, if success is assured, permanently in return for proportionate shares in the enterprise. They can work on the co-operative farm as wage-earners." The investigators have referred to an experiment in co-operative farming said to have been made in Nadia district in Bengal.[1] The Madras Government have suggested that an experiment should be made on these lines by acquiring a few villages and organizing the expropriated owners of each village into a society to cultivate the village. If this experiment is successful, it would give the data for a scheme of compulsory co-operation.

The Director of Agriculture, Madras, points out that societies for joint farming, that is, whose members carry on cultivation, pooling their lands for the purpose, have not been much of a success even in countries where co-operation has succeeded most in organizing supply, sale, etc.,

[1] This has not, however, been mentioned by the Government of Bengal in their reply.

and adds that joint farming may, however, be tried by tenants taking up land of any big temple or institution. He refers to the village panchayats several of which did quite satisfactory work in the 'twenties and were willing to impose on themselves certain levies to be spent locally and succeeded in getting local labour in lieu of money payment for accomplishing certain works. Much of this enthusiasm died away during the depression. He suggests that perhaps it can be revived after the war, if they are assured of a larger portion of the cess collected in the village. There ought to be no confusion or overlapping of the functions of panchayats and co-operative societies. The latter should be voluntary organizations for performing essentially economic functions of members, namely, getting credit, supplying agricultural and domestic requirements, selling produce. The panchayats should have powers of coercion, leaving no option to any resident in the locality to join or not to join, to pay a tax or not to pay. The services they render are of great benefit to the community as a whole rather than for individuals, and it is difficult to allocate the benefits to each resident. Co-operative societies cannot, and should not be expected to assume such powers or fulfil their functions as panchayats. This is a distinction which is not always kept in mind by reformers.

A non-official view from Madras endorses this essential distinction between the functions of co-operative societies and panchayats, the former catering to the economic needs of the ryots and the latter to the other needs of the rural areas which, directly or indirectly, affect the standard of living. "The panchayats and the co-operative societies would be complementary to each other and will together assist in the rehabilitation of the rural area." In the opinion of this non-official gentleman, the state farms and collective farms of the Russian type are neither possible nor desirable in India. "There is no need to revolutionize the agricultural economy of the country, if, with the adoption of such methods as are practicable, results can be achieved with equal, if not better, success, preserving for the peasant, scope for the exercise of his individual initiative."

7. *North-Western Frontier Province.*—The village at present represents collective farms, and the Provincial Government consider that what is required is appropriate organization of the Agriculture and Veterinary Departments of Government, so that they form a living and real part of village agriculture.

8. *Orissa.*—A network of co-operative societies should be established in the countryside. These societies should deal with not only the provision of cheap credit but also other aspects of production and sale of agricultural produce on a co-operative basis, marketing of agricultural produce, helping the cultivators in securing better breeding of cattle, improved seeds, manure, agricultural improvements, and to promote consolidation of holdings and collective cultivation. In order that they may be successful, they must be undertaken under the close supervision and guidance of Government officers for some years to come; otherwise, considering the present working of these societies in most of the areas, there is very little chance of their attaining the object intended.

9. *Punjab.*—This Government have interpreted the question as directed exclusively to the possibilities of collective farming, and being opposed to collective farming as impracticable, have made no suggestions.

10. *Sind.*—The elementary lines of development the Government have in mind are the amalgamation of small credit societies, establishment of societies or non-official agencies for the distribution of seed and agricultural implements. If the required spirit can be firmly implanted by these first lessons, the rest will follow more easily.

11. *United Provinces.*—A large scale expansion of co-operative agriculture and marketing forms part of the post-war reconstruction schemes of Government. Certain difficulties and drawbacks in the way of the societies, the removal of which will go a long way towards their betterment are stated to be (i) the rates of interest charged by the societies from the borrowers average 12 per cent; the rate should be reduced, and cheap credit should be made available to primary societies; (ii) the prevention of multiplication and subdivision of holdings is necessary; the question raises difficult problems of law and is under examination of the Agricultural Committee of the Post-war Reconstruction Board.

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