

Seminar Paper on
**Climate Change Adaptation and Rooftop
Gardening: A Study on Dhaka City**

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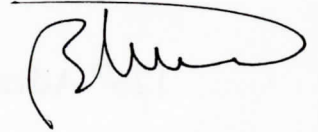


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To whom it may concern

This is to certify that Abu Sayed Md Fazla Alahi, Deputy Secretary, Ministry of Railways bearing roll number 119 of 126th Advanced Course on Administration and Development (ACAD) has prepared this seminar paper title on ,” Climate Change Adaptation and Rooftop Gardening: A Study on Dhaka City.” During the course starting from 21st July to 28th September 2019. He has done this seminar under my direct supervision for the partial fulfilment of the course. He has followed all my instructions during his work.

I wish him every success.



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ABSTRACTS

Dhaka is a over populated and rapid growing city in Bangladesh. The growth of population in this city is very high. To support increasing food demand of population, food supply should be secured. The production of fresh fruits, vegetables, spices, condiments and culinary herb of RTG can increase nutritional status of household members and it will make a positive contribution to climate change adaptation. The objectives of the study is to explore present status and challenges of RTG as well as to understand the impacts of climate change adaptability in Dhaka city. Mohammadpur and Dhanmondi have been selected as study areas. 20 RTG practitioners are interviewed by using semi-structured questionnaire. Project Director, UAPSP (Pilot), MAO, Mohammadpur and SAAO, Mohammadpur are interviewed as KII. Result shows that safe and fresh fruits and vegetables are produced in RTG and it support climate change adaptation in Dhaka city. Sustainable technology, lack of training , skill manpower and service provider unavailability were identified as major challenges. Finally some recommendations have been suggested to improve RTG practice and encourage more dwellers to practice rooftop garden in near future.

Keywords: Rooftop gardening, Urban agriculture, climate change adaptability.

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ACRONYM

ACAD : Advance Course on Administration and Development.

BARI : Bangladesh Agriculture Research Institute

BBS : Bangladesh Bureau of Statistics.

BPATC : Bangladesh Public Administration Training Centre.

DAE : Department of Agriculture Extension

DNCC : Dhaka North City Corporation

DSCC : Dhaka South City Corporation

MAO : Metropolitan Agriculture Office

RTG : Rooftop Garden

SAAO : Sub-Assistant Agricultural Officer

SRDI : Soil Resource Development Institute

UA : Urban Agriculture

UAPSP : Urban Agriculture Production Support Project

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INTRODUCTION AND LITERATURE REVIEW

Vegetation in a city is sometimes synonymous to presence of nature in the predominantly made environment. In the process of unplanned urbanization of the city, the vegetation coverage is decreasing day by day. Rapid urbanization creates massive demand on food in urban area supply system. Many cities in the world are struggling with the problem like rapid decrease in green space and increase in heat island effects. Urban agriculture or farming is promoted as a potential solution to these problems (Smit, Nasr & Ratta, 2001). There are many types of urban farming; roof farming is one type that does not directly compete for existing land use. Most roof space in urban areas is underutilized for auxiliary purposes beyond shelter. In most buildings, other than some space reserved for building maintenance and fire escape, much of the roof space is vacant. In this situation rooftop garden can be a potential alternative remedy to reverse the problem through applying this green technology on contemporary houses in the cities.

Historically Dhaka is one of the most densely populated cities in the world. Over last few decades, the trend is leading to loss of natural resources and habitat fragmentation (Barua and Ikbal, 2012). Dhaka, with an area of 306.38 sq km and population of 18.2 million has caused significant decline of green area, Open spaces, agricultural lands, wet lands and water bodies due to unplanned land use transformation (BBS 2014). Dhaka like many other big cities in the developing world are facing climate change impacts due to lack of proper planning and its organic growth.

As a result of urbanization the world's population becomes increasing in urban area. Urban sustainability is becoming more and more challenging in respect of fresh fruits and vegetables. Cities, in many countries of the world are at present quite unsustainable, using for more land and resources than they physically

encompasses (Wackernagel and Rees 1996). Dhaka city is also the same. As a result, urban areas are extremely decreasing global resources.

The global food system is one aspect of this problem, as agricultural lands worldwide are degraded to feed consumers thousands of kilometers away. As the food is produce locally, there is no need to travel far to get fresh foods which reduces use of fossil and consequently has a positive impact on the environment (Sprouting Good Urban Farming, Sydney, 2014). RTG could potentially reduce the environmental and economic costs of transport as well as increase supply fresh vegetables and fruits to city dwellers.

Therefore, roof gardens can actually save electricity and impact of climate change by reducing the cooling demand for comfortable condition. On the other hand rooftop gardening can be an effective method in ensuring year-round food supply and satisfying nutritional demands of the inhabitants of Dhaka city. These benefits are difficult to realize because the lands which have traditionally been used for agriculture within our urban areas are in high demand and vulnerable to development. As a result, rooftop gardening, in containers or on flat roofs has become an attractive possibility.

Rooftop gardening can be a possible solution to reduce the supply problems of fresh fruits and vegetables and make self-sufficient to fresh vegetables of urban individuals. It is estimated that 10,000 ha space of Dhaka city can be brought under rooftop farming and the residents of the city can test fresh vegetables as well as over 10 per cent of the demand can be fulfilled through rooftop gardening (Wardard 2014).

A study by Tabassum and Sharmin, 2010, found that less green space creates urban heat island effect due to more reflection of solar radiation and outdoor temperature of denser built up area in Dhaka is 1°C-1.5°C higher than the immediate urban zones with less green coverage and also can be higher at a range of 0.5°-1°C than the average meteorological record. This research also showed that indoor

temperature of residential buildings in less green covered neighborhoods rise at a range of 1°C-2°C thus creates thermal discomfort among occupants.

Samia Sharmin (2013) has conducted a case study on Green roof: an effective approach to achieve balance environment and thermal comfort in Dhaka. She found that green areas (like parks, gardens, vegetations, play fields) in cities and urban lands are being replaced with impervious surfaces which is creating urban environmental degradations. These green areas are one of the contributing factors in maintaining urban thermal environment and also responsible for creating urban ecosystem. It provides numerous environmental benefits by reducing urban heat island effect, storm water runoff, air temperature and solar radiation, providing air flow and maintaining air quality of the area and other economical and social benefits too.

However, as a consequence of increasing hard and impervious surfaces and filling up wet lands, storm water runoff, water logging and chances of flooding in Dhaka also have increased over the last decade. Even moderate rain causes a serious problem for certain areas, so parts of the city are inundated for several days (Tawhid, 2004).

During monsoon, average rainfall of Dhaka from 2000-2003 was counted by Meteorological department of Bangladesh (MDB) was 266 mm which is larger amount than many other cities, require proper drainage system and absorption by soil (Tawhid, 2004). In this situation, Dhaka needs immediate alternative solution to increase green surface to mitigate these environmental problems to ensure healthy urban living for inhabitants and to bring balance between green space and built up area in the city

Barua and Ikbali (2012) observed that, due to destruction of green spaces, balance of thermal comfort and environmentalism is being disturbed through high temperature, high humidity, air pollution, heat waves, rising sea level, water log off, floods, noise pollution, heat island effect etc.

Sajjaduzzaman (2005) reported that the major purpose of roof gardening are passing leisure time (100%), creating aesthetic values (100%), contributing in environmental amelioration (45%) and financial gain being a very minor concern (4% only) in Dhaka Metropolitan city of Bangladesh.

RESEARCH OBJECTIVES

The study focuses on the status of RTG and tries to find out the influencing factors to practice RTGs which can help to identify the effective policy measures for RTG that can become of a sustainable approach for urban agriculture for increasing supply of fresh fruits and vegetables of the city dwellers.

The specific objectives are stated below:

1. To study the present status of rooftop gardening in Dhaka city.
2. To identify the challenges of rooftop gardening in Dhaka city.
3. To understand the impacts of climate change adaptability in micro climate (RTG) in Dhaka city.

RESEARCH QUESTIONS

1. Is rooftop gardening in Dhaka city utilizing space effectively?
2. What contributing of rooftop gardening will help promote strong climate change adaptation technique?
3. What challenges are found in the present rooftop garden?

PROBLEM STATEMENT

Dhaka is the capital city of Bangladesh which is one of the largest city in the world. Here 18.2 million people live in an area 306.38 sq km (BBS, 2014). According to the eastern economic review, Dhaka will become a home of 25 million people by the year of 2025. One of the world's rapidly growing city is Dhaka, open and greenery land has been turn into built-up area indiscriminately and thus agricultural land has been decreased at an alarming rate (Islam & Ahmed 2011). With fast and discriminate urbanization, incidence of urban poverty and food security has been also increasing alarming in Dhaka (Choguill 1995). Urbanization creates massive demand on food in urban area supply system. Urban ecology is the direct victims of the decreasing greens contributing to some extend towards global warming. Many cities in the world are struggling with the problem like fast decrease in green and open space, reason of increasing heat island effects. Urban agriculture or farming is promoted as a potential solution to this problem (Smit, Nasr & Ratta, 2001). RTG can be used as a tool of strong climate change adaptation technique.

RATIONALE OF THE STUDY

Cities are continuously in transition of urbanization process due to accommodate increasing number of population, industrialization, economic and social changes. Dhaka, capital of Bangladesh and one of the fastest growing cities in the world is not an exception of this trend. In this urbanization process, Dhaka, increasing population in limited area has caused decline of green spaces, agricultural lands, wet lands and water bodies. Over last few decades, this trend is leading to loss of natural resources and habitat fragmentation (Barua and Ikbali, 2012). Due to this

rapid development, green areas and soft surfaces of cities, suburbs and communities are rapidly being grabbed by structures, roads, driveways, parking lots and other hard and impervious surfaces. In this aspect, one of proposed alternate to the current is establishment of rooftop garden more common to green roof agriculture. It provides numerous environmental benefits by reducing urban heat island effect, storm water runoff, air temperature and solar radiation, providing air flow and maintaining air quality of the area and other economical and social benefits too. Rooftop garden will also provide adulteration free fruits and vegetables for city dwellers.

CONCEPTUAL FRAMEWORK

Rooftop gardening is the production of fresh vegetables, herbs, fruits and flowers on rooftops for local consumption. Productive green roofs combine food production with ecological benefits, such as potential reduction of heating and cooling requirements (resulting in reduced emissions), biodiversity, improved aesthetic value and air quality.

The citizen of city areas aren't properly informed about rooftop gardening. The city dwellers are not aware of the advantage of rooftop gardening. Most of the people do not have technical knowledge on rooftop gardening (Safayet et. al, 2017). Trough training and other motivational activities increase house owner awareness level of rooftop gardening. Rooftop gardening can be a solution of safe fruits and vegetables supply problem as well as it will help promote strong climate change adaptation in Dhaka city. In this situation, Dhaka needs immediate alternative solution to increase green surface to mitigate these environmental problems to

ensure healthy urban living for inhabitants and to bring balance between green space and built up area in the city

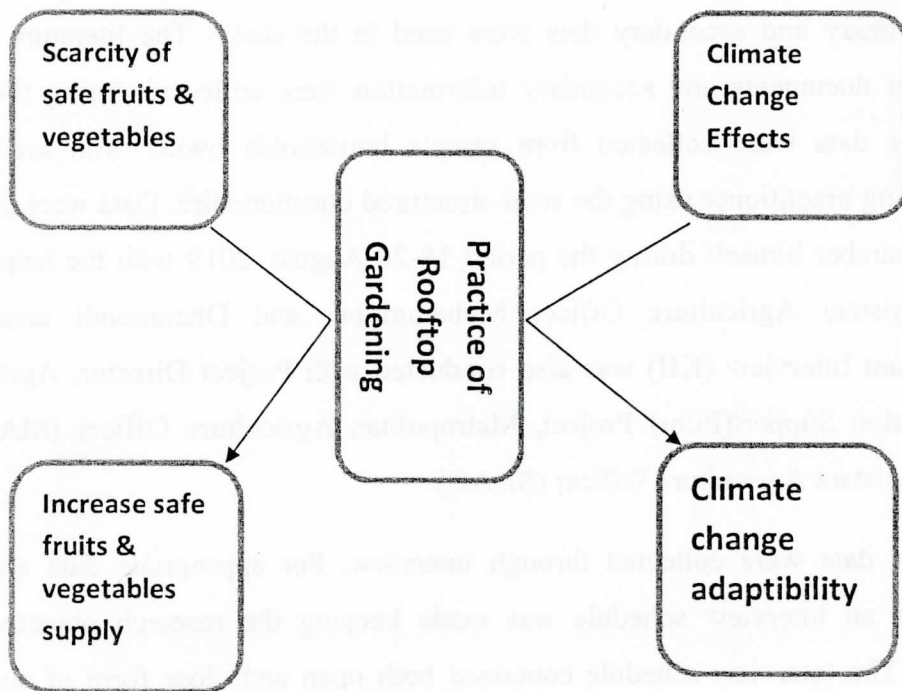


Fig: Conceptual Framework

METHODOLOGY

STUDY AREA

For ensuring proper representation of Dhaka city 2 metropolitan area Mohammadpur and Dhanmondi were selected after consulting with Metropolitan Agriculture Officer, Mohammadpur and Project Director, Urban Agricultural Production Support(Pilot) Project, Department of Agricultural Extension for study. This area has high density of building and existing of rooftop gardening practitioners.

DATA COLLECTION PROCEDURE

The primary and secondary data were used in the study. The literature review, relevant documents and secondary information were collected during the study. Primary data were collected from sample households owner who are rooftop gardening practitioner using the semi-structured questionnaire. Data were collected by researcher himself during the period 18-20 August, 2019 with the help of two Sub-assistant Agriculture Officer Mohammdpur and Dhanmondi areas. Key Informant Interview (KII) was also conducted with Project Director, Agricultural Production Support(Pilot) Project, Metropolitan Agriculture Officer (MAO) and Sub -assistant Agriculture Officer (SAAO).

Primary data were collected through interview. For appropriate data collection purpose an interview schedule was made keeping the research objectives and views. The interview schedule contained both open and close form of questions. Most of the questions were simple and direct. The draft schedule was prepared for data collection. Based on the previous experience necessary corrections and rearrangements were done in the schedule. Thus the schedule was prepare for final use.

Data were collected by the researcher himself during the period 18-20 August, 2019. Researcher tried to make all possible efforts to explain objectives of the study to the respondent house owners for collecting real data about RTG. Respondents were interviewed at their house. Before starting interview with the respondent, the researcher considered all possible measures to build up rapport with him or her so that he or she did not feel any hesitation to deliver exact response to the questions in the interview schedule. The questions were clarified to the respondent that any of them understand properly. The researcher always tried to avoid leading and multiple questions.

Data were sought on rooftop gardening like roof top size, uses of open space, yield of fruits and vegetables, income from RTG, input used, fruits and vegetables consumption, need of training and support assessment for rooftop gardening in the study area. Demographic and socio economic data were also collected from the respondents. All qualitative and quantitative data were collected in local terms and units and then converted into standard unit. In the case of calculating yearly household income from existing RTG, all sorts of income earned from RTG were taken into consideration with the perception of the interviewers. The primary data were collected from 18-20 August, 2019. Interviews were performed during daytime, with an average duration of about 30 minutes. Respondents were free to express their own view at each step of the interview.

DATA ANALYSIS AND FINDINGS

PRESENT STATUS OF ROOFTOP GARDENING IN DHAKA CITY

Basic socioeconomic characteristics of the respondents

Age of the respondents: Age of the respondents is an important factor that influences production decision and provides authentic information. In the study, the average age of the respondent was recorded as 54.4 years in all selected metro areas of Dhaka city.

Household size: Results revealed that the average size of household (family) of the respondent was recorded as 4.75 in selected metro areas of Dhaka city. The figure was found to be higher than national average (urban) of 4.41 BBS (2014).

Education: Education of the respondent can play a vital role in efficient management and operations as well as in successful production. An educated

person can have better access to the relevant technical and scientific information and can make judicious economic decisions. In the study, the education level of the respondents have been categorized into 4 (four) groups such as secondary, higher secondary, graduate and post-graduate. Results revealed that the average education level was recorded as the highest 55 per cent respondent was found as graduate and the lowest higher secondary level 15 per cent selected areas of Dhaka city.

Occupation: A good number of diversified respondents were involved in various occupations such as services (Govt. and private), business, housewife and retired. The highest 40 per cent respondents were found as business man followed by housewives (25%) and retired person (20%) irrespective both areas of Dhaka city. Rahman et al (2013) reported that the major income activities of rooftop gardeners were centered on government job (25.56%), while involvement in rooftop gardening by the retired employee was 17.3%.

Table:1 Average age, household size, educational level and occupation of the selected respondents

Average Age (year)	Average size of household			Education level(%)			Occupation (%)			
	Total	Male	Female	HSC	Graduate	Post-graduate	Service(ret.)	Service	Business	Housewife
54.4	4.75	2.45	2.35	15	55	30	20	15	40	25

Potential spaces of rooftop in the selected household

Potential space on rooftops is an utmost important for the garden in the city. In the study, results revealed that per household total rooftops space was recorded as 1910 sq. feet in study areas. Of them average 1590 sq. feet was considered as potential space for gardening and 320 sq. feet was remained as open but presently the open space are being used in different purposes by the owner of the building (table: 2).

Table: 2 Potential spaces of rooftop in the selected household

Size of space on rooftop per household			Used of open space as %	
Total space	Open space	Potential space for RTG	Drying cloths	Others
1910	320	1590	85	15

Vegetables and fruits produced in current RTG's in study area of Dhaka city

Different fruits and vegetables were found to be grown by the respondents. The green plants and flora in the house influence the feeling of harmony, simplicity and authenticity. Natural green has significant effect on overall life satisfaction and improve the occupants wellbeing Rashid et al. (2010). Bangladesh is blessed with many horticultural crops. More than 90 vegetables, 60 fruits and 25 spices are being grown in the country. But all types of fruits don't possible to produced on the rooftop. So species selection for roof gardening is an important task for every RTG practitioner. The species of fruits and vegetables are chosen in the city depending upon RTG practitioner food preferences, availability of seeds/sapling types that can

be grown on the rooftop. In the study, the following vegetables and fruits were produced in the existing rooftop garden in study areas. But the composition of fruits and vegetables are differed in each household significantly. However, the commonly produced fruits and vegetables in the current RTG in Dhaka city is shown in Table:3.

Table:3 Vegetables and fruits produced in current RTG’s in study area of Dhaka city

Fruits produced in RTG	Vegetables produced in RTG	
Guava	Brinjal	Bottle gourd
Mango	Chilli	Red amaranth
Lemon	Ladys finger	Stem amaranth
Malta	Country bean	Wax gourd
Papaya	Indian spinach	Coriander
Pummmelo	Capsicum	
Dragon fruit	Bitter gourd	
Strawberry	Lettuce	
Jujubee	Sweet gourd	

Fertilizer and pesticides used in RTG in selected area

The amount of fertilizer and pesticide to be applied depend on the nature of species and soil mixture. Uses of fertilizer and pesticides in the existing RTG was recorded as yes or no basis of the respondents in the selected areas. Results revealed that almost all respondents used fertilizer and pesticides in the rooftop garden. But they didn’t know the recommended packages of organic or chemical fertilizers for different container systems in rooftop gardening. Results revealed that about 45%

of the respondents used only organic fertilizer, 55% respondents used both organic or chemical fertilizers. On the other hand, about 65 per cent respondent used organic pesticides and 35% respondent used organic and chemical pesticides (Table:4).

Table: 4 Fertilizer and pesticides used in RTG in selected area

In % of respondents					
Fertilizer			Pesticides		
Organic	Organic +Chemical	Chemical	Organic	Organic +Chemical	Chemical
45	55	-	65	35	-

Production and income from RTG in selected areas

The average yield of vegetables and fruits was obtained for 10 common vegetables and fruits in the study. The yield data was converted into kilogram per household per year basis. Results revealed that the average yield of vegetables was found 235 Kg/RTG/Year. In case of fruits it was 120 Kg/RTG/Year. In the study reported that per household meet 35% demand of fruits and vegetables from RTG.

Table : 5 Production and income from RTG in selected areas

Production(Kg/RTG/Year)		Income(Tk//RTG/Year)		In % of fruits and vegetables need meet by RTG of respondent family
Fruits	Vegetables	Fruits	Vegetables	
120	235	6000	4700	23

Responses to the benefits of RTG by respondents

Some benefits aren't possible to estimate such as the energy savings due to the insulation provided by the soil and vegetation of a green roof, many benefits are not readily measurable and their values are difficult to estimate such as the health benefits of a rooftop garden. In the study, six types of common benefits were derived by the respondent opinions and these are shown in the Table: 6.

Table: 6 Responses to the benefits of RTG by respondents

In % of respondents reported to the benefits of RTG				
Economic support	Ensure safe vegetables & fruits	Increase nutritional value	Environmental benefit	Increase social status
100	100	75	100	65

Responses to need support from extension personnel

A particular question was throwing to the respondents for getting their responses on the support needed from the DAE and BARI for RTG. The types of support derived from interview were classified into 4 (four) categories such as (i) technical support (ii) input support (iii) training support and (iv) monitoring through regular visit. The highest 75% of the respondents claim that they needed technical support followed by monitoring through regular visit (65%) support (70%), training (60%) and input support (55%) in both areas of Dhaka city (Table: 7).

Table:7 Responses to need support from extension personnel

In % of respondents			
Technical	Input support	Training	Regular visit
75	55	60	65

CLIMATE CHANGE ADAPTABILITY BY ROOFTOP GARDEN

Many benefits aren't possible to measure their values and difficult to estimate such as the health benefits of a rooftop gardening and energy savings due to the insulation provided by the soil and vegetation of a green roof. In the study, a particular question regards to climate change adaptability was throwing to the respondents. Three types of common benefits were derived by the respondent

opinions and these are shown in the Table: 9. The types of benefits derived from interview were classified into 3 (three) categories such as Remain cool during hot day, Shelter of birds and Balance environment. The highest 100% of the respondents opine that RTG can play vital role to make balance environment. Key Informant Mr. Taherul Islam, PD, UAPS (Pilot), Khamarbari, Dhaka stated that RTG keep the building remain cool during summer season. A study by Tabassum and Sharmin, 2010, found that less green space creates urban heat island effect due to more reflection of solar radiation and outdoor temperature of denser built up area in Dhaka is 1°C-1.5°C higher than the immediate urban zones with less green coverage and also can be higher at a range of 0.5°-1°C than the average meteorological record. This research also showed that indoor temperature of residential buildings in less green covered neighborhoods rise at a range of 1°C-2°C thus creates thermal discomfort among occupants.

Table:9 Impact of climate change adaptability

In % of respondents reported to climate change adaptability of RTG		
Remain cool during hot day	Shelter of birds	Balance environment
65	35	100

CHALLENGES ARE FOUND IN PRESENT ROOFTOP GARDEN

A particular question was throwing to the respondents for getting their responses on challenges to establishing or improving of RTG. The types of challenges derived from interview were classified into 6 (six) categories such as (1) Technology, (2) Input, (3) Finance, (4) Manpower/Gardener, (5) Training and (6) Service provider.

The highest 80% of the respondents informed that they had faced problem to deployed right person for RTG. On the other hand, maximum respondents opined that they had faced problem technical (75%) and input (55%) support for RTG followed by training (60%). In case of service provider 65% respondents opine that they needed. Key Informant Mr. Taherul Islam, PD, UAPS(Pilot), DAE, Khamarbari, Dhaka stated that Service provider (include DAE/research/NGO's personal, nursery man, fertilizer/seed dealer, container seller etc.) can play an important role for supplying necessary materials and technical support to the RTG practitioners in time.

Table: 8 Challenges of RTG improvement and implementation in selected area

In % of respondents					
Technology	Input	Finance	Manpower (Gardener/Labour)	Training	Service provider
75	55	40	80	60	65

IMPLICATION AND RECOMENDATIONS

Increase greenery within cities is now established as tools of improving air quality. Green roofs would play an important role in reducing urban temperatures, and subsequent improvements in air pollution. Rooftop gardening also plays an important role on climate change adaptation in city areas. The production of fresh fruits and vegetables of the rooftop garden can be increased nutritional status of household members of the urban citizens. The city dwellers can get benefits from natural greenery by visual and physical contacts. These include both mental benefits and physical benefits. Most of the rooftops of city area is flat and suitable

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for gardening and maximum government and commercial office buildings rooftop are not under use. But it can be used for rooftop gardening. Climate is suitable for urban agriculture particularly rooftop gardening in the city area. Available fruits and vegetables variety developed by BARI, many of them are suitable for rooftop gardening. Key Informant Mr. Taherul Islam, PD, UAPS(Pilot), DAE, Khamarbari, Dhaka stated that BARI mango-4, BARI mango-11, BARI malta-1 and BARI brinjal would be suitable for RTG.

On the basis of findings generated through RTG practitioner interview and Key Informant Interview to overcome the challenges of improve RTG practice to make adaptation against climate change in Dhaka city, this study recommends:

- Political commitment, policy guidelines and people awareness are the preconditions for creating favourable environment for RTG
- Utilization of the unused or potential space on rooftop for fresh food production would be an ideal option;
- Plant composition at the current RTG's can be justified as an economic point of view and capacity of the roof.
- Crop diversity can be enhanced by introducing high yielding variety of vegetables and fruits developed by BARI and other relevant organizations.
- Yield of vegetables and fruits in the current RTG's could be increased through proper management and ensuring regular visit by the respective service provider or DAE personal.
- Training on modern and sustainable technology of RTG is essential for the rooftop gardeners.
- Strengthening linkage between RTG owner and service provider (SP) in the respective location.
- Building regulations have to be changed that take into consideration the weight of RTG in the construction.

- Finally, a technically feasible, socially acceptable, economically viable and environment friendly RTG model should be developed and up-scaling gradually in city areas.

CONCLUSIONS

Rooftop gardening contributes to creation of healthy environment and food security. Population of Dhaka city is increasing rapidly and demand of fresh fruits and vegetables are also increasing. But lack of land utilization policy, agricultural land is turn into residential, commercial or industrial uses. So that it decreases the possibility to grow more different vegetables and fruits for city dwellers. On the other hand food adulteration occurs by harmful chemical usage at production and post harvest stage is increasing. In this circumstances, practice of rooftop gardening make a potential and possible solution. It increases supply of fresh and safe food products, creation healthy environment by improving air quality and absorbing carbon di oxide gas from air and mitigation the impact of climate changes. The Government of Bangladesh does not have enough policies or legal framework that promotes urban agriculture in regarding rooftop gardening in particular for Dhaka city. There is no specific policy of City Corporation that promotes RTG in Dhaka. Recently Department of Agricultural Extension and Soil Resource Development Institute under Ministry of Agriculture has taken a pilot project (UAPSP) for established RTG in DNCC, DSCC and Savar Pourasava area. DAE and SRDI also provide training program for house owner who has potential space for RTG. But this is not sufficient to extension the practice of rooftop gardening in Dhaka city. The Government guidance and encouragement is urgently needed to expand the RTG. This study basically focus on present status of rooftop gardening, associate challenges and climate change adaptability in Dhaka city. The findings of the study, take further research regarding this issue for technically possible, socially acceptable, economically viable and environment friendly RTG model can be developed .

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