

The Determinants of a Successful Rural Industrial Cluster: The Case of the Hosiery Cluster in a Northern District of Bangladesh

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Executive Summary

It is widely recognized that rural informal industries play important roles in creating employment opportunities, promoting sustainable growth of the rural economy, and reducing the rural-urban gap and poverty in rural areas in developing countries. The importance of rural informal industries on poverty alleviation and income generation in Bangladesh is widely recognized, and further development of these industries is crucial. This is because; population of Bangladesh has been increasing rapidly over the years. As a result, labor force of the country has been increasing tremendously. To reduce poverty and to attain sustainable economic growth, it is imperative for Bangladesh to create stable income and employment opportunity for its growing labor force. Since agriculture sector in Bangladesh has already been suffering from the problems of disguised and seasonal unemployment, income and earning opportunities for the growing labor force should be created in the non-farm sector.

Note that the contribution of informal rural industries on poverty alleviation on and income generation are enormous in Bangladesh and many of the traditional rural industries are not only sustaining but also flourishing both in terms of products' quality and number of enterprises. For example, the traditional handloom industry in Bangladesh, which has not only been sustaining for hundreds of years, it has also been catering the high end urban market in Bangladesh. While the contribution of these industries in the national economy in term of employment and income generations is visible, very few studies try to understate the process of development of rural industries in developing countries like Bangladesh.

In this study, using the hosiery cluster located at Kochasohor Union of Gobindaganj Upazila of Gaibandha district as a case, it is demonstrated that the rural industrial cluster can not only provide income opportunity to the poor, but also can enhance investment on human capital by increasing school enrollment even of the children employees' in rural informal industries. Also, applying simple econometric estimation approach, an attempt has been made to identify the factors that contribute to the development of a rural industrial cluster in a developing country like Bangladesh, where agriculture is still the major source of livelihoods.

To demonstrate the role of industrial cluster and to identify the factors that contribute to the development of the cluster, we have collected primary data from the entrepreneurs, workers, machine repairers, and yarn and sweater traders. We also have collected opinion from the local elites and drop-out entrepreneurs. To collect opinion and information from the sampled entrepreneurs and other stake holders, we have used standard well-structured self-explained questionnaires. We have explained how the local tradition of socks knitting in Kochasohor has contributed to the development of a vibrant hosiery cluster. It is found that rural transportation networks especially the role of link roads and the initiation of a specialized market in Nayarhat, Kochasohor played important roles in the development of the hosiery cluster in Kochasohor.

We also have demonstrated that the initiation of a cluster is particularly important for the expansion of the industry since the cluster itself creates positive externality to the entrepreneurs through information spillover, enhancing the division and specialization of labor and by attracting a number of service providers to the cluster. Most important point

is that development of an industrial cluster in rural areas might attract large modern urban-based entrepreneurs to start production in the rural areas. In fact, it is found that a Dhaka-based 100 per cent export-oriented sweater entrepreneur has started sweater production unit in Gobindaganj because of the availability of the cheap and skilled workers in Kochasohor.

As the new land frontier is almost closed and crop intensity is already high in Bangladesh, the agricultural sector alone cannot absorb a growing labor force into productive activities. It is thus imperative to generate stable income and employment opportunities for the rural poor in the industrial sector to reduce extreme poverty in the rural areas of poverty-stricken developing countries. Based on the present study, to develop industries in the rural areas of Bangladesh we recommend that the areas where rural industrial clusters are located should be linked with the local highway, road networks. In the possible cases, gas and electricity supply should be ensured. More importantly, necessary knowledge and technology should be injected to the clusters to promote the quality upgrading process. In the process of transferring knowledge and technology, government organizations and international donor agencies such as JICA, JETRO, UNDP and UNIDO should be involved.

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Determinants of a Successful Rural Industrial Cluster: The Case of the Hosiery Cluster in a Northern District of Bangladesh

1.0 Introduction

The role of non-farm economic activities is widely recognized that rural non-farm economic activities play important roles in creating employment opportunities, promoting sustainable growth of the rural economy and in reducing the rural-urban gap and poverty in developing countries (e.g., Child and Kaneda, 1975; Islam, 1984; Ranis and Stewart, 1993; Reardon, 1997; Weijland, 1999; Hayami and Kikuchi, 2000; Lanjouw, 1999, 2001; Haggbladder, Hazell, and Brown, 1989). It is found that the around 30 percent to 40 percent of the income of the people in the rural area in developing countries comes from non-farm economic activities (Haggblade, Hazell and Reardon, 2002). Rural non-farm economic activity in developing countries thus has been considered as a major driving force of sustainable economic growth to fight against poverty (e.g., Otsuka et al., 2009).

In Bangladesh, which is predominantly an agriculture based developing country in South Asia, rural non-farm economic activities has been playing important role in creating employment and income opportunity for the rural poor (e.g., Hossain, 2004; Bakht, 1996; Islam, 1984). The statistics available from the 1981 population census and the 2005-06 Labor force Survey in Bangladesh show that the economy of the country is rapidly transforming from mainly an agro-based economy to a mixed one with the emergence of the rural non-farm economic sector providing for an increasing portion of income and employment (BBS, 1990, 2008). In Bangladesh, about 40 per cent of employed labor force in the rural area is engaged into non-farm economic sector, and the sector grew at 5 per cent per annum between the late 80s and the mid 90s and in 1995/96, and the sector contributed 36 per cent to the country's total GDP compared to about 31 per cent by agriculture (Hossain, 2002). Thus, the rural non-farm economic sector has been playing an important role in the economy of Bangladesh.

Non-farm economic activities in the rural areas very often concentrate in a small geographical area, such as in a single village or union and thus create rural industrial cluster. Industrial cluster can be defined as "concentration of a large number of entrepreneurs in a small geographical area who are producing broadly defined similar products" (Sonobe and Otsuka, 2006, p-). For example, Jamdani Saree cluster in Rupganj Narayanganj, and Tangail Saree cluster in Pathrail Union of Delduar Upazila, Tangail. These rural industrial clusters are the major providers of employment opportunity for the rural poor and these clusters exist in the economy of the country for centuries.

Despite its enormous contribution in employment creation and income generation, detailed information on the pattern and determinants of the development of rural industrial clusters in Bangladesh is still scanty (Bakht, 1996). Particularly, studies and statistics often overlook important questions as to what are the factors that contribute to the development of rural industrial clusters. Who are the entrepreneurs and who the workers in the cluster are and finally, what the problems and prospects of the rural non-

farm sector in Bangladesh are. In order to formulate effective policy aiming at facilitating further development of the rural non-farm economic sector in Bangladesh, these questions should be addressed carefully reviewing cases and primary data.

In the present study, using primary data collected from the hosiery cluster located in Gobindaganj Upazila¹ in Gaibandha district, Bangladesh as a case, an attempt has been made to identify the factors of common nature that facilitate the development of an industrial cluster in the rural areas of a developing country. Gaibandha district is located in the northern part of Bangladesh. The northern part of Bangladesh has been classified by the government as the lagging behind region due to higher prevalence of hard core poverty higher incidence of unemployment and sluggish growth rate of per capita income compared to south eastern part of Bangladesh (GOB, 2008). Thus, an analysis of the process of development of a large industrial cluster in a lagging behind rural area of Bangladesh might provide findings having important policy implications to the policy makers, academicians and donor agencies on how to facilitate industrial development in the poverty-stricken, lagging behind, rural areas of the developing countries to create employment opportunities for the rural poor. The present study specifically strives to identify the factors that facilitate the process of development of an industrial cluster in the rural area of a developing country, and explain under what condition a cluster might result in stagnancy in terms of performance relative to its growth potentials.

1.1 Objectives of the Study

This research report strives to explain the pattern of development of the hosiery cluster in Gobindaganj upazila, Gaibandha district in Bangladesh. The cluster has expanded tremendously until recently in terms of the number of entrepreneurs and employees. Recently, however, the cluster has been facing severe problems due to low demand of the main product of the cluster that is sweater. Based on the fact, we set the following objectives of the present study:

1. to quantify the contribution of the cluster in creating employment and income opportunities for the rural poor;
2. to explain the chronological development pattern of the cluster;
3. to identify the determinants that influence the development pattern of the cluster in Gobindaganj;
4. to explain the relationship between human capital of the entrepreneurs and the dynamic development pattern of the cluster in explaining the recent problem of the cluster and finally;
5. to propose a policy proposal for further development of the existing rural industrial clusters in Bangladesh.

1.2 Scope and Limitations

The study strives to explain the pattern of development of an industrial cluster in the rural area of a developing country like Bangladesh. This study explains the role of local tradition, infrastructure, and formation of local market, and finally the role of demonstration effect in the development process of an industrial cluster. The study also

¹ Upazila is the second lowest tier local body in the Bangladesh's local government system..

quantifies the contribution of the cluster in generating income and employment opportunity for the rural poor.

The study, however, is simply a case study based on the hosiery cluster located in the Gaibandha district of Bangladesh. Thus, the findings of the study might not be generalized for other industrial clusters located in other areas of the country and also for other developing nations. Finally, we have interviewed only 150 entrepreneurs, whereas total number of entrepreneurs is nearly 2000. Thus, the problem of small sample size might be another major limitation of the study in generalizing the findings of the study.

1.3 Organization of the Study

The organization of the study report is as follows. The second chapter includes literature review with a brief conceptual framework. Description of the study area, data and sampling, and research methodology are included in the third chapter. The Fourth chapter includes data analyses and major findings of the study. Finally, chapter five contains major findings, conclusion and implications for policy makers and researchers.

Chapter II

Literature Review and the Conceptual Framework

2.1 Formation and the Role of Industrial Cluster

It has been widely recognized that the creation of alternative employment opportunity in the industrial sector other than the agriculture sector for the rural poor in developing countries is instrumental to poverty alleviation and sustainable economic development (e.g., David and Otsuka, 1994; Hayami et al., 1998; Otsuka, 2006; Sonobe and Otsuka, 2006; GOB, 2008). In South Asia and in Sub-Saharan Africa, more than 30 per cent of the total population is extremely poor (World Bank, 2007). Agriculture sector is the major employment provider in these regions, which is characterized by the high prevalence of seasonal and disguised unemployment. Moreover, as there is less scope for the expansion of the land frontier, further creation of new employment opportunities in the agriculture sector for the rural poor is difficult (Hossain, 2004). Thus, creation of employment opportunity in the industrial sector might be an important policy options to policy makers and donor agencies to eradicate poverty quickly in South Asia and Sub-Saharan Africa. The question arises as to how to create employment opportunity for the rural poor in the industrial sector.

Since Marshall (1920), it has been widely recognized that by developing industrial clusters in the rural areas of developing nations, it is possible to create enormous employment opportunity for the rural poor. Marshall pointed out three benefits of industrial cluster (Marshall, 1920, Book IV, Ch. X, p. 271). One is knowledge spillovers or technology spillovers among enterprises. Knowledge spillovers or technology spillovers is the technological external economies that arise when new ideas on new products, inputs, production organization and marketing channels of innovative entrepreneurs become available to other entrepreneurs without enough or any compensation (e.g., Krugman, 1991a; Visser, 1999). As entrepreneurs are concentrated very close to each other in a cluster, innovative ideas and best practices of the innovative entrepreneurs diffuse easily in various ways, such as demonstration effect, face-to-face interaction and exchange of parts and services among the entrepreneurs. Thus, entrepreneurs located in an industrial cluster benefit from knowledge spillovers more than isolated. In the theoretical literature on endogenous economic growth, knowledge spillovers are considered as an important contributor to sustainable economic growth (e.g., Romer 1986, 1990; Grossman and Helpman, 1991a, 1991b, 1994; Lucas, 1988, 1993).

The other two benefits of industrial clusters pointed out by Marshall are (1920) the division and specialization of labor among entrepreneurs and the formation of skilled labor markets. In industrial clusters, as entrepreneurs are located near each other, face-to-face contacts and long term direct transactions contribute to the enhancement of the division of labor. Due to division of labor, an entrepreneur might concentrate only on a small portion of the entire production processes, while taking services from other specialized service providers. Marshall (1920) argued that the division of labor is

developed in clusters because there are constant and large demands in clusters for specialized services so that specialized service providers can effectively use specialized machines. For example, there are a number of garment entrepreneurs in garment cluster in Dhaka, Bangladesh, who operate only the making and finishing sections, while buy, dye and knit yarn and wash and pack their products using services from other entrepreneurs (e.g., Mottaleb, 2007).

Because the demand for skills specific to the industry is strong in the cluster, it would be easier for workers and other specialists with such skills to find jobs/works in the cluster than in other places. Thus, industry-specific skilled workers tend to concentrate in the industrial clusters and form markets of skilled workers. The presence of market of skilled workers would, in turn, make it easier for enterprises to recruit such workers and thus reduce search cost significantly.

For all these benefits, the entrepreneurs in industrial clusters tend to be productive, and clusters tend to develop over the time dynamically, that is both in terms of number of entrepreneurs and product quality. In developing countries, industrial clusters are ubiquitous and some of them are high performing as well as major providers of employment opportunities in the industrial sector (e.g., Sonobe and Otsuka, 2006; Schmitz, 1999; Tewari, 1999). For example, garment cluster in Bangladesh, (Mottaleb, 2007, Yamagata et al., 2007), garment cluster in Jili town in Zhejiang, China (Sonobe, Hu and Otsuka, 2002), woolen knitwear cluster in Trippur, India (Tewari, 1999) and shoe cluster in Sinos Valley, Brazil (Schmitz, 1999).

Despite the inherent benefits of industrial clusters, many industrial clusters in developing countries have been performing poorly relative to what appear to be their development potential. Some of the well-known stagnant clusters are: shoe clusters in San Mateo Atenco, Mexico, furniture making cluster in Sarchi in Costa Rica, metal and repair workshop in Takora, Peru (Alttenburg and Meyer-Stamer, 1999), Eastland garments cluster in Kenya, vehicle repair and metal work cluster in Suame, Ghana and Garments cluster in Western Cape, South Africa (McCormick, 1999). It raises a question as to why some clusters expand over the time both in term of number of entrepreneurs and product quality that is dynamically, while others stay stagnant for years. Or, in other words, what are the determinants of a successful industrial cluster?

According to Schumpeter (1912), industries develop through a series of innovations and imitations, where innovation is a new combination of human and physical resources that results in higher profit. Innovators' higher profit attracts new entrepreneurs to enter the industry. Rampant imitation, however, which would naturally be expected to follow innovation in industrial clusters, reduces the profit margin of the innovators and thus reduces incentives to innovate relative to the socially desirable level, as Glaeser, Kallel, Scheinkman, and Shleifer (1992) and Sonobe and Otsuka (2006) point out. Hohenberg and Lees (1985), Martin and Ottaviano (2001), and Sonobe and Otsuka (2006) argue that industrial clusters reduce the cost of innovation of the innovative entrepreneurs by reducing transaction costs through attracting a variety of human resources including entrepreneurs, marketing specialists, and skilled workers with high education and formal training. Thus, a reduction in profit due to rampant imitation influences innovators to adopt creative destruction activities, where creative destruction means adoption of completely new type of innovative activities abandoning the old innovative activities. In

this way, an industry develops over time. The same is also applicable to the dynamic development of an industrial cluster.

The presence of a group of innovative entrepreneurs is the necessary condition for the dynamic development of an industrial cluster. The innovative entrepreneurs will adopt new knowledge and technology from outside the cluster or will create new knowledge and technology through trial and error basis by themselves. Later their improved knowledge and technology will diffuse to other entrepreneurs in the cluster, which will ultimately contribute to the dynamic development of an industrial cluster. Bell and Albu (1999) refer to such innovative entrepreneurs in dynamic clusters as “technological gate keepers”.

In comparing the developed and stagnant clusters in Latin America, Altenburg and Meyer-Stamer (1999) conjecture that almost all of the industrial clusters in the rural areas of developing countries can be tracked back to a master craftsman who learned the techniques elsewhere and starts production and trains family members, neighbours and employees. Later these employees and neighbours start their business once they gather relevant techniques and starting capital. As technology is very simple and requires small initial capital to start a business, number of entrepreneurs increases in the locality very quickly and form industrial cluster.

Altenburg and Meyer-Stamer (1999) observe that in most of the cases the entrepreneurs in these rural industrial clusters are less educated and de-linked from the vocational schools and formal training opportunities and source of knowledge. Because of the lack of new knowledge, knowledge spillovers are absent or very low in the cluster. Informal apprenticeship is the main channel of learning in such clusters. While it provides the new generation entrepreneurs with the opportunity to learn craftsmanship, it is seldom conducive to qualitative improvement such as improvements in product quality, production efficiency, marketing, and management. Over the time, these clusters expand simply in terms of number of entrepreneurs but not in terms of product quality. The number of entrepreneurs increases in the clusters mostly due to the high prevalence of unemployment rate in the rural areas accompanied by the high birth rate and the unavailability of the alternative employment opportunity in the formal industrial sector.

A vital question arises as to who leads the innovation. Because in the absence of continuous innovation, knowledge spillovers will not take place and the cluster might turn into a stagnate cluster. The existing literature seldom examines empirically the characteristics of the innovative entrepreneurs. An exception is Sonobe and Otsuka (2006) who analyzed the characteristics of the managers and entrepreneurs from eight successful clusters in Taiwan, China and Japan. They develop an endogenous model of cluster-based industrial development. According to the model, in the process of development, a cluster usually faces three distinct stages: the initiation stage, quantity expansion stage and the quality improvement stage.

In the initiation stage, a few innovative entrepreneurs initiate an industry by producing low quality imitations of imported products mainly through trial and error basis. When the product and production processes are standardized in the new industry, new entrants massively enter and spontaneously form an industrial cluster. The formation of a cluster further enhances the economies of agglomeration and thus encourages further new entry. Thus, the cluster expands in terms of the number of entrepreneurs, who mainly imitate the

innovators and produce standardized imitated products with little or no qualitative upgrading. Sonobe and Otsuka (2006) termed this stage the “quantitative expansion” stage of the cluster.

Rampant imitation by the new entrants creates the problem of excessive supply of the cluster’s main product, and thus reduces innovator’s profit by reducing the product price. This might discourage innovative entrepreneurs for further innovation. But, as the industrial cluster reduces innovation’s costs by bringing together a variety of skilled human resources and by knowledge spillovers, innovative entrepreneurs might adopt further innovation to produce high quality differentiated products by adopting “multi-faceted” innovations (Sonobe and Otsuka, 2006), that is innovation ranging from finding a new source of input to exploring new marketing channels. To produce high-quality differentiated products, innovative entrepreneurs need to use high quality materials and to employ highly skilled workers. To accrue the benefit of producing high quality products, entrepreneurs need to use new marketing channels to reach the final buyers in order to differentiate high quality products from the imitated standardized products in the market. These multi-faceted innovations by the innovative entrepreneurs lead the cluster to enter the quality improvement stage, where the entire cluster produces on an average high quality products, and some of the innovative entrepreneurs start to sell or export directly to the buyers, bypassing the local traders, and thus directly entering the global value chain. It is important to note that without any successful upgrading by the innovative entrepreneurs, the cluster might stagnate at the “quantity expansion stage” without any further development.

In characterizing innovative entrepreneurs in all of the eight successful cases, Sonobe and Otsuka (2006) find that, in general, highly educated entrepreneurs lead the multifaceted innovations and produce high-quality products. This finding of Sonobe and Otsuka (2006) highly supports the view that education enhances the ability to adopt, decode and understand information (Schultz, 1961, 1975; Becker, 1962, 1993). Information processing ability is important for facilitating development and for the adoption of new technologies (Nelson and Phelps, 1966; Levine and Kawada, 1980; Easterlin, 1981; Romer, 1990; Abramovtitz, 1989; Acemoglu, 1996). In the growth literature it is also well known that human capital plays an important role in the economic growth process, because the level of human capital significantly influences the innovation and the creation of new technology, and the capability to absorb new technology from abroad (e.g., Barro, 1991; Romer, 1989, 1990, 1986; Mankiw, Romer and Weil, 1992; Grossman and Helpman, 1994; Lucas, 1993, 1988; Nelson and Phelps, 1966). The same will apply to the development of an enterprise and industrial cluster. The level of human capital of the entrepreneurs influences the dynamic development of a cluster by influencing the capability to learn from outside sources, and thus the capability to innovate. It means, ultimately the development of an industry depends on the level of human capital of its entrepreneurs.

Chapter III

Study Area, Sampling, Data and Methodology

3.1 Study Area

The hosiery cluster, which is under our microscopic study, is located in Kochashohor union of Gobindaganj upazila in Gaibandha district, Bangladesh. Including the Gaibandha *sadar* upzalia (Gaibandha town), there are seven upazilas in the district. The district is well-connected to the capital city Dhaka and other major cities through a national highway. It is about 300 kilometers from the capital city Dhaka, and from Dhaka it takes about four hours by express bus². Gaibandha district is located in the northern part of Bangladesh. The entire northern region of Bangladesh is recurrently hit by flood, drought, and seasonal food shortage problem during September to December, which is locally known as “monga” (e.g., Zug, 2006). In a study the government of Bangladesh has declared the northern part of Bangladesh as the lagging behind part and has taken some special measures for facilitating rapid economic development (GOB, 2008).

Gobindaganj upazila is located in the southern part of Gaibandha district (Map-1). The size of the entire upazila is 481.66 square kilometers with 1,07,381 households. There are 17 unions³ and a municipality in the upazila.

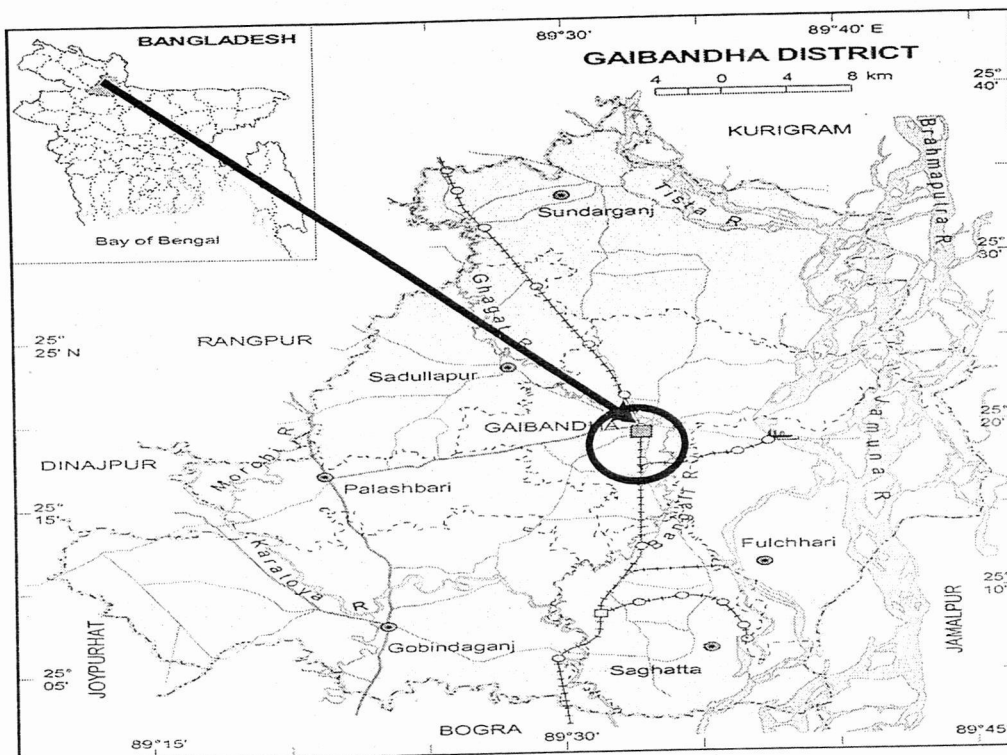
Total population of the upazila is 4,61,428 persons of whom 93 per cent live in the rural area and the rest live in the municipal area (BBS, 2001; BBS 2001a). Literacy rate is 37.76 per cent among the people aged seven years and above. Agriculture is the major profession of the people in which 67 per cent of total population is directly associated either as farmer or agriculture wage laborers for their livelihoods (BBS, 2001a). Paddy, wheat, sugarcane and jute are some of the major agricultural products and hosiery and knitwear products and weaving, goldsmith, blacksmith, bamboo work, potteries, wood work and tailoring are the most common non-farm activities performed by the people of Gobindaganj (Banglapedia, 2008).

Kochasohor union, where most of the hosiery entrepreneurs reside, is located in the southern part of the Gobindaganj upazila (Figure-2). It is well-connected with Gobindaganj Municipal town/national highway through a *pucca* road. The central point of Kochasohor union is about 45 minutes drive by a car from Gobindaganj upazila. Hosiery entrepreneurs are mainly located in this union. There is a newly developed market in the union. Later it will be explained how this market contributes enormously to the expansion of the hosiery cluster in Kochasohor union.

² Standard bus fare is Tk. 250 and bus is available from Dhaka to Gaibandha all day and every day in a week.

³ A Union is the lowest administrative tier in the local government system of Bangladesh.

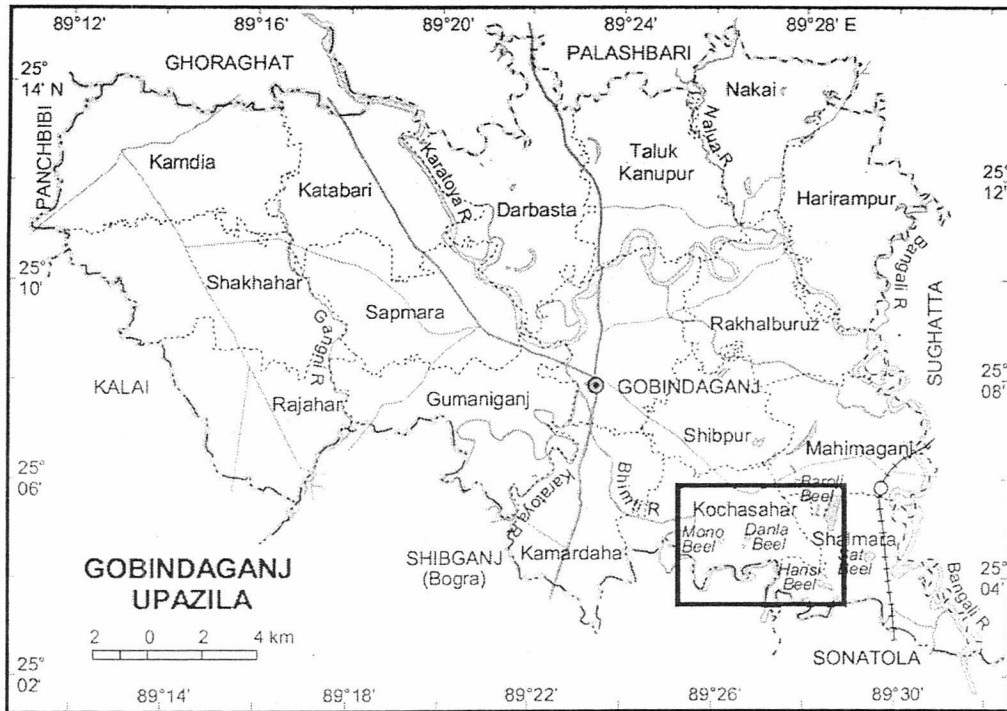
Figure 1: Location of Gaibandha District in the Map of Bangladesh



3.2 Sampling, Data Collection and Research Methodology

In 2007, December, Bangladesh Public Administration Training Centre (BPATC), a public sector training institute was conducting a survey on rural indigenous industries in Bangladesh. In that survey we sent around 250 participants of the 40th Foundation Training Programme to 41 Upazilas of 40 districts in Bangladesh. From that survey, we came to know about the hosiery cluster in Gobindaganj upazila. In January 26-29, 2008 our 10 trainee civil servants visited the hosiery cluster and collected initial level information from nearly 100 hosiery entrepreneurs. From that survey we came to know that nearly 1500 to 2000 entrepreneurs are located in the cluster with 20000 workers and hundreds of yarn traders and machine repairer. Based on this preliminary information, we decided to interview 150 entrepreneurs, 100 workers, 10 local elites, 10 drop-out entrepreneurs who have already left the industry, 20 yarn traders and 10 knitting machine repairers to understand the development pattern of the hosiery cluster in Kochasohor and its role in income and employment generation for the rural poor. According to the information provided by the entrepreneurs, the main product of the cluster is low quality sweater and cardigan and their major consumers are the street sellers in Dhaka and other cities. Some of the entrepreneurs also produce socks and woolen caps. The entrepreneurs collect yarn mostly from Kochasohor, Shawail Bazar, Bogra, Santahar, Narayanganj and Dhaka.

Figure 2: Location of Kochasohor Union/Study Area



We interviewed local elites, dropped out entrepreneurs and yarn traders to cross-check our findings on the role of clusters in income generation and to find out the determinants that contribute to the development of the hosiery cluster in Kochasohor. We simply asked them what they knew about the development of the hosiery cluster in Gobindaganj and how the cluster contributed to income and employment generation for local poor. We have collected data from the entrepreneurs on their yearly profit, total worker, machine, yearly consumption of yarn, price of yarn and marketing channels in the year 2007, 2008 and 2009. We also have collected simple opinion of the entrepreneurs on the issues of further development of the hosiery cluster in Kochasohor.

It is already mentioned that this study is based on primary information collected through questionnaire survey. Collected data have been analyzed using MS Excel and STATA (statistical software). To analyze the determinants of earnings by the workers, we have applied multiple regression analysis techniques and correlation matrix. We also have used simple t-statistics for comparison purpose. For visual presentation we have presented data in tabular forms and graphs. Finally, using MS Excel, we have used simple trend analyses to show the simple relationship between two variables.

Chapter IV

Survey, Data Analyses and Major Findings

4.1 Basic Information about the Sample Respondents

As stated in the last paragraph of the previous chapter, we have interviewed 10 local elites, 10 drop-out entrepreneurs, 20 yarn traders, 10 knitting machine repairers, 150 entrepreneurs and 100 workers. Table-1 shows the location and category of the respondents.

Table 1: Spatial Distribution of the Sample Respondents by Category of the Respondents

Village	Entrepreneurs	Worker	Yarn trader	Dropout entrepreneur	Machine Repairers	Elite
Soktipur	36	12	2	1		3
Mukondopur/Kanaipara	36	8	5	2		
Kochasohor	16	2	4		4	2
Soyghoria	12	7	1			
Dharaikandi	6	5			4	
Bongram	6	5				
Dharna	5	3	2	1		
Suderdhap	5	4				
Others	28	54	6	6	2	5
Total	150	100	20	10	10	10

Source: Survey 2009

According to table-1, sample entrepreneurs are mostly located in Mukondopur, Soktipur, Kochasohor and Soyghoria. A total of 67 per cent of the sample entrepreneurs are from these four villages. A significant number of sample workers, yarn traders, machine repairers and local elites are also drawn from these villages.

Table-2 presents the age distribution of the respondents. Sample entrepreneurs mostly belong to the age group 30 to 49 years. This age group includes nearly 60 per cent of the sample entrepreneurs. The average age of the sample entrepreneurs is 38.1 years. The workers, on the other hand, are on an average 24.5 years old and 76 per cent of them belong to the age range of 20-29 years. Later we will show that most of them were agriculture worker. The table also demonstrates the age range of the yarn trader drop out entrepreneurs' machine repairers and local elites. The average age of the yarn trader is 40.2 years. It is 42.4 years for the local elite, 34.9 years for the machine repairer and 42.6 years for the dropout entrepreneurs.

Table 2: Age Distribution of the Respondents

Age Range	Entrepreneur	Worker	Yarn Trader	Dropout entrepreneur	Machine Repairers	Local Elite
Less than 20	1	14	0	0	0	0
20-29	26	76	5	1	2	0
30-39	60	18	3	3	4	3
40-49	39	1	6	3	3	6
50-59	14	1	6	2	1	1
60 and above	10	0	0	1	0	0
Total	150	100	20	10	10	10
Group average	38.1	24.5	40.2	42.6	34.9	42.4

Source: Survey, 2009

Table-3 presents information on the general education in the form of years of schooling of the sample respondents. The last row of the table also shows the average years of schooling of the group of the respondents. According to the table, workers possess the lowest level of years of schooling, which is 6.5 years on average. The dropout entrepreneurs and machine repairer have the second lowest level of education. Their average year of schooling is 7.2 respectively. Local elites, who are mainly the school teacher and member of the local government, possess the highest of level of years of schooling, which is 13 years on average.

Table-3: Years of Schooling of the Sample Respondents

Years of Schooling	Entrepreneur	Worker	Yarn Trader	Dropout entrepreneur	Machine Repairers	Local Elite
No education	25	15	1	1	0	0
1-5	22	22	2	2	1	0
6-8	27	31	5	1	4	1
9-11	39	31	8	4	4	1
12-14	29	1	4	1	0	8
15 and above	15	0	0	0	0	0
Total	150	100	20	10	10	10
Group Average	7.9	6.5	8.8	7.2	7.2	13.0

Source: Survey, 2009

Interestingly, the table shows that a total of 25 entrepreneurs are illiterate. Probably, it reflects the fact that as technology is simple and skilled workers are readily available, entrepreneurs even with formal can survive in the industry just by imitating the innovative entrepreneurs. The table, however, shows that more than 55 per cent of the sample entrepreneurs have more than nine years of schooling. It will be interesting to explain how this heterogeneity in years of schooling of the entrepreneurs affects their innovation effort and performance. But before going to explain it, next section explains the role of the cluster in generating employment and income opportunity for the rural poor.

4.2 Roles of Hosiery Cluster in Employment and Income Generation for the Poor

To explain the observable roles of the hosiery cluster in Kochasohor in generating employment and income opportunity for the rural poor, we have developed table-4. The table shows the average number of machine and worker per enterprise per year. It shows that in 2009 on average each sample entrepreneur was equipped with more than seven machines and nearly nine workers. It is simple to calculate that if there are about 2000 entrepreneurs in Kochasohor then a total of 18000 workers are directly engaged with this industry. Moreover, hundreds of traders, yarn suppliers and machine repairers also depend on this industry. Thus, the industry has created enormous employment opportunity for the rural people in Kochasohor Union. During our FGD, however, we were informed that the workers are employed only for a few months in a year and are paid on piece rate basis. Wage employment opportunity in the hosiery cluster, however, is seasonal in nature. As winter season in Bangladesh starts from November and lasts until February, usually employment opportunity creates during July-December in a year. The rest of the months of the year, entrepreneurs seldom get production orders and workers seldom get wage earning opportunity. There are a very few entrepreneurs in the cluster, who produce in summer in advance and wait for the winter. The payment to the workers is piece rate basis. It ranges from 12 Taka to 20 Taka per piece. This piece rate system wage payment reminds that the product quality in the cluster is less important than the quantity. That is entrepreneurs are just interested about the number of products but not the quality of the products. Nonetheless, the cluster has created alternative income opportunity for the rural people. Table-4 depicts the fact.

Table-4: Enterprise Size Measured by Number of Machine and Workers (Per enterprise average per year)

Year	2007	2008	2009
Average number of machine (linking + knitting)	7.0	7.35	7.15
Average number of worker	9.4	9.43	8.27

Source: Survey, 2009

Table 5 shows that most of the entrepreneurs in the cluster are small in size. In our sample, the largest entrepreneur was equipped with 22 knitting machine with 22 paid workers and the smallest entrepreneur was equipped with only one knitting machine with no paid worker.

We stated earlier that to quantify the contribution of the hosiery cluster in employment creation and employment generation, besides entrepreneurs, we have interviewed 100 workers using a structured questionnaire. In tables 1-3 we have shown the spatial distribution of the worker, their age and years of schooling. Table-5 presents the role of the cluster in generating employment and income opportunity for the rural poor.

Table-5: Contribution of the Hosiery Cluster in Income and Employment Generation

Years of Experience	No. of Worker	% main occupation*	Month engaged*	Yearly income (Tk)*
0-3	14	85.7	6.64	22341.4
4-6	34	85.3	6.38	23124.7
7-9	42	90.5	6.76	24204.8
10 and above	10	90.0	6.40	20800.0
Total/Average	100	88.0	6.58	23236.2

Source: Survey, 2009

*Group average

Our sample workers are on an average 24.5 years old with 6.5 years of schooling and 6.43 years of experience. Out of 100 workers 67 are married. In table-5 the sample workers are presented in groups based on their years of working experience in the cluster as sweater knitter and then we have compared their prior occupation status, month's work in a year and their average yearly income.

According to table 5, a total of 14 workers have less than four years of working experience. Out of 85.7 per cent of the workers of this group reported that sweater knitting is their main occupation, and they work in the cluster for 6.64 months in a year on average and earn more than 22,000 Tk. in a year. Similarly, the table shows that a total of 42 workers having 7-9 years of working experience, work for 6.76 months in a year in the cluster and earn more than 24000 Tk. in year per person on average. The last row of the table shows that nearly 90 per cent of the workers work full time in the industry. They work for 6.58 months in a year and earn 23236.2 Tk. in a year per person on average. Importantly, most of the workers work only a few months in a year. It means, the rest of the year they can work in other sectors as well. The table thus reveals the importance of the cluster in generating employment and income creation for the rural poor. Table-6 further presents the role of the cluster in employment generation by demonstrating the previous occupation of the sample worker.

Table 6: Prior Occupation of the Worker

Previous occupation	No. of Worker	Years of schooling (group average)
Unemployed	17	6.2
Household work	16	7.3
Agriculture	29	4.3
Business	3	9.3
Other	35	7.9
Total	100	6.5

Source: Survey, 2009

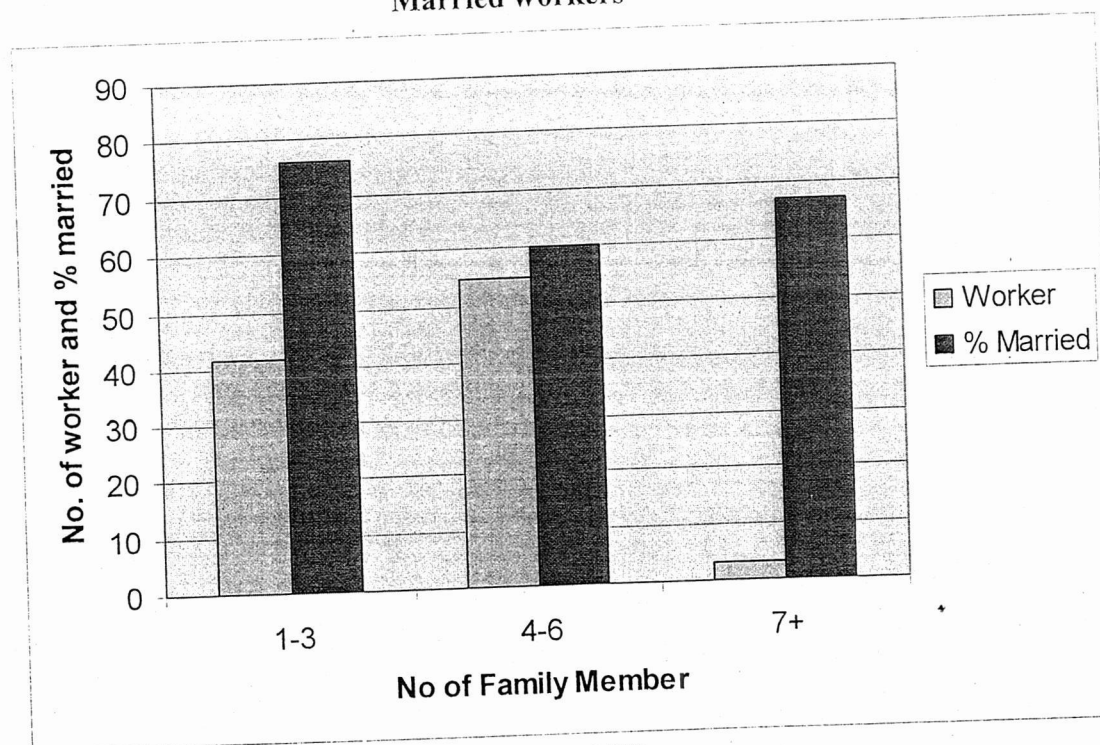
Table-6 presents the prior occupation of the sample entrepreneurs. According to the table, a total of 17 workers with 6.2 years of schooling were unemployed before entering the

cluster as worker. Similarly, 16 workers were engaged into household works, which was also an unpaid job (basically in the context of Bangladesh). Interestingly, the table shows that 29 sample workers were previously engaged into agriculture. Later, they entered the industry as worker. This finding reminds the fact that the agriculture of Bangladesh is riddled with disguised and seasonal unemployment. For attaining sustainable economic growth and for reducing poverty, the creation of “Kochasohor” type of employment opportunity in the non-farm sector is instrumental in Bangladesh.

Figure-3 presents the dependent family members of the workers, who depend on the income of the worker and percentage of married workers.

Figure-3 shows the importance of the earnings of the workers for their family. According to the Chart, a total of 42 sample workers have one to three dependent members in their families. On the other hand, 55 sample workers report that they have four to six dependent family members in their families. We did not ask the age of the dependent family members of the sample workers. But it might be the case that the schooling of the children of the sample workers might also be depended on the income of the workers. It means the investment on the human capital of the sons or daughters of the workers is also depending on the income generated from the cluster.

Figure-3: No. of Dependent Family Members of the Workers and the Percentage of Married workers



Source: Survey, 2009

Table 7 presents the prior occupation of the sample entrepreneurs and their father, which further reinvigorates the role of industrial cluster in employment and income generation for the rural poor. The table shows that a total of 30 percent of the sample entrepreneurs previously worked in the industry as workers and the same percentage of entrepreneurs previously worked in the agriculture either as day labor or farmer before starting their own production business. The entrepreneurs, who previously worked in the agriculture sector probably, were the surplus labor in the agriculture sector, which is very prevalent

in the agriculture of Bangladesh. An analysis of the father's occupation informs that the cluster is quite new as only seven percent of the entrepreneur's fathers were engaged in the industry, which means more 90 percent of the sample entrepreneurs are the first generation entrepreneurs. Table-7 shows that most of the entrepreneurs' father was engaged into agriculture, which reflects the importance of agriculture for livelihood of the rural people in the northern region of Bangladesh.

Table 7: Prior Occupation of the Entrepreneur and their Father

	No. of sample entrepreneurs	Percentage
Prior occupation of the entrepreneur		
Former worker in the industry	43	30.0
Agriculture	46	30.7
Business	30	20.0
Other	29	19.3
Prior occupation of the father of the entrepreneur		
Hosiery entrepreneur/sweater/yarn trader	10	6.7
Agriculture	110	73.3
Business	15	10.0
Other	13	10.0

Source: Survey, 2009

Table 6 and 7 thus provide some light on the importance of rural industrial cluster in generating income opportunities for the rural poor. To identify how the income that earned from the industrial cluster affects the overall development of the sample workers, we directly asked our sample workers and local elites to make comments on the socio-economic influences of the hosiery cluster in Kochasohor. Table-8 presents the opinion of the workers and local elites on the impact of hosiery cluster in Kochasohor.

Table-8: Socio-economic Impacts of the Hosiery Cluster in Kochasohor

Impact	No. of worker (a)	No. of local elites (b)	Total (a+b)
Increases schooling of the children	37	-	37
Increases the number of self-employed person	38	4	42
Improves living standard	37	3	40
Reduces unemployment	37	6	43

Source: Survey, 2009

The table shows a number of workers and local elites mention that the development of hosiery cluster in Kochasohor has created employment opportunity and thus reduce the unemployment problem. Reduction of unemployment has ultimately increased the standard of living of the local people. Importantly workers and local elites mention that due to stable income opportunity of the local people, the schooling rate among the children has increased significantly. This information is really important, because

Gaibandha is one of the districts of Bangladesh where adult literacy rate is lower than the national average. According to population census 2001, adult literacy rate (both sex) in Bangladesh was 45.3 per cent, but in Gaibandha it was only 34.5 per cent (BBS, 2009, p-497). Thus, if the opinion of the workers is true, then the hosiery cluster in Kochasohor is playing much greater role than what we can observe.

4. 2.1 Determinants of Earnings of the Worker: Who Earns More?

In the previous section we have explained that on an average a worker in the cluster works for nearly seven months in a year and earns more than 23000 Taka in a season. Table-5 shows that some groups of workers earn more compared to other group of workers. The question arises as to who earns more? In other words, what are the factors that determine the earnings of a worker? In this section we try to find the determinants of earnings of a worker.

Figure-4 shows the relationship between experience of the workers and earnings. It shows that there is no clear relationship between experience and earnings. To visualize the relationship, we have calculated a trend line using the following equation:

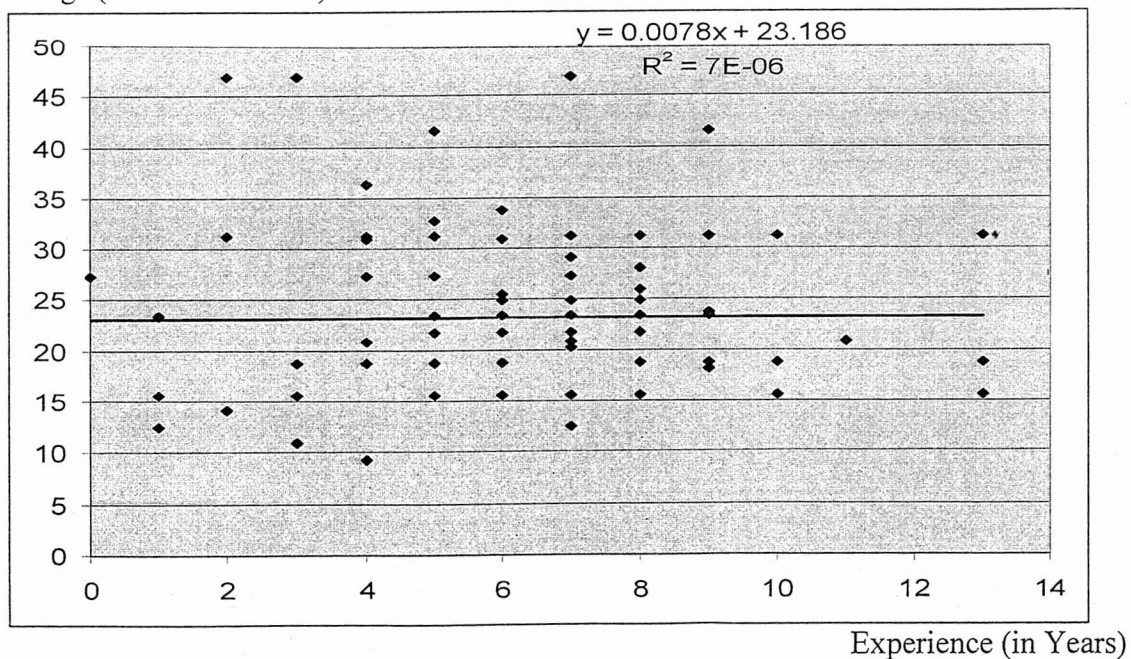
$$\text{Earnings}_i = a_0 + \text{Experience}_i \text{-----} (1)$$

Where subscript i (i=1-----100) stands for individual worker.
Our estimated trend line is as follows:

$$\text{Earnings} = 23.19 + 0.0078 \text{Exp} \text{-----} (2)$$

Figure-4: Role of Experience in Determining Earning of a Worker

Earnings (in hundred Taka)



The plain explanation of equation (2) reveals that a one-year increase in experience will add only Tk. 0.0078 as extra in the total income of the worker. It means experience has very insignificant influence on income of the worker. We will explain later why this might be the case. Similar to Figure-4, we have developed Figure-5 to show the relationship between education and earnings of the sample workers.

We have calculated a trend line using the following equation:

$$\text{Earnings}_i = b_0 + \text{Years of Schooling}_i \text{-----} (3)$$

Where subscript i (i=1-----100) stands for individual worker.

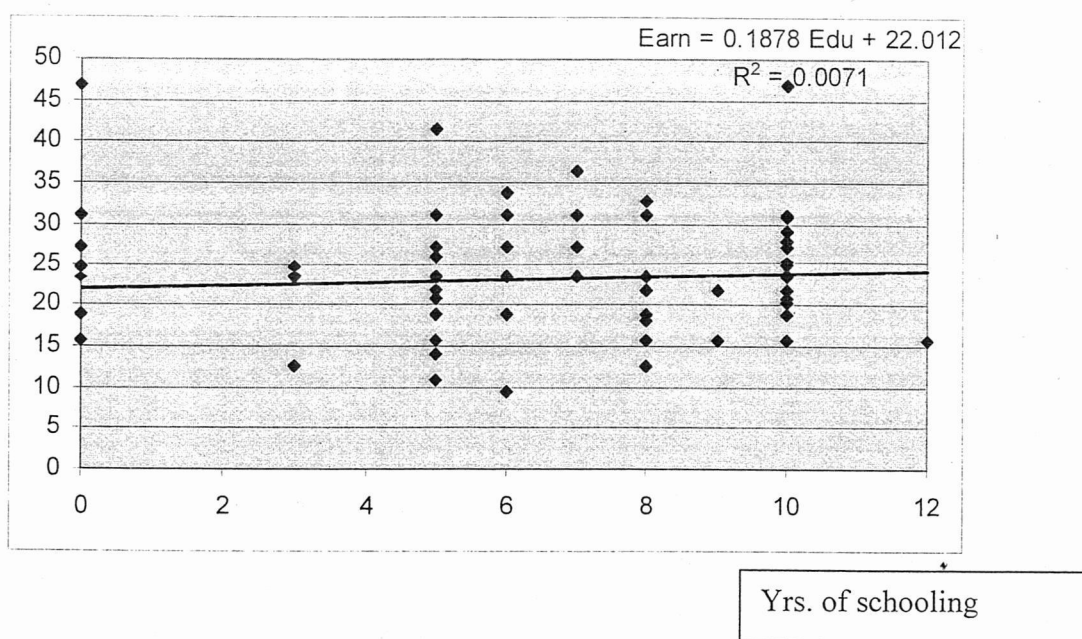
Our estimated trend line is as follows:

$$\text{Earnings} = 22.01 + 0.19 \text{ Years of Schooling} \text{-----} (4)$$

Plain explanation reveals that one-year of schooling will increase income of the worker by Tk. 0.19 only.

Figure-5: Role of Education in Determining Earning of a Worker

Earnings (in hundred Taka)



Low prediction power of model (2) and (4) as revealed by very small R-squared further confirm the insignificant influence of experience and education on earnings of the workers.

Figure-6 shows the relationship between age and earnings of the workers. Instead of simple liner trend line, we have shown here the polynomial trend line using the following equation:

$$\text{Earnings}_i = a_0 + \text{Age}_i + (\text{Age})^2_i \text{-----} (5)$$

Where subscript i (i=1-----100) stands for individual worker.

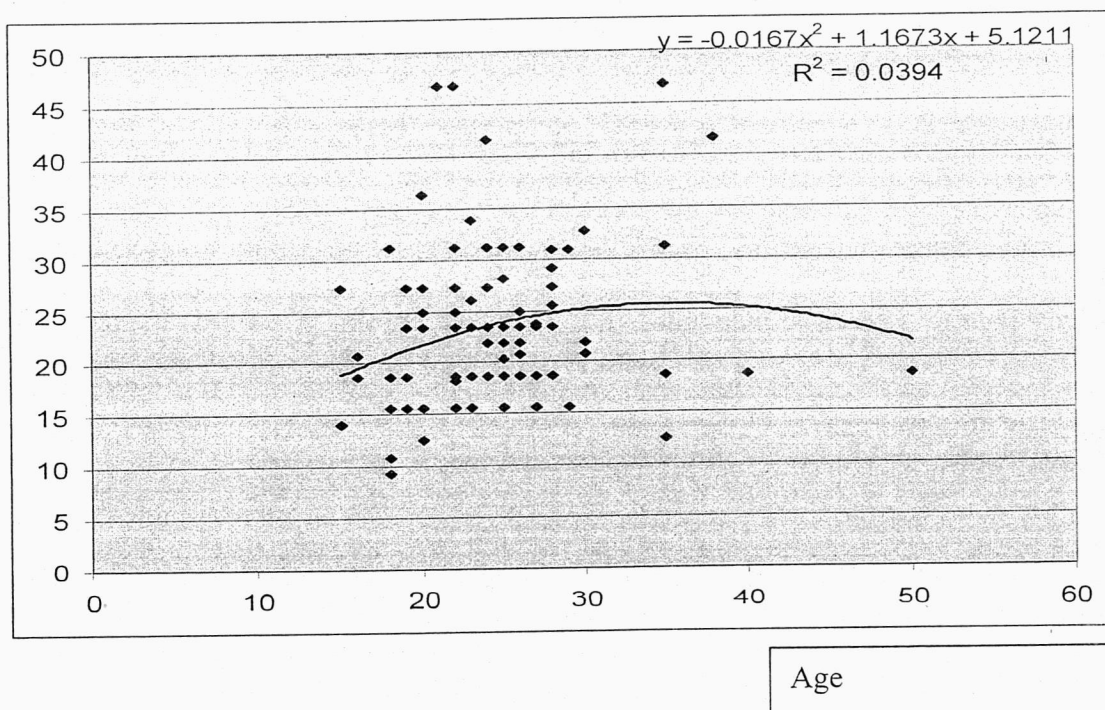
Our estimated trend line is as follows:

$$\text{Earnings} = 5.12 + 1.17 \text{ Age} - 0.0017 (\text{Age})^2 \text{-----} (6)$$

According to estimated equation (6) a one year increase in age will increase earning by taka 1.17, however as the coefficient of the age square is negative, after certain age the income of the worker will start to decrease with his increase in age. Later we will calculate the exact age of the worker after that his earnings will decline.

Figure-6: Role of Age on Earnings of the Workers

Earnings (in hundred Taka)



Our simple scatter diagrams reveal a harsh but true picture about the hosiery cluster in Kochasohor. If we believe the classical economists view that the marginal productivity of the worker determines the wage of the worker, than our analysis shows that experience and education do not have any significant influence on the productivity of the worker, and thus education and experience do not have significant influence on the earnings of the workers. It means, although the hosiery cluster has been producing since the 1950s, still today the cluster is producing simply low quality products. Therefore, application of human capital to produce higher value added products or to produce products with more esthetic value is limited. As a result, only the physical strength of a worker determines his earnings rather education and experience, which means, young workers earn more compared to others

Equation 1, 3 and 5 are the single variable equations, the results of which are more or less same to simple correlation coefficient. It does not show the causal effect. To confirm our findings strongly that there is a limited scope for applying education and experience of the workers, we specify our function explaining the earnings of the workers as follows:

$$Y_i = a_0 + a_1 X_i + a_k \sum Z_k + a_m \sum V_m + \zeta \text{-----}(7)$$

where Y_i is the income of the worker per year, X_i is a matrix of variables that include characteristics of the workers, such as years of schooling, working experience, age, marital status, number of dependent family members, $\sum Z_k$ is the dummies for prior occupations, $\sum V_m$ is the dummy for whether the present work is the major occupation or not and ζ is an error term that follows the white-noise properties, a_0 is a scalar parameter and a_k and a_m are the parameter of interests. We apply simple OLS estimation method using heteroscedastic robust standard error in the estimating the earning equation (7).

To see the non-linear effect of age (if any) we have included age-squared as an independent variable. Besides years of schooling, years of work experience and the number of family members, we have included five prior occupation dummies, dummy for whether work in the hosiery cluster is major occupation, and a dummy for marital status of the worker.

We have created five dummies on the prior occupation of the workers. These are, dummy for no prior occupation (unemployment dummy), dummy for household work, dummy for agriculture work, dummy for business and dummy for other prior occupation, such as rickshaw pulling. We have mentioned that work opportunity in the hosiery cluster is seasonal in nature and some of the workers have taken it as secondary occupation. To see its effect on earnings, we have included a dummy if the worker takes the job as his major occupation. We have also included a dummy for the married worker to see the effect of motivation to work (if any) on his earnings.

Table-9 presents the estimated function that explains the determinants of earnings of the worker. The table shows that coefficients of age and age squared are statistically significant and the coefficient of age squared is negative. This finding supports our previous findings in Figure-4, where we have shown the non-linear relationship between age and earnings. The findings in Table-9 predict that at the initial stage, earning of a worker increases with the increase in his age, however, after a specific age his earnings started to decline. The findings are plausible as almost all of the knitting process in the hosiery cluster are done manually. Thus, physical strength is an important determinant of number of sweaters that an entrepreneur will produce in a day. It might be the case that older workers tend to possess less physical strength compared to young workers. As a result, older workers can produce fewer sweaters in a day compared to young workers. Thus, when workers get old, they tend to earn less.

As we found earlier, years of schooling and work experience have no significant role on the earnings of the workers although the sign of the coefficient of years of schooling is positive. Surprisingly, the coefficient of the variable work experience appears as negative and insignificant. Literally, it means more experienced workers tend to earn less compared to less experienced workers. In fact, the sign of the coefficient of the work experience has appeared as negative probably due to the highly positive and significant

correlation among age, age squared, married dummy and years of experience (for details please see the pair wise correlation matrix in the annexure).

We have set the dummy for unemployed workers as default to examine the role of prior occupation on present earnings of the workers. The negative sign of the coefficients of all of the prior occupation dummies reflect the fact that the workers who were worked in other sectors before starting their work in the hosiery cluster, earn less compared to the workers who were unemployed before starting their work in the cluster. We found that 94 percent of the workers who were unemployed before starting their work in the hosiery cluster, have taken the sweater knitting job as their major occupation, whereas only 86 percent of the sample workers who were employed in other sectors before starting their sweater knitting job in the hosiery cluster have taken the present job as their major occupation. This might be one of the important reasons of the negative sign of the coefficients of the prior occupation dummies of the workers.

Table-9: Estimated Function Explaining the Determinants of Earnings by Worker

Dependent variable	Earnings of the worker
Estimation method	OLS
Age	0.08*** (2.62)
Square of age	-0.001** (-2.58)
Years of schooling	0.005 (0.49)
Working experience	-0.02 (-1.36)
Prior occupation dummies, where unemployment has set as default	
Dummy for prior occupation was household work	-0.34*** (-3.03)
Dummy for prior occupation was agriculture	-0.18** (-2.27)
Dummy for prior occupation was business	-0.04 (-0.18)
Dummy for other prior occupation	-0.10 (-1.44)
No. of dependent family member	-0.02 (-1.03)
Major occupation dummy (yes=1)	0.23** (2.06)
Married dummy (Married=1)	0.07 (0.93)
Constant	8.83*** (20.4)
Number of observation	100
R-squared	0.23

t-values are in the parentheses calculated based on the Heteroscedastic-Robust Standard error. ***and ** denote the level of significance at 1 percent and 5 percent levels, respectively

As is expected, the coefficient of the major occupation dummy is positive and significant at five percent level. It means on average the worker who has taken the hosiery cluster job as his major occupation earns 23 percent more money compared to the workers who have taken the hosiery cluster job as their secondary occupation. Coefficient of the married dummy is found positive but insignificant. It means marital status of the workers does not have any significant influence on his earnings.

In this section we have demonstrated the role of the hosiery cluster in generating employment and earnings for the rural poor. We have shown that the cluster has created enormous employment opportunity for the local people. We also have presented the opinion of the local people and worker on the influence of the cluster on the socio-economic issues in the locality. Among many findings, we have shown that both workers and local people believes that the cluster has been contributing positively to increase the schooling achievement for the rural children as it has created permanent income opportunity for local people.

Later we have tried to find out the determinants of the earnings of the workers. Using simple scatter diagrams and estimating regression equation we have demonstrated that the income of a worker is not positively influenced by this year of schooling and experience. Rather, income is a non-linear function of the age of the worker and after a certain age the income starts to decline. The finding thus contributes to assume that probably the main product of the cluster is crude and very low quality, which seldom requires knowledge and experience. Technology is so simple that there is less scope to use knowledge and skills of the workers to add more value to the main product of the cluster. As a result, education and work experience of the worker have less effect on their income.

Later we will judge our findings on the product quality of the cluster using information collected from our sample entrepreneurs, but before going to judge it, we need to explain, why hosiery cluster, that has created enormous employment opportunity for the rural poor has been developing in Kochasohor. In other words, what are the determinants that influence the development of the hosiery cluster in Kochasohor? The next section devotes to explain this issue.

4.3 Evolution of the History Cluster and the Factors that Influence the Development of the Cluster in Kochasohor

There is no written document on how the hosiery cluster has developed in Kochasohor. To explore the factors that contributed to the development of the hosiery cluster in Kochasohor, we conducted a focus group discussion (FGD) on June 22, 2009. In that FGD, 20 hosiery entrepreneurs, two knitting machine makers, Upazila Social Service Officer and five local elites participated. The story of the development of the hosiery cluster in Kochasohor is mainly based on the information collected from the FGD. We also specifically asked questions in the questionnaires on how the hosiery cluster has evolved in Kochasohor. Our story also has used information collected from the questionnaires.

4.3.4 The Role of Initiation of a Specialized Market

Finally, our FGD revealed that the initiation of a specialized market called “Nayarhat” in Kochasohor enormously contributed to the expansion of the hosiery cluster in Kochasohor. Before 1980s, however, the size of the hosiery cluster in terms of number of entrepreneurs was small. Entrepreneurs were mostly home-based and produced very low quality products peddled mostly inside Gobindaganj and seldom sold outside cities. There was no specialized market to buy yarn and sell the finished products. Thus, the entrepreneurs had great difficulties in collecting yarn and marketing their products. In the late 1980s, local entrepreneurs initiated a specialized market. The market is known as “Nayarhat”, which is located at Kochasohor Union and it is about nine kilometres from the Gobindaganj-Mohimaganj Highway. The initiation of market attracted yarn suppliers and traders from outside the district, which dramatically solved the problems of material procurement and product marketing.

The specialized market “Nayarhat” is now not only a place to sell sweater and buy yarn but also a place where a entrepreneur can buy second hand-knitting machine or can place order for a new machine. We were informed that using the facilities of light engineering industry and iron casting facilities in Bogra, local machine repairer could design and produce new machine according to requirement of the local entrepreneurs. As mentioned earlier, we interviewed 10 machine repairers and 20 yarn traders. Interestingly all of them have their showrooms in Nayarhat/Kochasohor

Importantly a number of entrepreneurs open up their showrooms in the market, where they meet the outside traders to collect orders. Thus, in the market place, the entrepreneurs learn and observe other entrepreneurs’ activities and techniques and receive outside market information from traders. It has immensely reduced entrepreneurs’ transaction and search costs. The drastic reduction in transaction and search costs and importantly the spillovers of valuable market information enormously contributes to the expansion of the cluster.

To cross check the information collected from the FGD, we asked the entrepreneurs and local elites to identify some factors that influence the development of the hosiery cluster in Kochasohor. Table-10 presents the opinion of the local elites and entrepreneurs on the factors that contribute to the development of the hosiery cluster in Kochasohor.

Before going to analyze the table we need to clarify what exactly we asked to the entrepreneurs and local elites. The first column of table-10 shows the items that we presented in the front of entrepreneur and local elite to mention as the influencing factor that affects the development of the hosiery cluster. For simplicity, we did not ask any complex questions, such as the role of knowledge spillover or the role of rural urban linkage in developing hosiery cluster in Kochasohor. This type of question might be difficult to understand by respondents who have only seven years of schooling on average. Finally, as multiple answers were recorded, the maximum value again each factor would be equal to the number of sample respondents. For example, if all of the entrepreneurs would think that factor 1 that is the availability of cheap labor is the most important factor that contributes to the development of the hosiery cluster in Kochasohor, then the frequency against it would be 150 for entrepreneur and 10 for local elites.

Table 10: Opinion of the Entrepreneurs and local Elites on the Factors that Contributed to the Development of Hosiery Cluster in Kochasohor (multiple responses recorded)*

Factors	Entrepren		Local Elites	
	eur	%		%
1. Availability of cheap labor	131	87.3	10	100
2. Development of sweater market in Nayarhat	118	78.7	6	60
3. High demand for the low quality sweater in the relatively cold northern part of Bangladesh	111	74.0	7	70
4. Less employment opportunity in agriculture/industrial sector	73	48.7	7	70
5. Developed transportation network	63	42.0	5	50
6. Developed transportation system with Mohimagonj and Dhaka	35	23.3	8	80

Source: Survey, 2009

*The value against each factor would be 150 at the maximum for the entrepreneur and 10 at the maximum for the local elite

Table-10 presents the opinion of the entrepreneurs and local elites on the factors that contribute to the development of the hosiery cluster in Kochasohor. Both entrepreneurs and local elites ranked the availability of cheap labor in the vicinity as the top ranked factor that contributed to the development of the hosiery cluster in Kochasohor. The opinion seems true in the sense that participation rate in economic activities by total male and female population of Gaibandha is only 49.82 per cent, whereas the national average is 58.47 per cent (BBS, 2008 P-70-71). It means unemployment rate is relatively higher in Gaibandha compared to the national unemployment rate. The second important factor, as revealed by the opinion survey, is the development of the sweater market in Nayarhat. It is mentioned by a total of 118 entrepreneurs. High demand for low quality sweater by the poor people of the northern region in Bangladesh secures the third place in rankings of important factors that influenced the development of the hosiery cluster in Kochasohor.

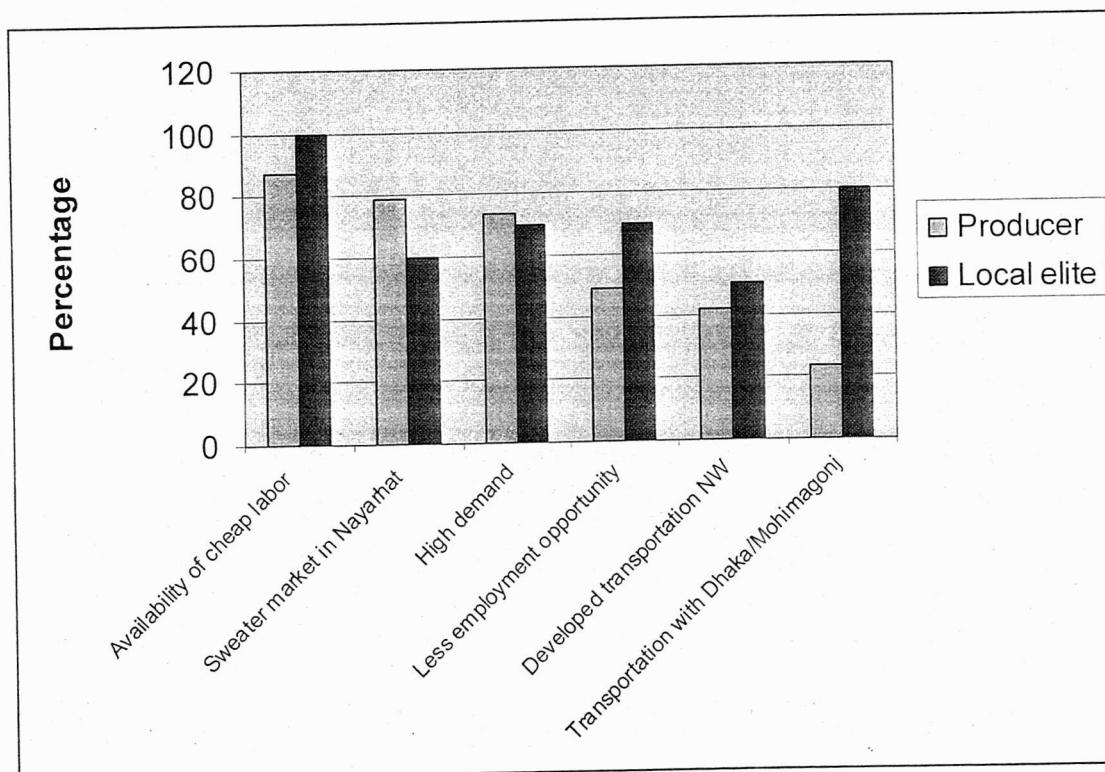
Figure-7 just the graphical presentation of the opinion of the local people on the factors that contributed to the development of the hosiery cluster in Kochasohor. Table-10 and Figure-7, however, simply present the opinion of the respondents on the factors that contribute to the development of the hosiery cluster in Kochasohor. The next section is devoted to show that the hosiery cluster has been expanding in Kochasohor due to the inherent benefit of a cluster that is due to knowledge spillover

4.3.5 The Role of Cluster itself in Expansion of the Hosiery Industry

We have already mentioned in the literature review section that formation of an industrial cluster is instrumental to the development and expansion of an industry, because industrial cluster inherently creates positive externalities to the entrepreneurs by enhancing knowledge spillover and the division of labor and by developing a pool of

skilled labor market. Among all the benefits, knowledge spillover plays important role in expansion of an industry.

Figure-7: Opinion on the Factors that Contributed to the Development of the Hosiery Cluster in Kochasohor



We have already defined that knowledge spillover regards to the positive externalities, which generated from the activities of the other entrepreneurs in the cluster. For example, new combination of machine, introduction of new products and production techniques and new marketing channels introduced by the innovative entrepreneurs in a cluster will leak to other entrepreneur. That is other entrepreneurs in the cluster who are mainly the imitators will follow the leader. In the hosiery cluster in Kochasohor, useful information leaks among the entrepreneurs through three channels.

Firstly, the initiation of the market in Nayarhat enables entrepreneurs to gather and exchange opinion with other entrepreneurs. It might be one of the important channels of receiving and disseminating useful market information among the entrepreneurs. The second channel of knowledge spillover is the spin-offs of the entrepreneurs. Workers, after accumulating necessary knowledge and capital start their own business in the cluster and just imitate their previous master. This spin-off of entrepreneurs is the main source of knowledge spillover in many clusters. The third channel is the direct observation by the entrepreneurs. As entrepreneurs are located closer to each other, clustered entrepreneurs can watch the activities of the innovative entrepreneurs easily. Thus, whenever innovative entrepreneurs initiate new machine, or sell through new marketing channels and earn higher profit, other entrepreneurs immediately follow the innovative entrepreneurs and imitate his profitable activities.

Hosiery cluster in Kochasohor also creates the usual benefits of an industrial cluster to its entrepreneurs. To support our argument, we present table-11. Table-11 presents the pattern of entry by the entrepreneurs in the industry and their prior occupation. The table shows that out of 150 sample entrepreneurs, nearly 30 per cent of them are the spin-offs of the entrepreneurs. It means, 30 per cent of the sample entrepreneurs have previously worked in other factories in the industry as worker or unpaid family member (in the family business), and after accumulating necessary knowledge and capital they have started their own factories.

A closer scrutiny in the business-starting year shows that new entrepreneurs mainly entered in the industry after 1996. That is, after the initiation of the specialized sweater market in Nayarhat and after the construction of the connecting road between Kochasohor and Gobindaganj-Mohimagonj highway. This is probably because the development of market in Nayarhat firstly solved the problems of product marketing and input procuring, which were a great burden of the initial entrepreneurs. With the development of the market the problems of product marketing and material procuring were solved. It also reduced the entry barriers to the new entrepreneurs, as new entrepreneurs do not need to think about the product marketing problem. Moreover, initiation of the market stimulates information spillover among the entrepreneurs by enhancing face-to-face interaction with each other. It ultimately, reduces the entry barriers, makes the useful market information available in the cluster and thus encourages new entrants (even without any prior experience) to start sweater production in Kochasohor. The finding of table-11 supports the argument.

Table 11: Business Starting Year and Prior Occupation of the Sample Entrepreneur

Business starting period	Prior Occupation		No. Of Sample Entrepreneur
	Worked as paid or unpaid worker in the industry	Agriculture, service, business and other	
1			
Until 1984	4	1	5 (3.3)
1985-1995	2	12	14 (9.3)
1996-2000	9	22	31 (20.7)
2001-2006	25	72	87 (58.0)
2007 and later	4	9	13 (8.7)
Total	44 (29)	106 (71)	150 (100)

Source: Survey, 2009

Especially, table-11 shows that after year 2000, a number of entrepreneurs who previously worked in the agriculture and other sectors have entered sweater production business. It means, after the initiation of the market in Nayarhat and construction of the link road, necessary information significantly spills over to the locality mainly due to the demonstration effect and also may be due to frequent meeting in the market place with the entrepreneurs. The number of entrepreneurs in the cluster was small in the late 1990s and the profit from the sweater production was high. Thus, it encouraged even farmers and others to enter the business. Due to the inherent characteristics of a cluster, skilled worker and other support services were already available in Kochasohor (such as machine repairers and yarn traders) even farmers could start sweater production business just with a simple sweater knitting machine and by imitating the production techniques.

It is, however, very difficult to quantify the role of imitation. Rather, we have tried to present some of the evidences that might better represent the extent of imitation in the cluster. Table-12 presents the main product of the cluster

Table-12: Evidence of Imitation: Major Products of the Cluster

Item	Number of Entrepreneur
Muffler	5 (3.33)
Socks	3 (2.0)
Sweater/cardigan	141 (94.0)
Missing information	1
Total	150 (100)

Source: Survey, 2009

Table-12 presents the major products of the sample entrepreneurs. We mentioned that the initial product of the cluster was a sock initiated by an innovator who brought a hand driven socks knitting machine from Kolkata. Later, entrepreneurs started to produce muffler and finally they have switched sweater production. The table shows that nearly 95 per cent of the sample entrepreneurs produce sweater, which is the major product of the cluster. The story might be like this. A few innovative entrepreneurs found that production of sweater were profitable compared to muffler and socks. Thus they started to produce sweater and earned higher profit. Other clustered entrepreneurs could easily see the product and guessed the profit. Thus, they also started to produce sweater. The finding indirectly shows role of imitation in the cluster.

Formation of hosiery cluster in Kochasohor has not only stimulated the information spillover but also attracted a number of other support service providers near to the entrepreneurs, such as machine repairers and yarn traders and sweater traders. Table-13 reinvigorates the role of the hosiery cluster in expansion of the industry. Table-13 shows that nearly 60 per cent of the entrepreneurs collect yarn from Kochasohor. It means, there are a number of yarn traders who are located in Kochasohor and supply yarn to the entrepreneurs. It thus saves the search cost of the entrepreneurs. We mentioned that we have interviewed 10 machine repairers. It is found that all of the 10 machine repairers are located in Kochasohor.

Table-13 also presents the name of the places from where the sample entrepreneurs have collected their knitting machine. It shows that nearly 50 per cent of our sample entrepreneurs have collected their knitting machine from Kochasohor, whereas Dhaka is ranked as second place in the case of supplying knitting machine to the cluster. Kochasohor union is thus now a typical industrial cluster, which is inhabited by thousands of entrepreneurs and support service providers, yarn traders, wholesalers and also inhabited with thousands of skilled workers.

Table-13: Sources of Yarn

Name of the place	Number of Entrepreneur collect yarn	Number of Entrepreneur collect knitting machine
Kochasohor	88 (58.7)	74 (49.3)
Dhaka	20 (13.3)	36 (24.0)
Shawaiel Bazar (Bogra)	28 (18.7)	
Santahar	4 (2.7)	
Narayangonj	1 (0.7)	
Nayarhat		3 (2.0)
Other		10 (6.7)
Missing information	9 (6.0)	27 (18.0)
Total	150 (100)	150 (100)

Source: Survey, 2009

Interestingly, during our reconciliation survey in Kochasohor on June 23-25, 2009, we found that a Dhaka-based 100 per cent export oriented sweater entrepreneur (the owner of K Ali Sweater Factory) has started new production unit in Gobindaganj. In the new production unit, a total of 500 workers are working. While we visited to the factory, we were informed by the manager that local tradition of hosiery production and the availability of cheap-skilled workers allure the Dhaka-based export oriented sweater entrepreneur to initiate his production unit to Gobindaganj. No doubt, it is a very important and extraordinary event for the northern region in Bangladesh. It might influence other 100 export oriented garment entrepreneurs to initiate their production in Gobindaganj, which might be a perfect weapon to fight against “monga” in the northern region in Bangladesh.

4.3.6 Imitation and Qualitative Expansion of the Cluster: The Role of Human Capital of the Entrepreneur

In the previous section, we have demonstrated the role of industrial cluster in expansion of the industry. We have shown that due to the availability of the useful information, skilled workers and all support services in Kochasohor, entrepreneurs even without any experience can enter the industry to produce hosiery products just by imitating other entrepreneurs. The influx of the new entrants in an industry, who are mainly the imitators, however, erodes the profit of the entrepreneurs. Table-14 presents the price of the sweater per piece during our sample years.

Table-14: Price of Sweater Over the Sample Year

Year	Sweater price (per piece)	% Change in Sweater price
2007	292.53	-
2008	286.11	-2.19
2009	77.58	-72.9

Source: Survey, 2009

Table-14 shows that in 2009, the price of sweater has reduced to more than 70 percent compared to the price in 2008. Product price might decrease mainly in two reasons.

Firstly, entrepreneurs in the cluster fail to upgrade the product quality. They simply produce the low quality imitated products. As a result they fail to create any demand to the middle class city based consumers. In the meanwhile the influxes of new entrants who are mainly the imitators' further increase the supply of the main product of the cluster that is sweater. With the stagnant demand for the low quality product accompanied by the increase in the supply, pushed the price of the product down. A decrease in the price of the product over the years as shown in Table-14, supports our findings in the previous section that workers have less opportunity to apply their knowledge and skills as entrepreneurs mainly produce low quality imitated products. Drastic reduction in price, however, significantly reduces the profitability of the sweater entrepreneurs'. A reduction in profit thus, discourages new entrants to enter in the cluster and at the same time forced many entrepreneurs to stop production and quit the industry.

In section 4.3 we have portrayed the determinants that influence the development of the hosiery cluster in Kochasohor. We have explained the role of physical infrastructure and initiation of the specialized market in the development of the hosiery cluster. We also have emphasized the role of the cluster itself in expansion of the industry. It is found that technology is not complex, traders; yarn suppliers and skilled worker are readily available in the area. It encourages new entrants to enter in the industry. These new entrants are mainly the imitators and produce low quality imitated products without further quality upgrading. Increase in the supply of the low quality sweater has reduced the business profitability drastically. It hampers the further expansion process of the industry. Moreover a number of entrepreneurs forced to quit the industry due to drastic reduction in the price of sweater.

In fact, there are thousands of industrial clusters in developing countries similar to the hosiery cluster in Kochasohor. These clusters firstly expand simply due to number of entrepreneurs. Most of these clusters fail to enter in the quality upgrading stage. Thus, these clusters produce simple low quality imitated products for years without any further improvement in the quality of the product.

It is mentioned in the literature review part that entrepreneur's human capital, especially general education of the entrepreneurs' plays vital role in the dynamic development of an industrial cluster. For transforming a cluster from low quality producing to a high quality consumer goods producing cluster general education of the entrepreneurs play very crucial role. It is found that entrepreneurs with higher level of general education tend to adopt innovative activities to produce differentiated product to earn higher profit. Innovative entrepreneurs' activities ultimately spillover among the clustered entrepreneurs, and thus other entrepreneurs also adopt innovative activities, produce high quality products. Ultimately the average product quality of the cluster tends to increase.

In this section, we will explain whether entrepreneurs located in the hosiery cluster in Kochasohor have taken any quality upgrading effort by adopting innovative activities while examining their level of general education.

For the purpose of simplification, we have divided the sample entrepreneurs in two groups based on their years of schooling. The first of entrepreneurs consists of entrepreneurs who have more than 10 years of schooling. The second group of entrepreneurs has years of schooling less than or equal to 10 years. We then compare the size of operation measured by the number of machine and total workers between the

entrepreneur with more than 10 years of schooling and entrepreneurs with years of schooling 10 years or less. There are 37 entrepreneurs in the sample who have years of schooling more than 10 years and there are 112 entrepreneurs in the group who have years of schooling 10 years or less.

Table -15 shows that entrepreneur' years of schooling and his size of the business measured by the number of machine and workers are positively correlated. On average, entrepreneur with more than 10 years of schooling operate a factory with 9.43 numbers of knitting and linking machine and 10.19 workers. On the other hand, entrepreneurs with 10 years or less schooling operate a business equipped with 6.39 numbers of knitting and linking machine and 7.63 workers on average. We check the statistical differences of the means of machine and workers between these two types of entrepreneurs. Column-C of table-15 shows that on average a entrepreneur with above 10 years of schooling operate 3.04 number of more machine and employ 2.55 more workers compared to the entrepreneurs with years of schooling 10 years or less. The differences in the number of machine and worker between these two groups of entrepreneurs are positive and statistically significant at one per cent level.

Table 15: A Comparison in the Operation Size between Educated and Less Educated Entrepreneurs

Item	Entrepreneurs with above 10 years of schooling	Entrepreneurs with above 10 years of schooling	A-B
	A	B	C
Number of knitting and linking machine	9.43	6.39	3.04*** (2.91)
Number of worker	10.19	7.63	2.55*** (2.33)

t-values are in the parentheses shows the differences in the sample means based on years of schooling of the entrepreneurs, ***and ** denote the level of significance at 1 percent and 5 percent levels, respectively

Findings in Table-15 confirm that entrepreneurs with years of schooling more than 10 years operates larger factories compared to other entrepreneurs. Why this might be the case? Probably entrepreneurs with more than 10 years of schooling are more innovative compared to other entrepreneurs. It means this group of entrepreneurs has taken at least some innovative activities, which made the difference in their operation size.

To show what type of innovative activities the educated entrepreneurs in the hosiery cluster in Kochasohor have adopted we have developed Table-16.

In table 16, we have divided the sample entrepreneurs in two groups based on their years of schooling. Using our questionnaire, we tried to find some differentiated innovative activities that have been adopted by the entrepreneurs in the cluster.

Use of high quality raw materials can be considered as one of the important Schumpeterian (1912) innovation in the cluster. By using high quality yarn, an entrepreneur can distinguish his products from other entrepreneurs in the cluster and

might receive higher price of his products. However, use of high quality yarn does not guarantee higher price unless the entrepreneur convey the correct signal to his customers. In order convey message to the customer about the quality of the product he needs to use different marketing channels. One of the ways to market the quality product is to open up a showroom, where entrepreneurs can meet some exclusive customers. Otherwise entrepreneurs might sell his products to the wholesalers who will just give him average price without appreciating the product quality. Thus, the use of high quality yarn and opening a showroom might be considered as innovative activities adopted by the entrepreneurs in the hosiery cluster in Kochasohor. In Table-16 we have tried to identify the entrepreneurs those who use high quality yarn, measured by price of yarn per kilogram and those who have a showroom in Nayarhat/Kochasohor.

Table 16: A Comparison in the Product Upgrading Efforts between Educated and Less Educated Entrepreneurs

Item	Entrepreneurs with above 10 years of schooling	Entrepreneurs with above 10 years of schooling	E-F
	E	F	G
Price of yarn (kg)	121.62	103.39	18.23** (2.05)
Percentage having a showroom	24.0	13.0	11** (1.77)
Number of entrepreneur in the group	37	112	

t-values are in the parentheses shows the differences in the sample means based on years of schooling of the entrepreneurs, ***and ** denote the level of significance at 1 percent and 5 percent levels, respectively

Table -16 shows that entrepreneurs with years of schooling 10 years and above buy yarn at price more than 121 Taka per KG whereas the other group of entrepreneurs buys yarn per KG at taka 103. Column-G of Table-16 shows that on average a entrepreneur with 10 years more years of schooling spend more than 18 Taka for per KG of yarn compared to entrepreneurs with years of schooling 10 years or less. The difference in the yarn price between these two types of entrepreneurs is positive and statistically significant at 5 percent level. Similarly, the entrepreneurs with higher years of schooling have 11 percent point higher tendency to open a showroom compared to the entrepreneurs with years of schooling 10 years of less and the difference is statistically significant at 5 percent level.

The analysis in section 4.3.6 reveals that although imitation is rampant in the hosiery cluster in Kochasohor, a few educated entrepreneurs have been practicing some innovative activities and for their innovative activities educated entrepreneurs are performing well as they are operating larger factories compared to other entrepreneurs. These innovative entrepreneurs are in fact working as technological gatekeepers. That is they are generating new useful information in the cluster through trial and error basis or through imitation from outside the cluster. Through knowledge spillover, other entrepreneurs are learning about those innovative activities and imitating the innovators. Probably, this is the hidden secret in the development of the hosiery cluster in Kochasohor.

4.3.7 Regression Analysis

Model Specification

The findings in table 15 and 16 reveal that entrepreneurs with higher years of schooling are more likely to be innovative and tend to operate larger plants compared to the less educated or uneducated entrepreneurs. In table 15 and 16, however, we have not controlled for the influence of other variables. To characterize the entrepreneurs who operate larger plants, we estimate the following reduced form equation :

$$\ln(Y)_{it} = \lambda_0 + \lambda_i X_{it} + \sum \theta_j W_j + \sum \phi_j Z_i + \sum \xi_k V_k + \sum \Pi_l N_l + \chi_{it} \text{-----} (8)$$

Where Y is a vector of dependent variables that include natural log number of workers and number machine employed by the entrepreneur, X_{it} is a matrix of variables that include years of operation and age of the entrepreneurs W_j is a matrix of variables that include five dummies for the years of schooling of the producers, where the default group is the zero years of schooling, Z_i is the matrix of variables that include four dummies for the prior occupation of the entrepreneurs where the default group is the entrepreneurs those who have worked in the industry as worker prior to start their own business, V_k is the dummies for occupation of the father of the entrepreneurs where the default group is those who worked in the industry, N_l is the three years dummies for years 2007, 2008 and 2009. Due to some time invariant data, such as years of schooling and prior experience dummies, we cannot apply fixed effect estimation process. Rather we estimate the equation using OLS estimation process, applying robust standard error that corrected at the enterprise level. It provides us efficient estimators' equivalent to the application of random effect model.

4.3.8 Estimation Results

Table 17 presents the estimated functions explaining the size of operation of the sample entrepreneur where the size is measured by the number of workers and machine. It shows that coefficient of schooling dummies for 11-12 years and 12 years above are significant and positive across the estimated functions. It means entrepreneurs with more than 10 years of schooling employed more workers and machine compared to entrepreneurs with no formal schooling. For example, entrepreneurs with 11-12 years of schooling appoint more than 45 percent more workers compared to the entrepreneurs with no formal schooling. Similarly, entrepreneurs with 12 or more years of schooling appoint on average 56 percent more machine and 51 percent more workers compared to the uneducated entrepreneurs.

Age and years in present business are found significant and positive in the estimated function explaining the number of machine and workers appointed by the entrepreneurs prior occupation dummies of the entrepreneur and father's prior occupation dummies have no systematic significant effect on the employment of machine and workers by the sample entrepreneurs.

Thus, the findings in table 17 support the view that education enhances people's information receiving and processing ability and to response to the emerging demand and it ultimately enhance the return to schooling.

Table 17: Estimated Functions Explaining Number of Machine and Workers Employed by the Entrepreneurs

Dependent variables	ln (No. of machine)	ln (No. of workers)
Schooling dummies (default group is no formal schooling)		
Years of schooling 1-8 years (yes=1)	0.15 (0.86)	0.09 (0.61)
Years of schooling 9-10 years (yes=1)	0.18 (1.19)	0.14 (0.96)
Years of schooling 11-12 years (yes=1)	0.51*** (3.04)	0.43*** (2.79)
Years of schooling above 12 years (yes=1)	0.56** (2.27)	0.51*** (2.63)
Age	0.01** (2.03)	0.015*** (2.87)
Years of operation	0.025*** (3.01)	0.024*** (2.61)
Prior occupation dummies (default group is prior worker in the industry)		
Agriculture (yes=1)	0.01 (0.05)	0.02 (0.15)
Business (yes=1)	0.14 (0.87)	0.14 (0.96)
Other (yes=1)	-0.05 (-0.34)	-0.02 (-0.18)
Father's occupation dummies (default group is father was in the hosiery industry)		
Agriculture (yes=1)	-0.52* (-1.69)	-0.32 (-1.01)
Business (yes=1)	-0.26 (-0.74)	-0.001 (-0.00)
Other (yes=1)	-0.48 (-1.50)	-0.16 (-0.50)
Year 2008 dummy	0.03 (0.80)	0.001 (0.06)
Year 2009 dummy	-0.03 (-0.67)	-0.19*** (-3.98)
Constant	1.3*** (3.48)	1.36*** (3.55)
<i>N</i>	442	441
<i>R</i> ²	0.20	0.19

t-values are in the parentheses calculated based on the heteroscedastic standard errors corrected at the enterprise level using clustered standard error, *, ** and *** present the level of significance at 10%, 5% and 1% levels, respectively.

It might be the case that the entrepreneurs with higher years of operation and age have more opportunities to learn from learning by doing activities, and to reinvest the earnings to the business compared to the young entrepreneurs and new entrants. Moreover, assuming the less functional credit market in the rural areas, entrepreneurs with longer years of operation tend to be large as they have wider opportunities to reinvest earnings from the business.

4.3.9 Problems of the Hosiery Cluster: Opinion of the Entrepreneurs

We asked the entrepreneurs to mention some of the most important problems they are facing. Our findings show that problem with the electricity has ranked as the major problem. According to the entrepreneurs, almost every day on average they do not get electricity for two to three hours. Moreover, during the dry season, entrepreneurs do not get electricity during the first-half of the night. During our interview we found that a few of the entrepreneurs are using generators. The entrepreneurs who are using generators told us that use of generator increases production significantly. Moreover, as purchasing a generator requires a large amount of money, most of the entrepreneurs simply cannot afford it. The electricity problem thus reduces the utilization of the production capacity of the entrepreneurs and also increases the production cost.

The second most important problem identified by the entrepreneurs is the quality of yarn. As it is already mentioned, entrepreneurs collect yarn mostly from Kochasohor and a few innovative entrepreneurs collect yarn from Dhaka. Entrepreneurs who collect yarn from Kochasohor informed that the quality of the yarn is not good and sometimes traders cheat them by selling wet yarn. That is to make wet, yarn traders mix water with the yarn and sell it to the entrepreneurs. It not only increases the production costs but also deteriorates the product quality drastically.

Entrepreneurs also mention the shortage of working capital as another important problem. To operate day-to-day business, entrepreneurs require liquid money. However, there are a few commercial banks in the Kochasohor and most of them are reluctant to provide working capital loan.

Entrepreneurs mentioned that most of them use simple electric iron before packaging the sweater. According to the entrepreneurs the product quality might be increased significantly if they could iron the product using gas-driven steam iron. Thus, they request the government to provide gas connection in the Kochasohor area.

We also asked the entrepreneurs to make comments on how to eradicate the existing problem of the hosiery cluster in Kochasohor. According to them, the government must solve the electricity problem for further development of the hosiery cluster in Kochasohor. To solve the problem of working capital, they request the government to establish specialized bank in Kochasohor and to provide interest free loan to the entrepreneurs. They also request the to take some effective steps so that they can get quality yarn at the market price. Finally, after studying the feasibility, gas connection might be extended to Kochasohor area especially to the hosiery entrepreneurs in Kochasohor.

Chapter V

Conclusion and Policy Recommendations

Population in Bangladesh has been increasing rapidly over the years. As a result labor force of the country has been increasing tremendously. To reduce poverty and to attain sustainable economic growth, it is imperative for Bangladesh to create stable income and employment opportunity for the growing labor force of the country. As agriculture sector in Bangladesh has been suffering from the problems of disguised and seasonal unemployment, income and earning opportunities for the growing labor force should be created in the non-farm industrial sector.

Our study demonstrates that the development of local tradition-based industrial cluster is instrumental in generating employment and income opportunity for the rural poor. Using the hosiery cluster located in Kochasohor Union of Gobindaganj Upazila of Gaibandha district as a case, we have demonstrated that the creation of employment opportunity in the industrial sector not only provides income opportunity to the poor, but also increases investment on human capital by increasing school enrollment. We have collected primary data using structured questionnaires from entrepreneurs, entrepreneurs who have quitted the industry, machine repairers, local elites and workers.

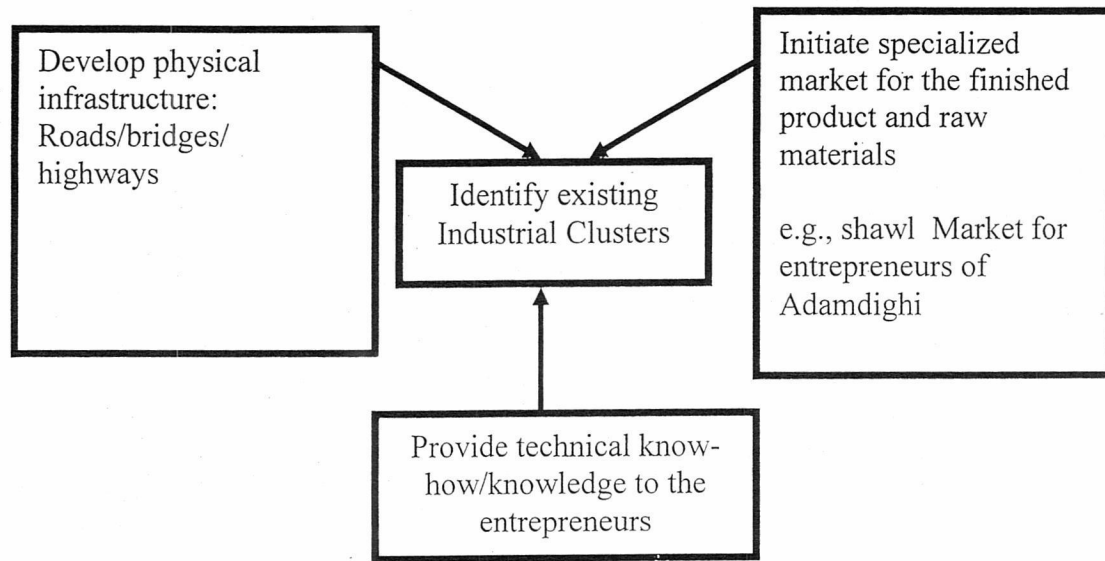
Using primary information we have explained how the local tradition of socks knitting in Kochasohor later contributed to the development of a vibrant hosiery cluster. In developing hosiery cluster in Kochasohor, we have demonstrated that the role of rural transportation networks especially the role of link roads and the initiation of a specialized market in Nayarhat played important roles in the development of the hosiery cluster in Kochasohor.

We also have demonstrated that the initiation of a cluster is particularly important for the expansion of the industry as cluster itself creates virtual circles of further development by generating positive externalities to the entrepreneurs through information spillover, enhancing the division of labor and by attracting a number of service providers to the cluster. We have mentioned that due to the local tradition of sweater knitting and the availability of the skilled worker, a Dhaka-based 100 per cent export oriented sweater entrepreneur has setup his production unit in Gobindaganj, where nearly 500 workers are working. This is a single most important event for the northern region in Bangladesh. If the region could attract a few more 100 per cent export oriented large sweater entrepreneurs in the region, probably, “monga” will never appear in the region.

Finally, we have tried to demonstrate the role of human capital in the dynamic development of a cluster. We have shown that the entrepreneurs with higher level of general education adopt different upgrading efforts to produce high quality products in order to earn higher profit. Entrepreneurs with higher level of general education thus play important role in the qualitative upgrading of a cluster.

In Bangladesh, we have thousands of small traditional industrial clusters, which are distributed all over the country. Further development of these clusters might create plenty of income and employment opportunities for the rural poor. To suggest how to develop the existing industrial clusters in Bangladesh, we develop the following simple model:

Model 1: Model of Development for the Existing Cluster



If the cluster not inhibited by educated entrepreneurs, necessary training can be provided to the entrepreneurs with special efforts to encourage innovation by the entrepreneurs

Specific Recommendations:

1. Areas where rural industrial clusters are located should be linked with the local highway, road networks. In the possible cases, gas and electricity supply should be ensured.
2. Specialized product based market should be initiated in the areas where industrial clusters are located.
3. Necessary knowledge and technology should be injected to the clusters to promote the quality upgrading process. In the process of transferring knowledge and technology, government organizations and international donor agencies such as JICA, JETRO, UNDP and UNIDO should be involved.
4. The information on rural clusters and their products should be disseminated nationwide. The products of the major rural industrial clusters in Bangladesh might be displayed in the national trade fair. It might influence other city-based entrepreneurs to produce and to expand their production units in the rural areas of Bangladesh, which might be instrumental to poverty alleviation and sustainable development.

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Annex-A

Table-1: Correlation Matrix with the Level of significance of the Coefficient

	income	age	Square of age	Years of schooling	Married dummy	Years of working experience	Major occupation dummy	Dependent family member
income	1							
	0.15							
age	(0.14)	1						
	0.12	0.98***						
Square of age	(0.23)	(0)	1					
Years of schooling	0.08	0.01	-0.05	1				
	(0.40)	(0.96)	(0.65)					
Years of working experience	0.002	0.31***	0.24***	0.06	0.40***	1		
	(0.97)	(0.0)	(0.01)	(0.56)	(0.0)			
Major occupation dummy	0.19	-0.08	-0.05	-0.03	-0.13	0.06	1	
	(0.6)	(0.43)	(0.60)	(0.73)	(0.20)	(0.54)		
Dependent family member	-0.0937	0.1047	0.11	0.0566	-0.19**	0.017	-0.08	1
	(0.35)	(0.29)	(0.29)	(0.58)	(0.05)	(0.85)	(0.41)	

P-values are in the parentheses

*** and ** presents the level of significance at 1% and 5% level.

বাংলাদেশ লোক-প্রশাসন প্রশিক্ষণ কেন্দ্র
সাভার, ঢাকা।

বর্তমান উৎপাদন/প্রস্তুতকারকদের নিকট হতে তথ্য সংগ্রহের প্রণীত প্রশ্নপত্র

Project title: Determinants of a Successful Rural Industrial Cluster: The Case of the Sweater Industry in Gobindaganj Upazila of Gaibandha District, Bangladesh.

সাড়াজ্ঞকার গ্রহণের তারিখঃ

ID. No.

তথ্য সংগ্রহকারীর নাম ও মোবাইল নংঃ

সাধারণ তথ্যাবলীঃ

- ১। নাম ও ঠিকানা
নামঃ গ্রামঃ ইউনিয়নঃ মোবাইল নংঃ ২।
বয়স
- ৩। সর্বোচ্চ শিক্ষাগত যোগ্যতাঃ
- ৪। স্ত্রীর বয়সঃ
- ৫। সন্তান সন্তানতির সংখ্যাঃ ছেলেঃ মেয়েঃ
- ৬। পরিবারের মোট সদস্য সংখ্যাঃ
- ৭। উপার্জনকারী সদস্য সংখ্যাঃ
- ৮। মোট মালিকানাধীন জমির পরিমাণঃ
- ৯। উৎপাদন শুরুর বছরঃ
- ১০। শুরুর সময় কতটি নিটিং/লিংকিং মেশিন এবং শ্রমিক নিয়ে শুরু করেছিলেন

আইটেম	সংখ্যা
নিটিং মেশিন	
লিংকিং মেশিন	
শ্রমিক	

- ১১। শুরুর সময় ওয়ার্কিং ক্যাপিটেল কত টাকা ছিল?
- ১২। পূর্বের পেশার বিবরণ (টিক ✓ দিন)ঃ
 - ১) পারিবারিকভাবে সোয়েটার উৎপাদনের সাথে জড়িত ছিলেন

- ২) বেতনভুক্ত কর্মী হিসেবে সোয়েটার শিল্পে কাজ করতেন
- ৩) কৃষি কাজ
- ৪) ব্যবসা
- ৫) অন্যান্য (লিখুন)

১৩। বর্তমান পেশার পূর্ণ বিবরণ (টিক $\sqrt$ দিন ও লিখুন):

পেশার বিবরণ	প্রধান পেশা	দ্বিতীয় প্রধান পেশা
সোয়েটার উৎপাদন		
কৃষি/ফসল উৎপাদন		
অন্যান্য পেশা (লিখুন):		
কত মাস এই পেশার নিয়োজিত থাকেন?		
মোট আয়ে পেশা থেকে প্রাপ্ত আয় (শতাংশে)		

১৪। উৎপাদনকারীর বাবার পেশার বিবরণ (টিক $\sqrt$ দিন):

- ১) সোয়েটার প্রস্তুতকারক/বিক্রেতা/সুতা বিক্রেতা
- ২) কৃষি
- ৩) অন্য ব্যবসা (লিখুন):
- ৪) অন্যান্য (লিখুন):

১৫। প্রধান উৎপাদিত দ্রব্য (টিক $\sqrt$ দিন উত্তর একাধিক হতে পারে):

- ১) সোয়েটার
- ২) মাফলার
- ৩) মোজা

১৬। মেশিনের সংখ্যা

মেশিনের নাম	২০০৭	২০০৮	২০০৯
নিটিং মেশিন			
লিংকিং মেশিন			
অন্যান্য মেশিন (লিখুন)			

১৭। নিয়োজিত শ্রমিকের সংখ্যা

২০০৭	২০০৮	২০০৯
পুরুষঃ	পুরুষঃ	পুরুষঃ
মহিলাঃ	মহিলাঃ	মহিলাঃ
মোটঃ	মোটঃ	মোটঃ

১৮। প্রাথমিক মূলধনের উৎসঃ (টিক $\sqrt$ দিন উত্তর একাধিক হতে পারে)

- ১) নিজস্ব সঞ্চয়
- ২) সম্পদ বিক্রয়ের অর্থ
- ৩) এন জি ও হতে ঋণ
- ৪) ব্যাংক ঋণ
- ৫) স্থানীয় মহাজনের নিকট হতে ঋণ
- ৬) অন্যান্য (লিখুন)

১৯। কোথা থেকে আপনি সুতা ক্রয় করেন?

২০। স্থানীয় নয়ারহাট বাজারে কতটি সুতার দোকান আছে?

২১। আপনি কখনও ফরিষাদের নিকট হতে অগ্রীম হিসেবে সুতা নিয়েছে কি (টিক $\sqrt$ দিন)ঃ

- ১) হ্যাঁ
- ২) না

২২। সুতার দাম ও ব্যবহার

	২০০৭	২০০৮	২০০৯
সুতার নাম (প্রতি কেজি/পাউন্ড)			
মোট ব্যবহার (কেজি/পাউন্ড)			

২৩। উৎপাদন ও দামঃ (প্রতি পিচ দাম)

	২০০৭	২০০৮	২০০৯
সোয়েটার	সংখ্যাঃ দাম :	সংখ্যাঃ দাম :	সংখ্যাঃ দাম :
মোজা	সংখ্যাঃ দাম :	সংখ্যাঃ দাম :	সংখ্যাঃ দাম :
মাফলার	সংখ্যাঃ দাম :	সংখ্যাঃ দাম :	সংখ্যাঃ দাম :

২৪। বাজারজাতকরণের বিবরণ (শতকরা অনুপাত)

	২০০৭	২০০৮	২০০৯
ফরিয়াদের নিকট			
সরাসরি ক্রেতা/বড় দোকানের নিকট			
মোট	১০০ শতাংশ	১০০ শতাংশ	১০০ শতাংশ

২৫। নয়ার হাটে আপনার কোন শো রুম আছে কি না (টিক $\sqrt$ দিন):

১) হ্যাঁ ২) না

২৬। উত্তর হ্যাঁ হলে কোন বছর হতে শো রুম চালু করেছেন?

২৭। অন্যান্য খরচ

খরচের খাত	২০০৭	২০০৮	২০০৯
বিদ্যুৎ			
ফোন/ফ্যাক্স			
মোট	১০০ শতাংশ	১০০ শতাংশ	১০০ শতাংশ

২৮। আপনি নিটিং মেশিন সংগ্রহ করেছিলেন কোথা থেকে?

২৯। কিভাবে কোচাশহরে সোয়েটার শিল্পের বিকাশ হয়েছে?

৩০। কি কি কারণে কোচা শহরে এই শিল্পের বিকাশ ঘটেছে (টিক $\sqrt$ দিন উত্তর একাধিক হতে পারে):

- ১) কম মজুরীতে সহজে শ্রমিক পাওয়া যায়
- ২) উন্নত রাস্তাঘাট
- ৩) কৃষিতে/অন্য কোন ক্ষেত্রে কর্মসংস্থানের সুযোগ না থাকা
- ৪) মহিমাগঞ্জ/কোচাশহর/ঢাকার সাথে উন্নত সড়ক পরিবহন ব্যবস্থা
- ৫) উত্তরাঞ্চলে শীতের প্রকোপ ও নিম্ন আয়ের মানুষের নিম্ন মানের গরম কাপড়ের চাহিদা
- ৬) নয়ারহাটে সোয়েটার মার্কেট এর বিকাশ
- ৭) অন্যান্য (লিখুন):

৩১। এই শিল্পের বিকাশে প্রধান সমস্যা গুলি কি কি ?

১)

২)

৩)

৩২। এই শিল্পের বিকাশে কি কি করা যেতে পারে?

১)

২)

৩)

৩৩। এই শিল্পের অবদান ও ভবিষ্যৎ সম্পর্কে একজন উৎপাদনকারী হিসেবে আপনার অন্যান্যমতামত (যা থাকে) তা বলুনঃ

বাংলাদেশ লোক-প্রশাসন প্রশিক্ষণ কেন্দ্র
সাভার, ঢাকা।

যে উৎপাদক এখন আর উৎপাদনে নেই তাদের জন্য প্রণীত প্রশ্নপত্র

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সাড়াজ্ঞার গ্রহণের তারিখঃ

ID. No.

তথ্য সংগ্রহকারীর নাম ও মোবাইল নংঃ

১। নাম ও ঠিকানা

২। মোবাইল নংঃ

৩। বয়স

৪। সর্বোচ্চ শিক্ষাগত যোগ্যতাঃ

৫। বর্তমান পেশাঃ (টিক $\sqrt{\quad}$ দিন)

১) কৃষি

২) ব্যবসা

৩) চাকুরী

৪) অন্যান্য

৬। আপনি কবে শুরু করেছিলেন শুরুর বৎসরঃ

৭। শুরুর সময় কতটি নিটিং লিংকিং মেশিন এবং শ্রমিক নিয়ে শুরু করেছিলেন?

আইটেম	সংখ্যা
নিটিং মেশিন	
লিংকিং মেশিন	
শ্রমিক	

৮। শুরুর সময় ওয়ার্কিং ক্যাপিটেল কত টাকা ছিল ?

৯। আপনার প্রধান উৎপাদিত দ্রব্য কি ছিল (টিক $\sqrt{\quad}$ দিন)

১। সোয়েটার ২। মোজা ৩। মাফলার

১০। উৎপাদন বন্ধ করলেন কোন বৎসরে ?

১১। উৎপাদন বন্ধ করার বছরে উৎপাদিত পণ্যের দাম গড়ে কত ছিল (প্রতি পিচ)ঃ

১) সোয়েটার (টাকা)ঃ ২। মোজা (টাকা)ঃ ৩। মাফলার (টাকা)ঃ

১২। কি কি কারণে আপনি উৎপাদন বন্ধ করতে বাধ্য হলেন? (টিক $\sqrt{\quad}$ দিন)

- ১) উৎপাদিত পণ্যের দাম ও চাহিদা কম
- ২) তীব্র প্রতিযোগিতা
- ৩) উৎপাদিত পণ্যের মান খারাপ
- ৪) এই ব্যবসা সম্পর্কিত পূর্ব অভিজ্ঞতা না থাকা
- ৫) লোন নিয়ে লোন শোধ দিতে না পারা
- ৬) অন্যান্য (উল্লেখ করুন)ঃ

১৩। কি ভাবে এই শিল্পের উন্নয়ন ঘটানো সম্ভব বলে আপনি মনে করেন ?

- ১)
- ২)
- ৩)

১৪। আপনার অন্যান্য (যদি থাকে) মতামত দয়া করে লিপিবদ্ধ করুনঃ

বাংলাদেশ লোক-প্রশাসন প্রশিক্ষণ কেন্দ্র
সাভার, ঢাকা।

সোয়েটার শ্রমিকদের জন্য প্রণীত প্রশ্নপত্র

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সাজাংকার গ্রহণের তারিখঃ

ID. No.

তথ্য সংগ্রহকারীর নাম ও মোবাইল নংঃ

সাধারণ তথ্যাবলীঃ

১। নাম ও ঠিকানা

নামঃ

গ্রামঃ

ইউনিয়নঃ

মোবাইল

নংঃ ২। বয়স

৩। সর্বোচ্চ শিড়াগত যোগ্যতাঃ

৪। বৈবাহিক অবস্থা (টিক $\sqrt$ দিন) : ১) বিবাহিত ২) অবিবাহিত

৫। কোন বছর থেকে আপনি কর্মী হিসেবে কাজ শুরু করেছেন?

৬। সোয়েটার উৎপাদন কর্মী হিসেবে কাজ শুরুর আগে আপনি কি করতেন (টিক $\sqrt$ দিন)

১) কিছু করতেন না

২) গৃহস্থালী কাজ করতেন

৩) কৃষি

৪) ব্যবসা (লিখুন)

৫) অন্যান্য (লিখুন)

৭। সোয়েটার শিল্পে কাজ করা আপনার প্রধান পেশা কি না? (টিক $\sqrt$ দিন)

১) হ্যাঁ

২) না

৮। বছরের কতদিন/মাস আপনি শ্রমিক হিসেবে কাজ করেন ?

৯। বর্তমানে দৈনিক গড় আয় কত টাকা ?

১০। আপনার আয়ের ওপরে আপনার পরিবারের কতজন সদস্য নির্ভরশীলঃ

১১। এই শিল্পের পরিপূর্ণ বিকাশে কি কি বাধা আছে বলে আপনি মনে করেন ?

১)

২)

৩)

৪)

১)

১২। এই বাধা দূরীকরণে কি কি পদক্ষেপ নেওয়া যেতে পারে ?

১)

২)

৩)

৪)

৫)

১৩। এই শিল্পের বিকাশে অত্র এলাকায় যে প্রভাব পড়েছে তা বলুনঃ

১৪। আপনার অন্যান্য (যদি থাকে) মতামত দয়া করে লিপিবদ্ধ করুনঃ

বাংলাদেশ লোক-প্রশাসন প্রশিক্ষণ কেন্দ্র
সাভার, ঢাকা।

স্থানীয় গন্যমান্য ব্যক্তিবর্গের মতামত জরীপের জন্য প্রণীত প্রশ্নপত্র

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সাড়গাৎকার গ্রহণের তারিখঃ

ID. No.

তথ্য সংগ্রহকারীর নাম ও মোবাইল নংঃ

তথ্য প্রদানকারীর সাধারণ তথ্যঃ

- ১। নাম ও ঠিকানা
গ্রামঃ ইউনিয়নঃ উপজেলাঃ
- ২। মোবাইল নংঃ
- ৩। বয়স
- ৪। সর্বোচ্চ শিক্ষাগত যোগ্যতাঃ
- ৫। পেশাঃ (টিক ✓ দিন)
১) কৃষি
২) ব্যবসা
৩) চাকুরী
৪) অন্যান্য (উল্লেখ করুন)
- ৬। কিভাবে কোচাশহরে নীটওয়্যার শিল্পের উৎপত্তি হলো বলে আপনি মনে করেন/জানেন ?
- ৭। কি কি কারণে কোচা শহরে এই নীটওয়্যার শিল্পের বিকাশ ঘটল (টিক ✓ দিন উত্তর একাধিক হতে পারে)?
১) কম মজুরীতে সহজে শ্রমিক পাওয়া যায়
২) উন্নত রাস্তাঘাট
৩) কৃষিতে/অন্য কোন ক্ষেত্রে কর্মসংস্থানের সুযোগ না থাকা
৪) মহিমাগঞ্জ/কোচাশহর/ঢাকার সাথে উন্নত সড়ক পরিবহন ব্যবস্থা
৫) উত্তরাঞ্চলে শীতের প্রকোশ ও নিম্ন আয়ের মানুষের নিম্ন মানের গরম কাপড়ের চাহিদা
৬) নয়ারহাটে সোয়েটার মার্কেট এর বিকাশ
৭) অন্যান্য (লিখুন)ঃ
- ৮। এই শিল্পের পরিপূর্ণ বিকাশে কি কি বাধা আছে বলে আপনি মনে করেন ?
২)

৩)

৪)

৫)

৯। এই বাধা দূরীকরণে কি কি পদক্ষেপ নেওয়া যেতে পারে ?

১)

২)

৩)

৪)

১০। এ শিল্পের সুফলভোগী কারা?

১১। এই শিল্পের বিকাশে সমাজে কি কি প্রভাব সৃষ্টি হয়েছে ?

১২। আপনার অন্যান্য (যদি থাকে) মতামত দয়া করে লিপিবদ্ধ করুনঃ

বাংলাদেশ লোক-প্রশাসন প্রশিক্ষণ কেন্দ্র
সাভার, ঢাকা।

মেকানিকদের জন্য প্রণীত প্রশ্নপত্র

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তথ্য সংগ্রহকারীর নাম ও মোবাইল নংঃ

সাধারণ তথ্যাবলীঃ

- ১। নাম ও ঠিকানা মোবাইল নংঃ
গ্রামঃ ইউনিয়নঃ উপজেলাঃ
- ২। বয়স
- ৩। সর্বোচ্চ শিক্ষাগত যোগ্যতাঃ
- ৪। পরিবারের সদস্য সংখ্যাঃ
- ৫। কোন বছরে আপনি নিটিং মেশিন মেরামত ব্যবসা শুরু করেছেন?
- ৬। আপনি কোথা থেকে মেরামত কার্যক্রম শিখেছিলেন এবং কত বছর শিখতে হয়েছে ?
স্থানঃ বছরঃ
- ৭। নিটিং মেশিন মেরামত আপনার প্রধান পেশা কি না? (টিক ✓ দিন)
১) হ্যাঁ ২) না
- ৮। আপনার কোন কর্মচারী আছে ? (টিক ✓ দিন)
১) হ্যাঁ ২) না
- ৯। উত্তর হ্যাঁ হলে কতজন কর্মচারী আছে ?
- ১০। কিভাবে কোচাশহরে নীটওয়ার শিল্পের বিকাশ ঘটল বলে আপনি মনে করেন ? (টিক ✓ দিন)

- ১) কম মজুরীত সহজে শ্রমিক পাওয়া যায়
- ২) উন্নত রাস্তাঘাট
- ৩) কৃষিতে/অন্য কোন ক্ষেত্রে কর্মসংস্থানের সুযোগ না থাকা
- ৪) মহিমাগঞ্জ/কোচাশহর/ঢাকার সাথে উন্নত সড়ক পরিবহন ব্যবস্থা
- ৫) উত্তরাঞ্চলে শীতের প্রকোশ ও নিম্ন আয়ের মানুষের নিম্ন মানের গরম কাপড়ের চাহিদা
- ৬) নয়ারহাটে সোয়েটার মার্কেট এর বিকাশ
- ৭) অন্যান্য (লিখুন):

১১। এই শিল্পের পরিপূর্ণ বিকাশে কি কি বাধা আছে বলে আপনি মনে করেন ?

- ১)
- ২)
- ৩)
- ৪)
- ৬)

১২। এই বাধা দূরীকরণে কি কি পদক্ষেপ নেওয়া যেতে পারে ?

- ১)
- ২)
- ৩)
- ৪)
- ৫)

১৩। আপনার অন্যান্য (যদি থাকে) মতামত দয়া করে লিপিবদ্ধ করুনঃ

Annexure-G

বাংলাদেশ লোক-প্রশাসন প্রশিক্ষণ কেন্দ্র
সাভার, ঢাকা।

সূতা/সোয়েটার ব্যবসায়ীদের নিকট হতে তথ্য সংগ্রহের জন্য প্রণীত প্রশ্নপত্র

Project title: Determinants of a Successful Rural Industrial Cluster: The Case of the Sweater Industry in Gobindaganj Upazila of Gaibandha District, Bangladesh.

সাজাংকার গ্রহণের তারিখঃ

ID. No.

তথ্য সংগ্রহকারীর নাম ও মোবাইল নংঃ

সাধারণ তথ্যাবলীঃ

১। নাম ও ঠিকানা

গ্রামঃ

ইউনিয়নঃ

উপজেলাঃ

মোবাইল

নংঃ

২। বয়স

৩। সর্বোচ্চ শিড়গত যোগ্যতাঃ

৪। ব্যবসা শুরু বহরঃ

৫। পূর্বের পেশার বিবরণঃ (টিক √ দিন)

১) কৃষি

২) সুতা/সোয়েটার ব্যতীত অন্য ব্যবসা

৩) চাকুরী

৪) অন্যান্য

৬। সুতা/সোয়েটার ব্যবসা প্রধান পেশা কি না : (টিক √ দিন)

১) হ্যাঁ

২) না

৭। পরিবারের সদস্য সংখ্যাঃ

৮। আপনার নিয়োজিত কর্মচারীর সংখ্যা (যদি থাকে)ঃ

৯। আপনি খুরচা বিক্রেতা খুজতে : (টিক √ দিন)

১) নিজে বিভিন্ন শহরে গমন করেন

২) খুরচা বিক্রেতার সারসরি আপনার নিকট আসে

৩) উপরের দুটোই ঠিক

১০। নয়ারহাট/কোচাশহরে আপনার নিজের দোকান/শোরুম আছে কি? (টিক √ দিন)

১) হ্যাঁ

২) না

- ১১। শোরুম থাকলে কোন বছর থেকে চালু করেছেন?
- ১২। ব্যবসায়ী হিসাবে এ ব্যবসায় ভবিষ্যত সম্পর্কে আপনার মতামত
- ১৩। আপনি স্থানীয় সোয়েটার প্রস্তুতকারীদের সুতা/টাকা অগ্রীম প্রদান করে থাকেন কি? (টিক ✓ দিন)
- ১) হ্যাঁ ২) না
- ১৪। পণ্যের ডিজাইন আপনি সরবরাহ করেন কি? (টিক ✓ দিন)
- ১) হ্যাঁ ২) না ৩) মাঝে মাঝে
- ১৫। আপনার কোন সোয়েটার উৎপাদন প্রতিষ্ঠান আছে কি? (টিক ✓ দিন)
- ১) হ্যাঁ ২) না
- ১৬। এই শিল্পের উন্নয়নে এই এলাকাতে কি ধরনের প্রভাব পড়েছে?
- ১৭। এই শিল্পের উন্নয়নে প্রধান সমস্যাগুলো বলুন ?
- ১)
- ২)
- ৩)
- ১৮। কিভাবে এই সমস্যাগুলো দূর করা যায়?
- ১)
- ২)
- ৩)
- ১৯। আপনার অন্যান্য (যদি থাকে) মতামত দয়া করে লিপিবদ্ধ করুন ?