

**INVOLVEMENT OF FARM WOMEN IN POST-HARVEST  
PRACTICES OF VEGETABLES**

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***INVOLVEMENT OF FARM WOMEN IN POST-HARVEST  
PRACTICES OF VEGETABLES***

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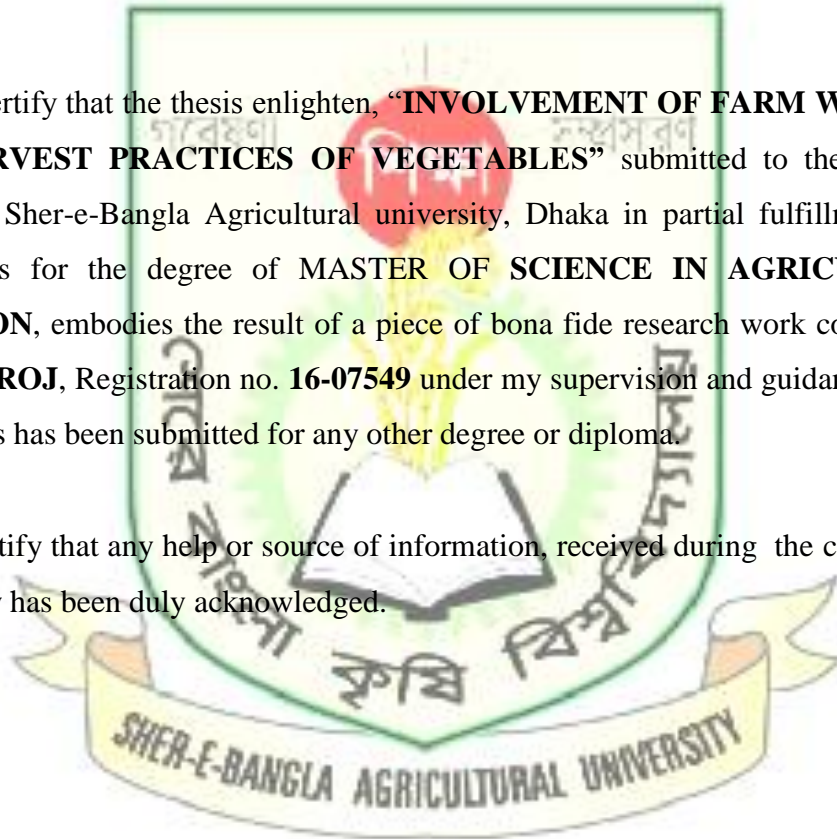
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This is to certify that the thesis enlighten, “**INVOLVEMENT OF FARM WOMEN IN POST-HARVEST PRACTICES OF VEGETABLES**” submitted to the faculty of agriculture, Sher-e-Bangla Agricultural university, Dhaka in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE IN AGRICULTURAL EXTENSION**, embodies the result of a piece of bona fide research work conducted by **SADIA AFROJ**, Registration no. **16-07549** under my supervision and guidance. No part of this thesis has been submitted for any other degree or diploma.

I further certify that any help or source of information, received during the course of this study has been duly acknowledged.



Dated: June, 2017  
Dhaka, Bangladesh

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**Dedicated To**

*My Beloved Parents*

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**The Author**

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## **ABBREVIATIONS USED**

FAO	Food and Agriculture Organization
DAE	Department of Agricultural Extension
PHT	Post-Harvest Technologies
IGAs	Income Generating Activities
SPSS	Statistical Package for Social Science

# **INVOLVEMENT OF FARM WOMEN IN POST-HARVEST PRACTICES OF VEGETABLES**

BY

SADIA AFROJ

## **ABSTRACT**

The objectives of this study were to describe the selected characteristics of the farm women and to determine their level of involvement in post-harvest practices of vegetables. Attempt also made to determine the significant contribution of farm women involvement in post-harvest practices of vegetables. The study was conducted at two villages of Ruhitpur union of Keranigonj upazila under Dhaka district. Data were collected by using interview schedule from the randomly selected 106 respondents during 15th January to 13th February, 2018. Descriptive statistics, multiple regressions ( $\beta$ ) were used for analysis. Majority (38.7 percent) of the respondents had low involvement of farm women while 33.0 percent and 28.3 percent of them had medium and high involvement in post-harvest practices of vegetables respectively. Among ten selected characteristics, age, education, cosmopolitaness and knowledge on post-harvest practices of vegetables had significant positive contribution to the involvement of farm women in post-harvest practices of vegetables. The remaining characteristics of the farmers, namely family labour, land under vegetable cultivation, annual family income from vegetable cultivation, use of information sources, commercialization of vegetable and types of vegetables did not show any significant contribution with their involvement. The findings of the study indicated that involvement of farm women in post-harvest practices of vegetables was not found satisfactory.





# CHAPTER I

## INTRODUCTION

### 1.1 Background of the Study

Diversification of vegetable crops and their commercialization can support positively the development of agricultural crops in several ways. Although vegetables are cultivated in only 1.8 percent of the total cultivable land, the premises of houses, tin sheds and roof tops can be used for vegetable cultivation. In some areas of Bangladesh, vegetables are also cultivated on floating systems. Almost 20-25 varieties of vegetables, including tomato, bottle gourd and cauliflower, are produced year-round. By using improved varieties and modern technologies 30 percent more vegetables can be produced in the country. According to FAO, vegetable production has increased five times in the past 40 years. Bangladesh has scored 3rd in global vegetable production, next to China and India. The farmers are getting a considerable profit from vegetable production which is changing their life. Literate youths are joining the industry and are achieving targets with the use of improved technology and their talents. The land under vegetable cultivation in the country has increased at the rate of 5.0 per cent in the last decade. The rate of increase of vegetable production was 6.0 per cent in the last three years. Land under vegetable cultivation during the current Rabi season has been set at 528 thousand hectares. Every year 10 million MT of potato is produced of which 100 thousand MT are exported abroad (FAO, 2009).

Vegetable and fruits are now exported to about 50 countries around the world. Sixty percent of the total quantity is exported to the Middle East and the remaining 40 percent to European and other countries. The exported vegetables include yard-long bean, cowpea, cucumber, snake gourd, bitter melon, tomatoes, papaya, eggplant, pumpkin, lady's finger, pumpkin, amaranth, spinach, Indian spinach, cauliflower, cabbage, green chilies, taro, coco yam, green papaya, plantain, jute leaf, bottle gourd leaf, arum leaf, water lily, mustard green, bean seed, jackfruit seed, aroid, etc. To increase earnings from export, the government has taken initiatives to export salmonella-free betel leaf and bacteria-free vegetables. The demand for Bangladeshi vegetables is increasing in the South Asian sub-continent and the Gulf region day by day.

Postharvest practices is the stage of crop production immediately following harvest, including cooling, cleaning, sorting and packing. The instant a crop is removed from the ground, or separated from its parent plant, it begins to deteriorate. Postharvest treatment largely determines final quality, whether a crop is sold for fresh consumption, or used as an ingredient in a processed food product. The most important goals of post-harvest handling are keeping the undesirable chemical changes, and avoiding physical damage such as bruising, to delay spoilage. Sanitation is also an important factor, to reduce the possibility of pathogens that could be carried by fresh produce, for example, as residue from contaminated washing water (Bachmann and Earles. 2000).

After the field, post-harvest practices is usually continued in a packing house. This can be a simple shed, providing shade and running water, or a large-scale, sophisticated, mechanised facility, with conveyor belts, automated sorting and packing stations, walk-in coolers and the like. In mechanised harvesting, processing may also begin as part of the actual harvest process, with initial cleaning and sorting performed by the harvesting machinery. Initial post-harvest storage conditions are critical to maintaining quality. Each crop has an optimum range of storage temperature and humidity. Also, certain crops cannot be effectively stored together, as unwanted chemical interactions can result. Various methods of high-speed cooling, and sophisticated refrigerated and atmosphere-controlled environments, are employed to prolong freshness, particularly in large-scale operations (Bachmann and Earles. 2000).

Once harvested, vegetables and fruits are subject to the active process of senescence. Numerous biochemical processes continuously change the original composition of the crop until it becomes unmarketable. The period during which consumption is considered acceptable is defined as the time of "postharvest shelf life". Postharvest shelf life is typically determined by objective methods that determine the overall appearance, taste flavour, and texture of the commodity.

The contributions of rural women in Bangladesh are largely unorganized. They are very well contributors to agricultural and economic production along with household activities. Womens participation in rural development, more particularly in agricultural development in Bangladesh are the most important strategy designed to improve the social and economic life of specific group of farming community. In the existing

socioeconomic condition of the country, activities of most of the rural woman are confined to the homestead where they are involved mostly in the household and agricultural activities. Farm women play an important role in post harvest activities especially in threshing, cleaning, washing, drying and storage of grains & vegetables in all the zones proving that they were a major role contributor to the family food and economic security (Nazli and Hamid, 2007 and Sindhu, 2007).

Farm women are responsible for the more time-consuming and labour-intensive tasks of crop and livestock production: sowing, application of fertilizer, weeding, harvesting, transporting, threshing, winnowing, cleaning, sorting grading and bagging. These tasks are carried out manually or with simple tools. It is most unfortunate that the role of farm women and their contribution in farm activities are yet to be recognized.

## **1.2 Justification of the Study**

The overall development of the country is impossible without massive involvement of rural people specially rural women in income generating activities (IGAs). Though Bangladesh is an over populated country and its land resources are limited. However, food demand is increasing day by day though its land can not be increased. So, if we want maximum output from these limited resources, people will have to utilize these resources in its highest potentials. In order to meet up increasing food demand of people, it is important to minimize post harvest loss of cultivated produce. The post-harvest practices of fruits and vegetables scenario are quiet unsatisfactory and mostly comprise of traditional techniques practiced by the growers, traders and processors, owing to which considerable deterioration in physical and nutritional qualities of the harvested in Bangladesh. It is estimated that the post-harvest loss of fruits and vegetables in the country is about 25-35% (Mia and *et al*, 2008). Again food safety is essential for the health and well-being of consumers, while food quality is for their satisfaction and nutrition. If quality and safety are to be guaranteed, good practices must be employed from growing, harvesting and postharvest handling of foods, to the processing, packaging and distribution and during storage and preparation before consumption (FAO 1996). This has become imperative because foodstuffs undergo progressive deterioration in quality and safety often harvested, gathered, caught or slaughtered with microbes such as bacteria, yeasts, moulds, insects and rodents.

Farm women can play vital role in post harvest activities of vegetables and fruits. Use of appropriate post harvest technology reduces the post harvest and storage losses, adds value to the product, generate employment in village and reestablishes agro-industries in rural sector (Bachmann and Earles, 2000). The problem of post harvest losses of vegetables is critical. Inadequate knowledge about post harvest handling and storing of vegetables is also responsible for this loss. Farm women play an important role in post harvest activities especially in threshing, cleaning, washing, drying and storage etc. But they do not have appropriate knowledge about post harvest practices. To achieve this goal an effective extension program is needed for speedy dissemination of information to the respondents. Before taking such program it is necessary to have clear understanding about their existing practice and knowledge regarding involvement in the post harvest processing of vegetables. Hence, the present study “involvement of farm women in post harvest practices of vegetables” has been undertaken.

### **1.3 Statement of the Problem**

Rural (farm) women of Bangladesh play significant role in post harvest activities of vegetables. However, women are the disadvantaged class of the society. Participation of women is of crucial importance for the success of any development programme. Vegetables are most important in daily human diet for its nutritional value. The participation of farm women in post harvest activities of vegetables is expected to improve their livelihoods by increasing their access to and control over resources. But due to lack of adequate knowledge and skills towards the new technology, they are not able to participate in post harvest activities of vegetables. Technology is continuously changing. Much skill is needed for use of the technologies by women in post harvest activities of vegetables.

With a view to conduct an investigation on various aspects of Post harvest practices of vegetables, the researcher undertook this piece of study entitled “Involvement of farm women in post harvest practices of vegetables”. The main purpose of the study was to determine involvement of farm women in post harvest practices of selected vegetables and to ascertain the contribution of the selected characteristics of the farm women to their involvement on post harvest practices of vegetables. However, the study attempts to find out the answers to the following questions:

1. What are the characteristics of the farm women ?
2. To what extent of involvement of farm women in post harvest practices of vegetables?
3. What are the factors influencing the involvement of farm women in post harvest practices of vegetables ?

#### **1.4 Specific Objectives**

In view of the problems as stated above, the following specific objectives were set to give an appropriate track to the research work-

1. To describe the following selected characteristics of the farm women:
  - a) Age
  - b) Level of education
  - c) Family labour
  - d) Land under vegetables cultivation
  - e) Annual income from vegetables
  - f) Cosmopolitaness
  - g) Use of information sources
  - h) Knowledge on post harvest processing
  - i) Commercialization of vegetable
  - j) Number of vegetables grown
2. To determine the level of involvement of farm women in post harvest practices of vegetables.
3. To identify the factors influencing the involvement of farm women in post harvest practices of vegetables.

#### **1.4 Scope and Limitations of the Study**

The findings of the study will, in particular, be applicable to selected two villages namely, Mugarchar and Lakhirchar of Ruhitpur union in Keranigonj upazila under Dhaka district. However, the findings may also be applicable to other areas of Bangladesh where the physical, socio-economic, cultural and geographic conditions do not differ much from those of the study area. Thus, the findings are expected to be useful

to the students, researchers, extension specialists and particularly for planners in formulating and redesigning extension programmes. The findings may be a piece of contribution to the body of knowledge in the field of agricultural development.

Considering time, money and other resources and also to make the study meaningful and manageable, the researcher had to impose certain limitations as mentioned below:

The study was confined to a selected area i.e. two villages of Keranigonj upazila under Dhaka District.

- There were many farm women in Ruhitpur union but only 106 respondents who involved in post harvest practices of vegetables were considered for this study.
- Only 5 activities and 7 vegetables were selected for measuring extent of involvement.
- Only the housewives of male headed family were considered as respondents of the study.
- There were many characteristics of the housewives but only nine of them were selected for this study.
- The researcher had to depend on the data furnished by the selected respondents.

### **1.5 Assumptions of the study**

An assumption is the supposition that an apparent fact or principle is true in the light of available evidence (Gode,1945). The researcher had the following assumptions in mind while undertaking this study :

- The respondent farm women of the study area were capable of furnishing adequate information, views and options.
- The responses furnished by the respondent were valid and reliable.
- Information furnished by the respondents included in the sample were the representative of the whole population of the study.

- The researcher personally collected data was well adjusted herself to the social environment of the study area. Hence the data collected from the respondents were free from any biasness and with no hesitation.

## **1.7 Definition of the Terms**

### **Involvement:**

Involvement referred to the extent of participation in post harvest practices by the farm women during the years preceeding the interview.

### **Post harvest practices:**

In agriculture, postharvest practices refers to the stage of crop production immediately following harvest, including cooling, curing, sorting, grading, handling, storage, processing, wrapping, packaging. The instant a crop is removed from the ground, or separated from its parent plant, it begins to deteriorate.

### **Farm women:**

Farm women refers to the women who are direct or indirectly engaged in farm / agricultural activities.

### **Vegetables:**

Vegetable refers to the edible part of the plant (roots/tubers, stems, leaves, etc) which are eaten as cooked food and green salad.

### **Number of vegetables:**

In this study, number of vegetables refers to the number of vegetables cultivated by the farmers in a year. In this study vegetables are cabbage, cauliflower, raddish, bottle gourd, red amaranth, yardlong bean and pumpkin.

**Family labour:**

Family labour refers to the members who are involved in post harvest activities in a family.

**Commercialization of vegetable:**

Commercialization of vegetable referred to the ratio of value of vegetable sold and total value of vegetable raised. It was expressed in percentage.

**Post harvest Shelf life:**

The period during which consumption is considered acceptable is defined as the time of postharvest shelf life.



## **CHAPTER II**

### **REVIEW OF LITERATURE**

The present study is concerned with the involvement of farm women in post harvest practices of vegetables. This review of literature chapter deals with the review of past studies and findings related to study. The researcher came across with some expert opinions and has tried his best to collect needful information through searching relevant studies, journals, periodicals, bulletins, leaflets, internet etc. These enhanced the researcher's knowledge for better and clear understanding of the present study. This chapter has been presented in four sections as follows:

Section 1: Vegetable Production Scenario in Bangladesh

Section 2: General Findings on Post Harvest Practices of Vegetables

Section 3: The Relationship between Women's Characteristics and Their Involvement in Various Farm Activities

Section 4: The Conceptual Framework of the Study

#### **2.1 Vegetable Production Scenario in Bangladesh**

Weinberger and Genova II (2005) stated that more than 60 types of vegetables of indigenous and exotic origin are grown in Bangladesh. Based on the growing season, vegetables are categorized as summer/rainy season vegetables, winter season vegetables, and all-season vegetables. Of the summer vegetables, various cucurbits, vegetable cowpea, hyacinth bean, stem amaranth, several aroids and Indian spinach are predominant. Winter vegetables include tomato, cabbage, Chinese cabbage, cauliflower, eggplant, carrot, spinach, bottle gourd, bush bean and radish. Crops like okra, heat-tolerant tomato, eggplant, carrot, spinach, many leafy vegetables and small onion are grown all year round. Summer vegetables are cultivated during the monsoon season from May to October. On the other hand, winter vegetables are grown from November to April. The production of vegetables is higher during winter (60 to 70%) and most districts produce marketable surplus during that season.

Department of Agricultural Extension (DAE) has informed that in the fiscal year of 2015-16, the government has set target the production of 143,47,000 Metric tons of vegetable from the 8.05 lakh hector cultivable land. DAE source further said right now more than 150 types of vegetables are being cultivated in Bangladesh.

According to scientists, vegetables are cultivated in only 1.8 per cent of the total cultivatable land. Besides this, the premises of houses, tin sheds and roof tops are used for vegetable cultivation. In some areas vegetables are also cultivated on floating systems. Almost 20-25 varieties of vegetables, including tomato, bottle gourd and cauliflower, are produced year-round. By using improved varieties and modern technologies 30 percent more vegetables can be produced in the country.

Karim et al.(2005) observed that the vegetable sector, occupying a more or less significant position in our export sector, helps meet our need of foreign currency as well as ensure our economic development. Bangladesh earns Tk. 1456.33 million (US\$ 24.70 million) in the year 2003-04 by exporting vegetables, which constitutes 60.08 percent of the earnings from agricultural products.

Shin (2001) found that vegetables in much of Asia and the Pacific region are grown by small-scale farmers who are unorganized and scattered in different locations and this also applies to Bangladesh.

Siskos et al. (2001) stated that concentration on production is important because low production can affect all the players in agribusiness. At the production level, external factors such as weather and susceptibility to diseases and pests have significant effects on the output and quality of agricultural produce.

According to the Hortex Foundation estimation (2005), the area under vegetable cultivation accounts for only 1.79 percent of the total cropped areas. From this small proportion of the land area, Bangladesh produces about 1.63 million metric tons of vegetables annually, of which about 60 percent are produced in winter and the rest in summer. Therefore, production is not well distributed throughout the year and produce for domestic use is relatively scarce in the off-season.

Hortex Foundation (2005) reported that most of the agricultural production in Bangladesh is concentrated in rice, occupying about 75 percent of total cropped areas (Government of Bangladesh, 1999), whereas only seven percent of the total cropped land is used for horticulture crops, including root and tuber crops.

Weinberger and Lumpkin (2005) found that farmers who are engaged in the production of vegetables often earn higher incomes than those engaged in the production of cereal crops alone.

Ali (2000) observed that for Bangladesh, identifying the constraints on the expansion of vegetables production is important, since the supply of vegetables is quite irregular in most Asian countries, including Bangladesh.

Hossain (2004) reported that export volumes for fruit and vegetable products, though modest in relative terms (about US\$ 16.5 million in 2002), have been rising rapidly in the recent past (export volumes in 2000 were five times those of 1990). Fresh fruits and vegetables are mostly exported through members of the Bangladesh Fruits, Vegetables and Allied Products Exporters' Association. The Association had a total of 252 members in 2001, approximately 25 of whom are reportedly active in exporting activities.

Quasem (2003) found that main crops exported are yardlong bean, taro, and several gourds (teasle gourd, bitter gourd, bottle gourd, ridged gourd, and white gourd). Most exports are destined to the United Kingdom and the Middle East (United Arab Emirates, Saudi Arabia, Qatar, Kuwait and Oman), all countries with a large population of Bangladeshi migrant workers.

## **2.2 General Findings on Post Harvest Practices of Vegetables**

Post harvest technology is inter-disciplinary “Science and Technology” applied to agricultural produce after harvest for its protection, conservation, processing, packaging, distribution, marketing and utilization to meet the food and nutritional requirements of the people in relation to their needs. It has to be developed in consonance with the needs of each society to stimulate agricultural production; prevent post-harvest losses, improve nutrition and add value to the products.

Krumbein and Peters (2003) experimented on changes of aroma volatiles in tomato in postharvest. To ensure good flavor, it is recommended that harvesting take place at the red ripening stage. During a 10-day post-harvest period under retail and home conditions, 12 aroma volatiles and the titratable acid were found to have changed significantly in the cherry tomato Mickey when harvested at the red ripening stage. The changes detected in the flavor substances during the post harvest period are expected to produce differences in the sensory qualities of the tomato.

Swagatam et al. (2004) studied on prepackaging, storage losses and physiological changes of fresh bitter melon as influenced by post harvest treatments. Bitter melons (*Momordica charantia*) were collected immediately after harvest, transferred to the laboratory and subjected to different pre-packaging post harvest handling treatments, consisting of (1) control; (2) perforated polyethylene bag, (3) unperforated polyethylene bag, (4) wet gunny bag, (5) polyester bag and (6) splashing of water. The physical appearance of bitter melon (colour and degree of shrinkage) at 6 days after storage (DAS) was better in perforated polyethylene and wet gunny bags.

Khatri (2013) in her study stated that majority of the respondents were not involved in processing either at domestic or commercial level this was due to the lack of knowledge regarding this aspect.

Amin et al. (2009) studied ‘Participation level of rural women regarding post-harvesting activities in Pakistan’ and reported that most of the activities related to take the crop to the market and mills were performed by the husbands (67.97%) with limited participation in food preservation and processing whereas, the wives were mainly

involved in cleaning of store rooms, storage of agricultural products in bags and preparation of marmalades and pickles. The participation of women was very high in storage, drying, packaging of grains and low in marketing.

In Bangladesh, Paul and Saadullah (1991) reported that families without women are not sustainable and women are responsible in 90% post harvest activities. They further reported the role of women in homestead and family life.

Pal (2001) reported in Bangladesh rural women have played important roles in wide range of income generating activities. These rural production activities include post-harvesting.

Nazli and Hamid (2007) and Sindhu (2007) stated that rural women played an important role in post harvest activities especially in drying, storage and cleaning of grains in all the zones proving that they were a major role contributor to the family food and economic security.

Dawn (2004) found that in Pakistan, rural women provide most of the labour for post harvest activities, taking responsibilities for storage, handling, stocking, processing and marketing.

Begum (2002) reported that the division of labor by sex in Bangladesh indicates that women perform all (100%) of domestic work, 80% of processing and storing crops, 60% of weeding, 80% of harvesting, 80% caring for livestock and 55% of planting works in agriculture sector of the country.

Naher (2000) found that most of the rural women participated in each of the four selected homestead activities such as 62% in post harvest activities, 54% in poultry rearing, 47% in goat rearing and 40% in case of homestead vegetable cultivation. Their extent of participation was also high.

Supekar (2002) mentioned that to enable women to undertake the agricultural or other income-generating programs, it is very essential that specific need based training courses are to be prepared and conducted. These training programs shall include inter cropping

management patterns, agro-processing and preservation, marketing, packaging, advertisement for entrepreneurship development, seed collection and selection, nursery activities, forestry, appropriate low-cost technology, organic farming etc.

Verma et al. (1992) stated that in India, women have a crucial role to play in post harvest technology particularly in areas related to winnowing and storage of grains. However, little attention has been paid to food losses. It is suggested that proper handling and management needs to be taught systematically to rural women. A study of needs of training in PHT (Post Harvest Technologies) for farm women was launched which covered the involvement of women in operations, the effectiveness of the messages on PHT transmitted in terms of knowledge gain and associated factors influencing knowledge acquisition and attitudinal change. That study was undertaken to examine women's role in PHT and the results inferred that the message of PHT can be transmitted effectively without any consideration for age, caste, education or family type, implying that need based training can overcome the barriers of personal factors or limitations. PHT is, therefore, relevant to farm women irrespective of their personal profile variables.

Anonymous (2005) reported that a high percentage of independent participation by women (43-81%) in all homestead activities like cooking, cleaning, collection of full fetching water, care of children and elderly etc. Independent participation of women in major crop production, post harvest (2%), livestock management (6%) and entrepreneurial activities was nil. It is interesting to note that independent decision making by women on all home and family related practices was very marginal (6.9-13%) even though home and family is essentially a women's domain.

## **2.3 The Relationship between Women's Characteristics and Their Involvement in Various Farm Activities**

### **2.3.1 Age and involvement**

Akhter (2007) in her study found that the age of rural women had no relationship with their participation in homestead waste management towards integrated plant nutrient system. Similar findings were observed by Islam (2007) and Amin (2004) in their respective studies.

Aktaruzzaman (2006) mentioned that there was a significant positive relationship between age of landless women and their functional participation in income generating activities (IGAs).

Hasan (2006) mentioned that there was no significant relationship between age of the conventional and organic farmers with their extent of participation in farming activities.

Aziz (2004) found that age of tribal had no significant relationship with their participation in homestead agriculture.

Khatun (2004) in her study that there was no significant relationship between age of the rural women and their participation in homestead management activities.

Salahuddin (2003) in his study found that the age of rural women had significant negative relationship with their involvement in homestead vegetable production.

Islam (2002) in his study found that, age of the women had no significant relationship with their involvement in income generating activities.

Aurangozeb (2002) found that age of the rural women had significant relationship with their adoption of integrated homestead farming technologies.

Chowdhury (2000) in his study observed that age of the rural women had insignificant relationship with their opinion for participation in development activities.

Akhter (2000) in his study found that the age had positive significant relationship with their participation in agriculture, fisheries and poultry programs of BAUEC.

### **2.3.2 Education and involvement**

Haque (2008) revealed that education was significantly related with the respondents' participation in alternative livelihood activities.

Rahman (2008) mentioned that education showed significant positive relationships with respondents' participation in biodiversity management activities.

Akher (2007) found in her study and mentioned that education of rural women had a significant positive relationship with their participation in homestead waste management towards integrated plant nutrient system.

Aktaruzzaman (2006) revealed that there was non-significant relationship between education of landless women and their functional participation in Income Generating Activities (IGAs).

Salahuddin (2003) in his study found that the education of rural women had significant positive relationship with their involvement in homestead vegetable production.

Ahsan (2002) found that education of rural women had no significant relationship with their involvement in homestead vegetable production

Aurangozeb (2002) observed that education of the rural women had significant positive relationship with their adoption of integrated homestead farming technologies

Alam (2001) in his study found that education had non-significant relationship with their participation in agriculture, fisheries and poultry programmes of BAUEC.

Akhter (2000) in his study observed that education of the women had significant positive correlation with their participation in decision making role in the family with regard to development activities.

### **2.3.3 Family labour and involvement**

Salahuddin (2003) in his study found that knowledge of the rural women had no significant relationship with their involvement in homestead vegetable production.

Islam (2002) in his study showed that family size of the women had non-significant relationship with their involvement in income generating activities.



Auragozeb (2002) found that family size of the rural women had non-significant relationship with their adoption of integrated homestead farming technologies

Chowdhury (2000) in his study found that family size of the rural women had no significant relationship with their opinion for participation in development activities.

Nahar (2000) reported that there was no relationship between family size and participation of women in homestead vegetable cultivation, poultry, farming and goat rearing.

#### **2.3.4 Land under vegetables cultivation and involvement**

Islam (2008) found that vegetable cultivation area had a positive and substantial significant relationship with knowledge on vegetables production activities by woman members in homestead area under world vision project.

Hasan (2006) concluded that farm size of conventional farmers but not of organic farmers was significantly and positively correlated with their extent of participation in farming activities.

Khatun (2004) found non-significant relationship between family farm size of rural women and their participation in homestead management activities.

Islam (2003) mentioned that farm size of the rural women had a significant negative relationship with their participation in goat rearing.

Islam (2002) in his study observed that farm size of the women had significant positive relationship with their involvement Income Generating Activities (IGAs).

### **2.3.5 Annual income from vegetable cultivation and involvement**

Haque (2008) reported that annual family income of the respondents was significantly related with their participation in alternative livelihood activities.

Islam (2008) found that vegetable cultivation experience had a positive and substantial significant relationship with knowledge on vegetables production activities by woman members in homestead area under world vision project.

Chowdhury (2010) found that annual income had a significant positive relationship with knowledge on maize cultivation in five selected villages of Shibalaya Upazila under Manikgonj District.

Aktaruzzaman (2006) stated that there was non-significant relationship between family income of landless women and their functional participation in Income Generating Activities (IGAs).

Khan (2004) stated that there was non-significant relationship between family annual income of farmers and their participation in farm and community level activities.

Khatun (2004) mentioned significant positive relationship between annual family income of rural women and their participation homestead management activities.

Islam (2002) in his study showed that family income of the women had significant positive relationship with their involvement in income generating activities and decision making in household and health care.

Auragozeb (2002) found that family income of the rural women had significant relationship with their adoption of integrated homestead farming technologies.

Nahar (2000) in her study found that family income had negative significant relationship with participation in homestead vegetable cultivation, post harvest practices, poultry rearing and goat rearing.

### **2.3.6 Cosmopolitanism and involvement**

Amin (2004) concluded that there was no significant relationship between cosmopolitanism of the rural women and their participation in selected aquaculture activities.

Akhter (2000) stated that cosmopolitanism of the rural women had a significant positive relationship with their participation in Income Generating Activities.

Karim (1993) found a significant positive relationship between cosmopolitanism of the transplanted Aman rice growers and their adoption of fertilizers.

Akanda (1994) found that non-localite or cosmopolitanism of rural women was negatively correlated with their participation in homestead vegetable cultivation, cultivation of fruit trees and non-farm householed activities.

### **2.3.7 Use of information sources and involvement**

Akhter (2007) reported that exposure to agricultural information showed significant positive relationship with respondents' extent of participation in homestead waste management activities.

Hasan (2006) concluded that extension contact of organic farmers but not of conventional farmers was significantly and positively correlated with their extent of participation in farming activities.

Khan (2004) observed significant and positive relationship between extension contact of farmer and their participation in farm and community level activities.

Khatun (2004) found non-significant positive relationship between extension contact of rural women and their participation in homestead management activities.

Auragozeb (2002) found that extension media of the rural women had significant positive relationship with their adoption of integrated homestead fanning technologies.

### **2.3.8 Knowledge on post harvest practices and Involvement**

Akhter (2000) in his study observed that agricultural knowledge of rural women had significant positive relationship with their involvement in decision making role in the family with regard to development activities.

### **2.3.9 Commercialization of vegetable and Involvement**

Islam (2007) found that commercialization had a significant positive relationship with adoption of BRRI dhan 29 production technologies by the farmers.

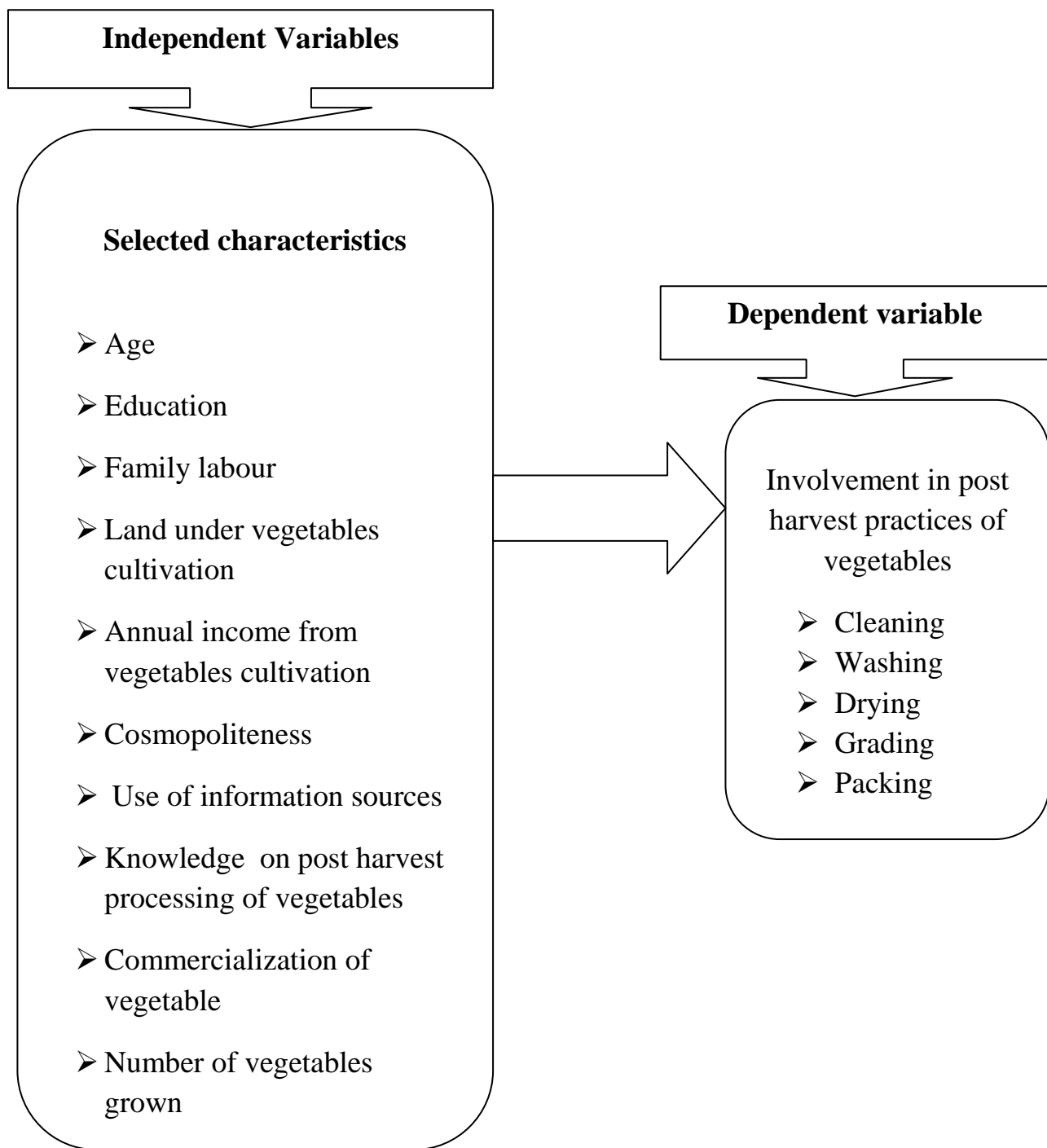
Islam (2002) found that majority of respondents marketed more than 75% of their total vegetables while they opted the rest for their own consumption.

Afrad (2002) found that the commercialization of the respondents had significant relationship with their attitude towards vegetable cultivation.

Marsh and Coleman (1995) after conducting a study at Washington found that there was a significant relationship between value of products sold and adoption behaviour of the farmers.

## **2.4 Conceptual Framework of the Study**

In scientific research, selection and measurement of variables constitute an important task. The hypothesis of a research when constructed properly contains at least two important elements i.e. a dependent variable and an independent variable. A dependent variable is that factor which appears, disappears or varies on the researcher introduces, removes or varies as the independent variables. An independent variable is that factor which is manipulated by the researcher in this attempt to ascertain its relationship to an observed phenomenon. A simple conceptual framework for the study is shown in Figure 2.1.



**Figure 2.1 The Conceptual Framework of the Study**

## **CHAPTER III**

### **METHODOLOGY**

Methodology plays an important role in a scientific research. A researcher should be careful in formulating methods and procedures in conducting research. Appropriate methodology enables the researcher to collect valid and reliable information and to analyze the information properly in order to arrive at correct conclusions. Methods and research procedures followed in this study have been presented in this chapter.

#### **3.1 Locale of the Study**

The study was conducted at two villages of Ruhitpur union of Keranigonj upazila under Dhaka district. There were 12 unions in Keranigonj upazila. Out of 12 unions Ruhitpur union was selected because vegetables are grown plenty in this union. Out of twelve villages of this union two villages (Mugarchar and Lakhirchar) were selected purposively as locale of the study. The location of the study area is depicted in Fig. 3.1 and Fig. 3.2 .

#### **3.2 Population and Sample Size of the Study**

The numbers of villages of Ruhitpur union were 12. It was very difficult to conduct on all the females of 12 villages within a short period of time. So out of 12 villages two villages were selected purposively and the rural women of these two selected villages constituted the population of the study. The number of farm family of these two selected (Mugarchar & Lakhirchar) villages were 306 and 224 respectively. Thus, a total of 530 rural women constituted the population of the study. Out of this 530 rural women around 20 % were selected randomly as the sample of the study. Thus one hundred six (106) farm women were selected as the sample of the study. The village- wise distribution of population and sample of farmers are shown in table 3.1.

Besides this 5 percent of the samples were selected randomly as reserves who were supposed to be interviewed only when a respondent in the original sample list was unavailable during data collection.

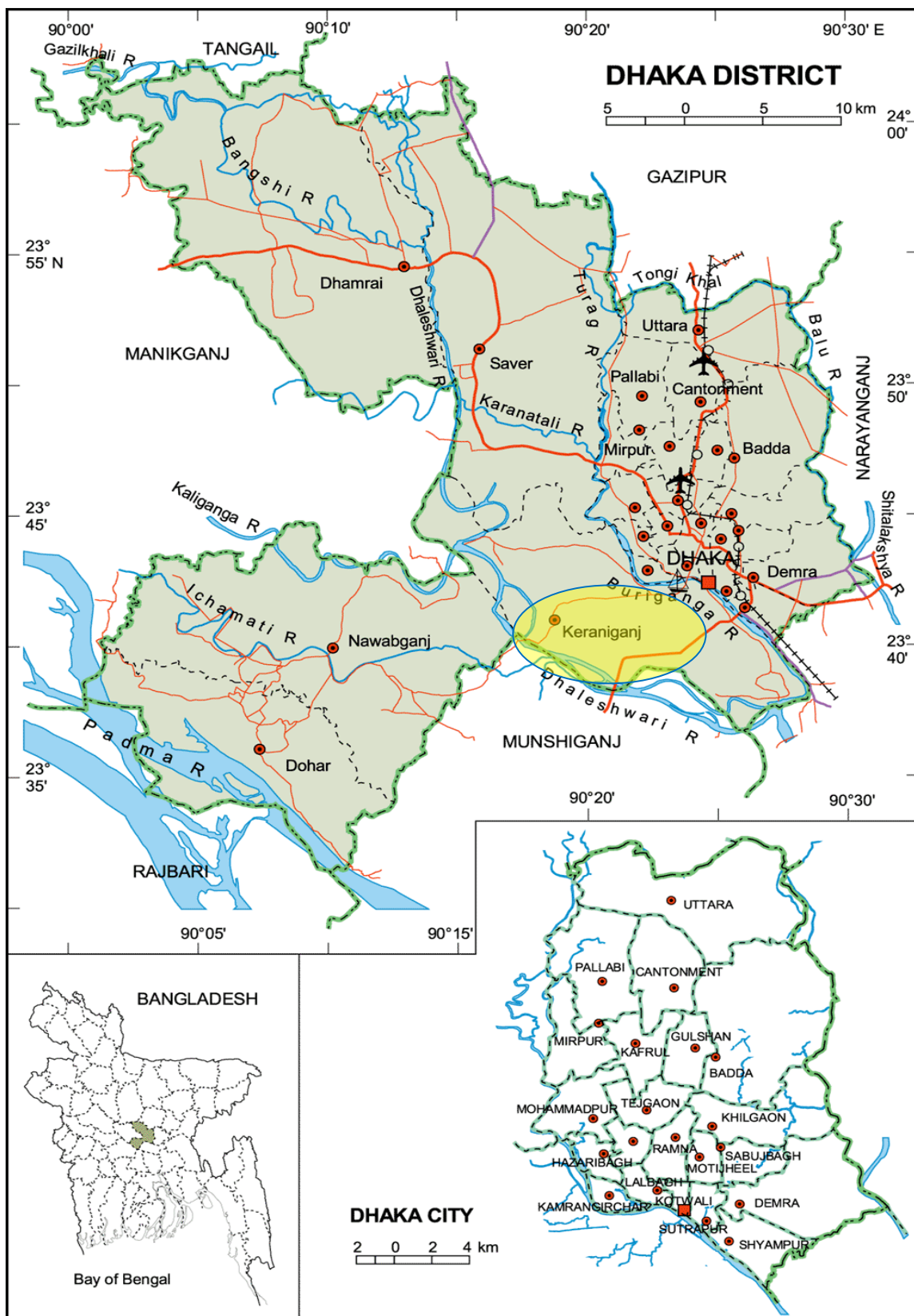


Figure 3.1 A Map of Dhaka district showing Keraniganj Upazila



Figure 3.2 A map of Keraniganj upazila showing the study area (Ruhitpur union)



**Table 3.1 Distribution of the population and sample of the respondents in two villages of Ruhitpur union with reserve list**

Villages	Population (No. of total farm women)	Sample size (20%)	Reserve list (5%)
Mugarchar	306	61	15
Lakhirchar	224	45	11
Total	530	106	26

### **3.3 Data Collecting Instrument:**

Keeping objectives in mind researcher prepared an interview schedule carefully for collecting necessary data from the respondents. Initially prepared interview schedule was pre-tested among 15 respondents of the study area. The pretest was helpful to find out gaps and to locate faulty questions and statements. Alterations and adjustments were made in the schedule on the basis of experience of the pretest. English version of the interview schedule is shown in appendix-A.

### **3.4 Collection of Data**

Data were collected personally by the researcher himself from the sample farmers by using the pretested interview schedule. While starting the interview with any respondent, the researcher took all possible care to establish rapport with him, so that the respondent did not feel any hesitation to furnish proper answer. Researcher also met with the Sub Assistant Agriculture Officer of the respective blocks in order to explain the objectives of the study and requested them to provide necessary help and co-operation in collection of data. The local leaders of the area were also approached to render essential help. Collection of data took 30 days from 15<sup>th</sup> January to 13<sup>th</sup> February, 2018.

### **3.5 Variables of the Study**

In social research, the selection and measurement of variables constitute an important task. A Research hypothesis contains at least two important elements, an independent variable and a dependent variable. The independent variable is the factor that is manipulated by the experimenter to ascertain its relationships to an observed phenomenon. A dependent variable is the factor that appears, disappears, or varies as the

independent variable varies (Townsend, 1953). *The* independent variables of this study were: age, education, family labour, land under vegetables, annual income from vegetables, cosmopolitaness, use of information sources, knowledge on post harvest practices, commercialization of vegetable. The dependent variable was involvement of rural women in post harvest practices of vegetables.

### **3.6 Measurement of the Independent and Dependent variable**

In order to conduct the study in accordance with the objectives it was necessary to measure the selected variables. The procedures followed in measuring the variables are described below.

#### **3.6.1 Measurement of the independent variables**

It was pertinent to follow a methodological procedure for measuring the selected variables in order to contact the study in accordance with the objectives already formulated. The procedures for measuring the independent variables are described below:

##### **3.6.1.1 Age**

Age of the respondent was defined as the span of life and was operationally measured by the number of years from his/her birth to the time of interviewing. Age of a respondent was measured in terms of years from birth to the time of interview which was found on the basis of response (Azad, 2003). A score of one (1) was assigned for each year of age. Question regarding this variable appears in item no. 1 in the interview schedule (Appendix-A).

##### **3.6.1.2 Education**

Empirically it was defined to the development of desirable changes in knowledge, skill and attitudes in an individual through reading, writing, walking, observation and other selected activities. Education was measured in terms of one's year of schooling. One score was given for passing each year in an educational institution (Amin, 2004). For example, if the respondent passed the S.S.C. examination, his education score was given as 10, if passed the final examination of class Seven (VII), his education scores was given as 7. If the respondent did not know how to read and write, his education score was given as '0' (zero). A score of 0.5 (half) was given to that respondent who could sign his/her name only. Question regarding this variable appears in the item no. 2 in the interview schedule (Appendix-A).

### **3.6.1.3 Family labour**

Family labour was measured by the number of family member involved in post harvest activities of vegetables in the family of a respondent. A unit score 1 was assigned for each member of the family. If a respondent had five family labour in her family, her family labour score was given as 5 (Khan, 2004). Question regarding this variable appears in the item no. 3 in the interview schedule (Appendix-A).

### **3.6.1.4 Land under vegetables cultivation**

Vegetable cultivation area referred to the area of land under his/her management only for vegetable cultivation. The area was estimated in terms of full benefit to farmers or his/her family. Land under vegetables was measured by the area of land under his/her management only for vegetable cultivation. The unit of measurement was in dl and was considered as the vegetable cultivation area of a respondent.

### **3.6.1.5 Annual income from vegetables**

Annual income from vegetables of a respondent generally refers to the total earning by him and other members of his family from vegetable cultivation during a year. Income from vegetable cultivation of the respondents was measured in thousand taka on the basis of total annual income from the value of vegetable production. It was expressed in '000' taka.

### **3.6.1.6 Cosmopolitaness**

Cosmopolitaness of a respondent referred to a frequency of visiting different external places per unit time. This variable was measured on the basis of the responses of the respondent's visit of places, against 4-point rating as 'not at all', 'rarely', 'occasionally' and 'frequently' and scores were assigned as 0, 1, 2 and 3 respectively (Alam, 2004 ). Cosmopolitaness was, therefore, determined by adding the total responses against 4 selected visiting places. The scores could range from 0-12, where 0 indicated no cosmopolitaness and 12 indicated very high cosmopolitaness.

### 3.6.1.7 Use of information sources

It refers to contact of rural women with some selected information sources and personalities. The use of information sources was measured on the basis of her extent of contact with some selected information sources. The scoring system was as follows:

Sl. No.	Information source	Extent of use of information sources	Score assigned
1.	Sub-Assistant Agricultural Officer (SAAO)	Not even once	0
		1 time per month	1
		2 times per month	2
		3 times per month	3
2.	Local leader/ Ideal farmer	Not even once	0
		1 -2 times per month	1
		3-4 times per month	2
		5-6 times per month	3
3.	Neighbour	Not even once	0
		1-3 times per month	1
		4-6 times per month	2
		7-9 times per month	3
4.	Television	Not even once	0
		1-2 times per month	1
		3-4 times per month	2
		5-7 times per month	3
5.	Radio	Not even once	0
		1-2 times per week	1
		3-4 times per week	2
		7 times per week	3

The use of information sources of a respondent was calculated by adding all the weights the respondents of 6 information sources together. Thus, the use of information sources score of a respondent could range from Zero (0) to 15, where Zero (0) indicating no use of information and 15 indicating highest use of information.

### 3.6.1.8 Knowledge on post harvest practices

Knowledge is operationally defined for the purpose of this investigation as ‘those behaviors and test situations, which emphasized the remembering either by recognition or recall of ideas, material or phenomenon’. It referred to the amount of understood information possessed by the farmers/ farm women on various aspects of post harvest practices of vegetables.

It was measured based on knowledge of the growers on post harvest practices of vegetables. The knowledge of farm women on post harvest practices of vegetables was determined by computing a knowledge score based on the responses against 10 questions regarding post harvest practices. These questions were collected after thorough consulting with relevant experts reviewing of existing literatures and searching websites. Each of the questions carried a full weight of 2 (two). For each right response, a women received a full weight of 2, for each partial answer she received 1 and for each wrong or no response (as don't know) she received 0 (zero). Thus, the knowledge on post harvest practices score of a respondent could range from Zero (0) to 20, where Zero (0) indicating no knowledge and 20 indicating highest knowledge.

### **3.6.1.9 Commercialization of vegetable**

Commercialization score of a farm women was determined on the basis of value of crops sold out of the total value of crops raised. As developed by Karim and Mahboob (1974) and used by Ali (2008) the following formula was used in computing the commercialization of vegetable score of a farmer:

$$\text{Commercialization score} = \frac{\text{Value of sold vegetable}}{\text{Total value of raised vegetable}} \times 100$$

Relevant market price was used in determining the commercialization score of an individual. Commercialization score could range from 0 to 100, while 0 indicating no commercialization and 100 indicating very high commercialization.

### **3.6.1.10 Number of vegetables grown**

Number of vegetables grown was measured by number of vegetables cultivated by a respondent in a year. If two vegetables grown in a year then the score was 2. If six vegetables grown in a year then the score was 6.

## **3.6.2 Measurement of dependent variable**

The procedure followed in measuring the dependent variable is presented below:

### 3.6.2.1 Involvement of farm women in post harvest practices of vegetables

Involvement of farm women in post harvest practices was measured by using 4-point rating scale (No involvement, Rarely, Occasionally and Regularly) in selected post harvest operations (Cleaning, Washing, Drying, Grading and Packing) during the time of interview. Scoring was made in the following way for involvement in each operation.

Nature of involvement	Score assigned
No involvement	0
Rarely	1
Occasionally	2
Regularly	3

### 3.7 Statement of the Hypotheses

As defined by Goode and Hatt (1952) a hypothesis is “a proposition which can be put to test to determine its validity. It may seem contrary to, or in accord with common sense. It may prove to be correct or incorrect. In any event, however, it leads to an empirical test.”

#### 3.7.1 Research hypotheses

In the light of the objectives of the study and variables selected, the following research hypotheses were formulated to test them in. The research hypotheses were stated in positive form, the hypotheses were as follows: *“Each of the selected characteristics of the farm women had contribution to their involvement in postharvest practices of vegetable.”*

#### 3.7.2 Null hypotheses

In order to conduct statistical tests, the research hypotheses were converted to null form. Hence, the null hypotheses were as follows: *“Each of the selected characteristics of the farm women had no contribution to their involvement in postharvest practices of vegetables.”*

### **3.8 Data Analysis**

The analysis was performed using Statistical Package for Social Sciences (SPSS V 20) computer package. Descriptive analyses such as range, number, percentage, mean, standard deviation were used whenever possible. To find out the contribution of identified characteristics of the involvement of farm women in post-harvest practices of vegetables, multiple regressions was used. Throughout the study, at least five percent (0.05) level of probability was used as basis of rejecting a null hypothesis.

## **CHAPTER IV**

### **RESULT AND DISCUSSION**

The recorded observations in accordance with the objective of the study were presented and probable discussion was made of the findings with probable justifiable and relevant interpretation under this chapter. The findings of the study and their interpretation have been presented in this chapter.

#### **4.1 Characteristics of the Farm Women**

This section deals with the characteristics of farm women which were assumed to be associated with the knowledge on postharvest practices of vegetables. Different women possess different characteristics which are focused by their behavior. In this section 10 characteristics have been discussed. The selected characteristics of the women were; age, education, family labour, land under vegetables, annual income from vegetable, cosmopolitaness, use of information sources, knowledge on post harvest practices of vegetables, commercialization of vegetables and types of vegetable. Measuring unit, range, mean and standard deviations of those characteristics of farm women were described in this section. Table 4.1 provides a summary profile of farm women's characteristics.



**Table 4.1 Characteristics profile of the respondents**

Sl.No.	Characteristics (with measuring unit)	Range		Mean	Standard deviation
		Possible	Observed		
1.	Age (years)	Unknown	25-58	39.13	8.37
2.	Education (schooling years)	Unknown	00-10.0	2.65	2.43
3.	Family labour (no. of members)	Unknown	1-6	3.19	1.22
4.	Land under vegetables cultivation (decimal)	Unknown	24-495	146.47	109.46
5.	Annual income from vegetable cultivation ('000' taka)	Unknown	45-531	166.72	113.17
6.	Cosmopolitaness (score)	0-12	4-9	5.86	1.26
7.	Use of information sources (score)	0-18	4-12	7.04	1.63
8.	Knowledge on post harvest practices of vegetable (score)	0-20	10-16	12.92	1.36
9.	Commercialization of vegetable (score)	0-100	61.50-97.00	86.24	7.40
10.	Number of vegetables (no. of vegetables cultivated)	Unknown	2-6	4.21	1.03

**4.1.1 Age**

Age of the respondents varied from 25 to 58 years, the average being 39.13 years with the standard deviation of 8.37. According to their age, the respondents were classified into three categories as “young aged” (up to 35 years), “middle aged” (36- 50 years) and

“old aged” (above 50 years). The distribution of the respondents according to their age is shown in Table 4.2.

**Table 4.2 Distribution of the respondents according to their age**

Categories	Basis of categorization (year)	Numbers	Percent	Mean	SD
Young	Up to 35	40	37.7	39.13	8.37
Middle aged	36-50	55	51.9		
Old	Above 50	11	10.4		
<b>Total</b>		<b>106</b>	<b>100</b>		

Data represented in Table 4.2 indicate that (51.9 percent) of the respondents were middle aged as compared to 37.7 percent being young and 10.4 percent old. Findings again revealed that more than four fifth (89.6 percent) of the respondents were young to middle aged. Therefore, it could be said that activities regarding the post-harvest practices in the study area were expected to be considerably influenced by the young and middle aged women.

#### **4.1.2 Education**

Education level of the respondents ranged from 0-10 in accordance with year of schooling. The average education score of the respondents was 2.65 with a standard deviation of 2.43. On the basis of their level of education, the women were classified into five categories as shown in Table 4.3.

**Table 4.3 Distribution of the respondents according to their level of education**

Categories	Basis of categorization (Schooling years)	Number	Percent	Mean	SD
Illiterate	0	18	17.0	2.65	2.43
Can sign only	0.5	41	38.7		
Primary	1-5	31	28.3		
Secondary	6-10	17	16.0		
<b>Total</b>		<b>106</b>	<b>100</b>		

Data shown in the Table 4.3 indicated that 38.7 percent of the women could sign their name only compared to 17.0 percent illiterate, 28.3 percent had primary level education and only 16.0 percent had secondary level of education. Data also revealed that majority (67%) of the women had educational qualification from can sign only to primary.

#### 4.1.3 Family labour

The number of family labours of the respondents ranged from 1 to 6 with an average of 3.19 and standard deviation of 1.22. Based on the family labour the respondents were classified into three categories as small, medium and large family as shown in Table 4.4.

**Table 4.4 Distribution of the respondents according to their family labor**

Categories	Basis of categorization (No. of family labor)	Number	Percent	Mean	SD
Small family	Up to 2	29	27.4	3.19	1.22
Medium family	3-4	62	58.4		
Large family	Above 4	15	14.2		
<b>Total</b>		<b>106</b>	<b>100</b>		

Data furnished in the Table 4.4 indicated that the highest proportion (58.4%) of the respondents had medium family labor consisting of 3 to 4 members, while (27.4%) of the respondents belonged to the category of small family labor compared to 14.2% of them

having large family labor. Findings again revealed that 85.8% of the respondent had small and medium family labour.

#### 4.1.4 Land under vegetables cultivation

Vegetable cultivation area of the respondents varied from 24 to 495 decimal, the average being 146.47 ha with the standard deviation of 109.46. The respondents were classified into three categories on the basis of their vegetable cultivation area. The categories were small area, medium area and large area which was done by dividing the observed range into three equal parts.

**Table 4.5 Distribution of farm respondents according to vegetable production area**

Categories	Basis of categorization (Observed range)	Number	Percent	Mean	SD
Small area	Up to 165	77	72.7	146.47	109.46
Medium area	166-247	9	8.4		
Large area	Above 247	20	18.9		
<b>Total</b>		<b>106</b>	<b>100</b>		

Data furnished in Table 4.5 specified that majority (72.7 percent) of the respondents had small area compared to 8.4 percent had medium area and 18.9 percent had large area for vegetable production. Data also revealed that majority (91.6%) of the respondents had small and large area of vegetable cultivation. Therefore, it could be said that the choice of vegetable production regarding the farming practices in the study area are expected to be considerably influenced by the small and large land of the women.

#### 4.1.5 Annual income from vegetable cultivation

Annual income from vegetable cultivation of the respondent ranged from 45 to 531 thousand taka. The mean was 166.72 thousand taka and standard deviation was 113.17. On the basis of annual income from vegetable, the respondents were categorized into three groups as shown in Table 4.6.

**Table 4.6 Distribution of farm respondents according to their annual income from vegetable cultivation**

Categories	Basis of categorization (Observed range)	Number	Percent	Mean	SD
Low income	Up to 177	16	15.1	166.72	113.17
Medium income	178-265	76	71.7		
High income	Above 265	14	13.2		
<b>Total</b>		<b>106</b>	<b>100</b>		

Data furnished in the Table 4.6 indicated that the highest proportion (71.7%) of the respondents had medium family annual income, while (15.1%) of the respondents belonged to the category of small family annual income compared to 13.2% of them having high annual income. Findings again revealed that majority (86.8%) of the respondents had low and medium income. They also have other income sources. Most of the respondents involve in many non agricultural activities (such as business). In some family there are immigrant member and it is a way of income. For this reason, majority of respondents had low and medium income.

#### 4.1.6 Cosmopolitaness

The cosmopolitaness scores of the respondents ranged from 4 to 9 with an average of 5.86 and standard deviation of 1.26. Based on the cosmopolitaness the respondents were classified into three categories as low, medium and high cosmopolitaness as shown in Table 4.7.

**Table 4.7 Distribution of the respondents according to their cosmopolitaness**

Categories	Basis of categorization (Mean $\pm$ Sd)	Number	Percent	Mean	SD
Low	Up to 4	7	6.6	5.86	1.26
Medium	5-8	69	65.1		
High	Above 8	30	28.3		
<b>Total</b>		<b>106</b>	<b>100</b>		

Data furnished in the Table 4.7 indicated that the highest proportion (65.1%) of the respondents had medium cosmopolitaness, while (6.6%) of the respondents belonged to the category of low cosmopolitaness compared to 28.3% of them having high cosmopolitaness. Findings again revealed that majority (93.4%) of the respondents had medium to high cosmopolitaness.

#### 4.1.7 Use of information sources

Use of information sources score of the women ranged from 4 to 12 with a mean and standard deviation of 7.04 and 1.63 respectively. On the basis of use of information sources, the women were classified into three categories (Mean  $\pm$  Standard Deviation) viz. low, medium and high use of information sources. The distribution of the women according to their use of information sources is presented in Table 4.8.

**Table 4.8 Distribution of the respondents' according to their use of information sources**

Categories	Basis of categorization (Mean $\pm$ Sd)	Number	Percent	Mean	SD
Low	Up to 6	39	36.8	7.04	1.63
Medium	6-12	49	46.2		
High	Above 12	18	17.0		
<b>Total</b>		<b>106</b>	<b>100</b>		

Data revealed that farm women having medium use of information sources constitute the highest proportion (46.2 percent), while the lowest proportion in use of information sources were high (17.0 percent) followed by low use of information sources (36.8 percent). Overwhelming majority (83 percent) women have low to medium level use of information sources.

#### 4.1.8 Knowledge on post-harvest practices of vegetable

The post-harvest practices knowledge score could range from 0 to 20 where '0' indicating no knowledge on post-harvest practices and '20' indicating the highest

knowledge. Mean 12.92 and standard deviation 1.36. The distribution of the women according to their knowledge on post-harvest scores is shown in the table 4.9.

**Table 4.9 Distribution of the respondents’ according to their knowledge on post-harvest practices of vegetable**

<b>Categories</b>	<b>Basis of categorization (Mean ± Sd)</b>	<b>Number</b>	<b>Percent</b>	<b>Mean</b>	<b>SD</b>
Low	Up to 12	12	11.3	12.92	1.36
Medium	13-14	55	51.9		
High	Above 14	39	36.8		
<b>Total</b>		<b>106</b>	<b>100</b>		

Data presented in the Table 4.9 shown that the majority (51.9%) of the respondents had medium knowledge on post-harvest practices of vegetable while (36.8%) had high knowledge and (11.3%) of the women had low knowledge on post-harvest practices of vegetable. Overwhelming majority (88.7 percent) farm women have medium to high knowledge on post harvest practices of vegetables.

#### **4.1.9 Commercialization of vegetable**

The observed Commercialization of vegetable score of the respondents ranged from 61.50 to 97.00. The mean score was 86.24 with the standard deviation 7.40. Based on the commercialization of vegetable scores, the respondents were classified into three categories namely “low commercialization of vegetable”, “medium commercialization of vegetable” and “high commercialization of vegetable” as shown in Table 4.10.

**Table 4.10 Distribution of the respondents' according to their commercialization of vegetable**

Categories	Basis of categorization (Possible range)	Number	Percent	Mean	SD
Low	Up to 33	0	0	86.24	7.40
Medium	34-66	72	67.9		
High	Above 66	34	32.1		
<b>Total</b>		<b>106</b>	<b>100</b>		

Data contained in the Table 4.10, revealed that the majority (67.9%) of the women had medium commercialization of vegetable as compared to (32.1%) and (15.1%) having high and low commercialization of vegetable respectively. The majority of the women (67.9%) are in medium commercialization of vegetable.

#### **4.1.10 Number of vegetables grown**

The observed number of vegetable score of the respondents ranged from 2 to 6. The mean score was 4.21 with the standard deviation 1.03. Based on the number of vegetable scores, the respondents were classified into three categories namely low, medium and high as shown in Table 4.11. From observed range, it is seen that the women cultivated vegetables in a range of 2 to 6. The vegetables that were grown by them are bottle gourd, yardlong bean, cabbage, cauliflower, pumpkin, raddish.

**Table 4.11 Distribution of the respondents' according to their number of vegetables grown**

Categories	Basis of categorization (Mean ± Sd)	Number	Percent	Mean	SD
Low	Up to 3	33	31.1	4.21	1.03
Medium	4-5	62	58.5		
High	Above 5	11	10.4		
<b>Total</b>		<b>106</b>	<b>100</b>		



Data contained in the Table 4.11, revealed that the majority (58.5%) of the women had medium number of vegetable as compared to (31.1%) and (10.4%) having low and high number of vegetable respectively. The majority of the women (89.6 percent) grow low to medium number of vegetable.

#### 4.2 Involvement of Rural Women in Post-Harvest Practices of Vegetables

Involvement of rural women in post-harvest practices of vegetables is the dependent variable of this study and it was measured by computing scores according to extent of involvement of rural women in post-harvest practices of vegetables with each of 5 selected activities. The activities were cleaning, washing, drying, grading, packing. Involvement of rural women in post-harvest practices of vegetables cultivation by the women scored varied from 8 to 13 with the mean and standard deviation of 10.35 and 1.45 respectively. On the basis of involvement of rural women in post-harvest practices of vegetables, the women were classified into three categories namely, low, medium and high involvement of rural women in post-harvest practices of vegetables. The distribution of the cultivators according to their Involvement of rural women in post-harvest practices of vegetables under the study is given in Table 4.12.

**Table 4.12 Distribution of the respondents according to their involvement of rural women in post-harvest practices of vegetables**

Categories (Mean ± Sd)	Range (Score)		Respondents'		Mean	SD
	Score	Observed	Number	Percent		
Low	Up to 9	8-13	41	38.7	10.35	1.45
Medium	10-11		35	33.0		
High	Above 11		30	28.3		
<b>Total</b>			<b>106</b>	<b>100</b>		

Table 4.12 indicates that among the respondents the highest 38.7 percent women belong to the group of low involvement regarding in post-harvest practices of vegetables and the lowest 28.3 percent in high involvement. Thirty three (33%) percent of the women were in medium involvement category regarding post harvest practices of vegetables. Among the cultivators most of the women (71.7 percent) have low to medium involvement of rural women in post-harvest practices of vegetables.

### 4.3 The Contribution of the Selected Characteristics of the Respondents to their Involvement of Rural Women in Post-Harvest Practices of Vegetables

In order to estimate the involvement of rural women in post-harvest practices of vegetables from the independent variables, multiple regression analysis were used which is shown in the Table 4.13.

**Table 4.13 Multiple regression coefficients of contributing factors related to the involvement of rural women in post-harvest practices of vegetables**

Dependent variable	Independent variables	$\beta$	$P$	$R^2$	Adj. $R^2$	F
Involvement of rural women in post-harvest processing of vegetables	Age	0.148	.043*	.631	.625	16.26
	Education	0.442	.001**			
	Family labor	-0.061	.433			
	Land under vegetables cultivation	0.230	.180			
	Annual income from vegetable cultivation	-0.331	.105			
	Cosmopolitaness	0.227	.041*			
	Use of information sources	0.060	.446			
	Knowledge on post-harvest processing of vegetable	0.224	.026*			
	Commercialization of vegetable	.108	.200			
	Types of vegetables	0.112	0.202			

\*\* Significant at  $p < 0.01$ ; \* Significant at  $p < 0.05$

The null hypothesis was there is no significant contribution with selected characteristics of women (age, education, family labour, land under vegetables, annual income from

vegetable, cosmopolitaness, use of information sources, knowledge on post-harvest processing of vegetables, commercialization of vegetables and types of vegetables) and involvement of farm women in post-harvest practices of vegetables.

The findings of the study revealed that, the 10 characteristics of the women were taken as independent variables together were effective in predicting involvement of farm women in post-harvest practices of vegetables. The observed F ratio was significant at 0.01 level of accuracy which was an indication that the combinations of the independent variables in involvement of farm women in post-harvest practices of vegetables was effective sixty three (63.1%) percent ( $R^2 = .631$ ) of the variation in the respondents' involvement of farm women in post-harvest practices of vegetables can be attributed to their age, education, cosmopolitaness, knowledge on post-harvest practices of vegetables, making contribution on extent of involvement of rural women in post-harvest practices of vegetables.

However, each predictor may expound some of the variance in respondents' involvement of rural women in post-harvest practices of vegetables conditions simply by chance. The adjusted R-square value penalizes the addition of external predictors in the model, but values of .625 still show that the variance in women's extent of involvement of rural women in post-harvest practices of vegetables can be attributed to the predictor variables rather than by chance and the F value indicate that the model was significant ( $p < 0.01$ ).

From Table 4.13 it was observed that age, education, cosmopolitaness and knowledge on post-harvest practices of vegetables had significant contribution to involvement of rural women in post-harvest practices of vegetables. Data also showed that education was the most significant contributor at 1% ( $p < 0.01$ ) level of significance on involvement of rural women in post-harvest practices of vegetables. It was also showed that age, cosmopolitaness and knowledge on post-harvest practices of vegetables had also significant contribution at ( $p < 0.05$ ) 5% level of significance on involvement of rural women in post-harvest practices of vegetables.

#### **4.3.1 Contribution of education in involvement of rural women in post-harvest practices of vegetables**

The contribution of education in involvement of rural women in post-harvest practices of vegetables women by testing the following null hypothesis; “there is no contribution of education in involvement of rural women in post-harvest practices of vegetables”.

The p value of education was found .001. The following observations were made on the basis of the value of the concerned variable of the study under consideration.

- a. The null hypothesis was rejected. So it can be said that there is significant contribution of education.
- b. The contribution of the education was significant at 1% significance level.
- c. The sign between education and involvement was positive which indicates higher the education more the involvement of rural women in post harvest practices of vegetable.

Based on the above finding, it can be summarized that an women had more education increased the capabilities to involvement of rural women in post-harvest practices of vegetables. Education enhances the abilities of the women that enabled them to involvement of rural women in post-harvest practices of vegetables.

#### **4.3.2 Contribution of knowledge in involvement of rural women in post-harvest practices of vegetables**

The contribution of knowledge involvement of rural women in post-harvest practices of vegetables by testing the following null hypothesis; “There is no contribution of knowledge involvement of farm women in post-harvest practices of vegetables”.

The p value of knowledge on post harvest practices of vegetables was found .026. The following observations were made on the basis of the value of the concerned variable of the study under consideration.

- a. The null hypothesis was rejected. So it can be said that there is significant contribution of knowledge in involvement of farm women in post-harvest practices of vegetables.

- b. The contribution of the knowledge in involvement of rural women in post-harvest practices of vegetables was significant at 5% significance level.
- c. The sign between knowledge on post harvest practices of vegetables and involvement was positive which indicates higher the knowledge more the involvement of rural women in post harvest practices of vegetable.

Based on the above finding, it can be summarized that the people of this particular area were not in conscious about post-harvest practices of vegetables. Knowledge help the people usually to know about updated information related to post-harvest practices of vegetables.

#### **4.3.3 Contribution of cosmopolitaness in involvement of rural women in post-harvest practices of vegetables**

The contribution of cosmopolitaness in involvement of rural women in post-harvest practices of vegetables women by testing the following null hypothesis; “there is no contribution of cosmopolitaness in involvement of rural women in post-harvest practices of vegetables”.

The p value of cosmopolitaness was found .041. The following observations were made on the basis of the value of the concerned variable of the study under consideration.

- a. The null hypothesis was rejected. So it can be said that there is significant contribution of cosmopolitaness in involvement of farm women in post-harvest practices of vegetables.
- b. The contribution of cosmopolitaness in involvement of rural women in post-harvest practices of vegetables was significant at 5% significance level.
- c. The sign between cosmopolitaness and involvement was positive which indicates higher the cosmopolitaness more the involvement of rural women in post harvest practices of vegetable.

Based on the above finding, it was concluded that for the cosmopolitaness had a significant role in increasing the knowledge involvement of rural women in post-harvest practices of vegetables

#### **4.3.4 Contribution of age in involvement of rural women in post-harvest practices of vegetables**

The contribution of age involvement of rural women in post-harvest practices of vegetables women by testing the following null hypothesis; “there is no contribution of age involvement of rural women in post-harvest practices of vegetables”.

The p value of age was found .043. The following observations were made on the basis of the value of the concerned variable of the study under consideration.

- a. The null hypothesis was rejected. So it can be said that there is significant contribution of age in involvement of farm women in post-harvest practices of vegetables.
- b. The contribution of age involvement of rural women in post-harvest practices of vegetables was significant at 5% significance level.
- c. The sign between age and involvement was positive which indicates higher the age more the involvement of rural women in post harvest practices of vegetable.

Based on the above finding, it can be summarized that age increase involvement of rural women in post-harvest practices of vegetables. So, age has significantly contributed to the increase of post harvest practices of vegetables.

## **CHAPTER V**

### **SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

This chapter presents summary of major findings, conclusion and recommendation of the study.

The study entitled “involvement of farm women in post harvest practices of vegetables.” The main purpose of the study was to determine involvement of farm women in post harvest practices of selected vegetables and to ascertain the contribution of the selected characteristics of the farm women to their involvement on post harvest practices of vegetables. The location of the study was two villages (Mugarchar and Lakhirchar) of Ruhitpur union of Keranigonj upazila under Dhaka district.

#### **5.1 Summary of Findings**

##### **5.1.1 Selected characteristics of the farmers**

The major findings of the study are summarized below:

**Age:** Age of the farmers ranged from 25 to 58 years with the average of 39.13 years and the standard deviation was 8.37. Highest proportion (51.9 percent) of the women was under middle aged category.

**Education:** Education score of the respondents ranged from 0 to 10 with the average of 2.65 and the standard deviation was 2.43. Highest proportion (38.7 percent) of the women was under can only sign level of education.

**Family labour:** Above the half (58.4%) of the respondent had medium family labour compare to 27.4% and 14.2% had small and large family labour respectively.

**Land under Vegetables cultivation:** The average land under vegetable cultivation of the respondents was 146.47 with a standard deviation of 109.46 decimal. Land under vegetable cultivation ranges from 24 to 495 decimal. The land under vegetable

cultivation of the respondents was classified into three categories. Majority (72.6%) of the respondents had land under vegetable cultivation.

**Income from vegetables cultivation:** Income from vegetables cultivation score of the respondents ranged from Tk. 10 to Tk. 531 with the average of Tk. 166.72 and the standard deviation was Tk. 113.17. The highest proportion (71.7 percent) of the respondents had medium income from vegetables cultivation while 86.8 percent of the respondents in the study area were low to medium income earner in income from vegetables cultivation.

**Cosmopolitaness:** Cosmopolitaness scores of the women ranged from 4 to 9 against the possible range of 0 to 12. The average cosmopolitaness score was 5.86 with the standard deviation 1.26. The highest proportion (65.1 percent) of the farmers had medium cosmopolitaness compare to 28.3 percent having high cosmopolitaness and 6.6 percent having low cosmopolitaness.

**Use of information sources:** From the data it was observed that majority (46.2%) of the respondent had medium use of information sources compared to 36.8% low use of information sources and 17.0% and high use of information sources.

**Knowledge on post-harvest practices of vegetables:** The highest proportion (51.9 percent) of the respondents had medium knowledge on post-harvest processing of vegetables, while 36.8 percent and 11.3 percent of the respondents had high and low knowledge on post-harvest processing of vegetables respectively.

**Commercialization of vegetables:** The farmers having medium Commercialization of vegetables category constituted the highest proportion (56.8 percent) followed by high commercialization of vegetables (22.6 percent) and low commercialization of vegetables category (15.1 percent).

### **Number of vegetables**

The farmers having medium types of vegetables constitute the highest proportion (58.5percent) followed by low (31.1 percent) and high (10.4 percent) types of vegetables.



### **5.1.2 Involvement of women in post-harvest practices of vegetables**

The highest proportion (38.7 percent) of the respondents had low involvement of women in post-harvest practices of vegetables, while 33.0 percent had medium involvement of women in post-harvest practices of vegetables and the rest 28.3 percent had high involvement of women in post-harvest practices of vegetables.

### **5.1.3 Contribution of the selected characteristics of the farmers to their involvement of women in post-harvest practices of vegetables**

Age, education, cosmopolitaness and knowledge on post-harvest practices of vegetables had significant positive contribution with the involvement of women in post-harvest practices of vegetables. Family labor, land under vegetables cultivation, income from vegetables production, use of information sources, commercialization of vegetables and types of vegetables had no contribution with the involvement of women in post-harvest practices of vegetables.

## **5.2 Conclusions**

Conclusions drawn on the basis of the findings of this study and their logical interpretation in the light of the other relevant factors are furnished below:

- i. The findings revealed that an overwhelming majority (71.7%) of the respondents had low to medium involvement of rural women in post-harvest practices of vegetables at the study area. Therefore the findings indicate still there is a need to improve the figure by taking various steps.
- ii. Age of the women had significant contribution on their extent of involvement of farm women in post-harvest practices of vegetables. So it could be concluded that age played important role to involvement of rural women in post-harvest practices of vegetables.
- iii. Education of the women had significant positive contribution with their involvement of rural women in post-harvest practices of vegetables. The women who were more educated had higher involvement with post harvest practices of vegetable than those who had lower education.

- iv. Cosmopolitaness had significant positive contribution with their involvement of rural women in post-harvest practices of vegetables. The women who were more cosmopolite had higher involvement with post harvest practices of vegetable than those who were lower cosmopolite.
- v. Majority (88.7 percent) of the farm women had medium to high knowledge on post-harvest practices of vegetables, there had a positive significant contribution with knowledge on post-harvest practices of vegetables of the women and their involvement in post-harvest practices of vegetables.

### **5.3 Recommendations**

Recommendations have been divided into two sub sections, viz. recommendations for policy implication and recommendation for further study. Description on these two aspects are given below.

#### **5.3.1 Recommendations for policy implication**

Based on the findings and conclusions of the study, the following recommendations are made:

1. The level of involvement in post harvest practices of vegetables by the women was encouraging. However, there is a need of taking various efforts to increase women involvement for improved practices in post harvest practices of vegetables.
2. The relationship between age of the women and their involvement in post harvest practices of vegetables indicates higher the age more the involvement of farm women in post-harvest practices of vegetables. Therefore, the SAAO should encourage more the younger age women to involve more with post harvest practices of vegetables.
3. Education of the farm women had significant positive contribution with their involvement of rural women in post-harvest practices of vegetables. It indicates the importance of education of the farm women for rapid taking of improved post harvest practices of vegetables . The findings also indicate that 17.0 percent of the farm women are all most illiterate. Under the above situation, it may be recommended that arrangements should be made for increasing the literacy level of the farm women by the concerned authorities through the establishment of night school or adult education centre.
4. Knowledge on post harvest practices of vegetables of farm women had significant positive contribution with their involvement of rural women in post-harvest practices of vegetables. It indicates the importance of knowledge of the farm women for rapid taking of improved post harvest practices of vegetables. The

findings also indicate that 11.3 and 51.9 percent of the farm women have low and medium knowledge. Under the above situation, it may be recommended that arrangements should be made for increasing the knowledge level by arranging training programme.

### **5.3.2 Recommendations for further study**

A small and limited research work cannot provide unique and universal information related to actual impact of improving socio-economic status of the farm women. Further studies should be under taken covering more dimensions of involvement of rural women in post-harvest practices of vegetables.

1. The present study was conducted in Keranigonj upazila under Dhaka district. It is recommended that similar studies should be conducted in other vegetables growing areas of Bangladesh.
2. This study investigated the contribution of ten characteristics of the farm women with their involvement of farm women in post-harvest practices of vegetables as dependent variable. Therefore, it is recommended that further study be conducted with other independent and dependent variables.
3. In the present study family labor, land under vegetables cultivation, income from vegetables cultivation, use of information sources, commercialization of vegetables and types of vegetables had no positive significant contribution with their involvement of farm women in post-harvest practices of vegetables. Moreover, age, education, cosmopolitaness and knowledge on post-harvest practices of vegetables had significant positive contribution with their involvement of farm women in post-harvest practices of vegetables. In this connection, further verification is necessary.
4. Research should also be undertaken to identify the factors causing hindrance towards the involvement of farm women in post-harvest practices of vegetables.

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## APPENDIX-A

English version of the interview schedule

Department of Agricultural Extension and Information System

Sher-e-Bangla Agricultural University

Sher-e-Bangla Nagor, Dhaka-1207.

### INTERVIEW SCHEDULE FOR A STUDY ON

### **INVOLVEMENT OF RURAL WOMEN IN POST HARVEST PROCESSING OF VEGETABLES**

#### **SL.No.**

Name of the respondent :-----  
Village :-----  
Union :-----  
Upazilla :-----  
District :-----

(Please answer the following questions)

**1. Age :** How old are you? ----- Years.

#### **2. Education :**

Please mention your educational status

- a) Can't read or write :-----  
b) Can sign only :-----  
c) Have passed class :-----

**3. Family labour:** How many members of your family are involved in this work? -----

**4. Land under vegetables cultivation:** How much land do you have under vegetable cultivation? ----- dl

### 5. Annual income from vegetables:

Sl. No.	Item	Amount of production (kg)	Value (Tk)
1.	Bottle gourd		
2.	Yardlong bean		
3.	Cabbage		
4.	Cauliflower		
5.	Pumpkin		
6.	Raddish		
7.	Red amaranth		
	Total		

### 6. Cosmopolitaness:

Please mention your frequency of visits of the following places

Sl. No.	Place of visit	Frequency of visit			
		Frequently(3)	Occasionally(2)	Rarely(1)	Not at all(0)
1.	Others village	9 or more times/month	5-8 times/month	1-4 times/month	0 times/month
2.	Other Unions	7 or more times/month	5-6 times/month	1-4 times/month	0 times/month
3.	Own Upazilla	4 or more times/month	2-3 times/month	1time/month	0 times/month
4.	Other Upazilla	3 or more times/year	2 times/year	1time/year	0 times/year

## 7. Use of information sources:

Sl. No.	Information source	Extent of use of information sources			
		Regularly (3)	Occasionally (2)	Rarely (1)	No association (0)
1	Sub-Assistant Agricultural Officer (SAAO)	3 times/ month	2 times/ month	1 time/ month	0 times/ month
2	Local leader /ideal farmer	5-6 times/ month	3-4 times/ month	1-2 times/ month	0 times/ month
3	Neighbour	7-9 times/ year	4-6 times/ year	1-3 times/ year	0 times/ year
4	Television	5-7 times/ month	3-4 times/ month	1-2 times/ month	0 times/ month
5	Radio	7 times/ week	3-4 times/ week	1-2 times/ week	0 times/ week

## 8. Knowledge on post harvest processing:

Please answer the following questions

Sl. No.	Questions	Weighted score	Obtained marks
1.	What do you mean by post harvest activities?	2	
2.	Mention two cleaning techniques.	2	
3.	Why packaging is necessary for vegetables?	2	
4.	Mention two bags name using to package vegetables.	2	
5.	Mention two processing technology.	2	
6.	Why cooling is needed?	2	
7.	What is post harvest shelf life?	2	
8.	Mention two treatments which you use in processing of vegetables.	2	
9.	Mention two preservation technology.	2	
10.	What is post harvest losses?	2	
	Total	20	

## 9. Commercialization of vegetable:

$$\text{Commercialization score} = \frac{\text{Value of sold vegetable}}{\text{Total value of raised vegetable}} \times 100$$

## 10. Number of vegetables grown

Sl. No.	Name
1	Bottle gourd
2	Yardlong bean
3	Cabbage
4	Cauliflower
5	Pumpkin
6	Raddish
7	Red amaranth

## 11. Involvement of rural women in post harvest activities related to processing of vegetables:

Please indicate your extent of involvement in post harvest processing of vegetables:

Sl. No.	Name of activities	Extent of involvement year			
		Regularly(3)	Occasionally(2)	Rarely(1)	Not at all(0)
1.	Cleaning				
2.	Washing				
3.	Drying				
4.	Grading				
5.	Packing				

Thanks for your co-operation.

Date: .....

.....

Signature of the interviewer