

**WOMEN'S PARTICIPATION IN AGRICULTURE IN NOTHERN PART OF
BANGLADESH**

ABU TALHA SOZIB



**DEPARTMENT OF AGRIBUSINESS AND MARKETING
SHER-E-BANGLA AGRICULTURAL UNIVERSITY
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**WOMEN'S PARTICIPATION IN AGRICULTURE IN NOTHERN PART OF
BANGLADESH**

BY

ABU TALHA SOZIB
Registration No. 13-05652

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APPROVED BY:



Sharmin Afrin
Assistant Professor
Supervisor
Department of Agribusiness and
Marketing
Sher-e-Bangla Agricultural University
Sher-e-Bangla Nagar, Dhaka-1207

Sajeeb Saha
Associate Professor
Co-Supervisor
Department of Agribusiness and
Marketing
Sher-e-Bangla Agricultural University
Sher-e-Bangla Nagar, Dhaka-1207

Md. Rashidul Hasan
Chairman
Department of Agribusiness and Marketing
Sher-e-Bangla Agricultural University
Sher-e-Bangla Nagar, Dhaka-1207



Department of Agribusiness and Marketing

Sher-e-Bangla Agricultural University
Sher-e-Bangla Nagar, Dhaka-1207

CERTIFICATE

This is to certify that the thesis entitled “**WOMEN’S PARTICIPATION IN AGRICULTURE IN NOTHERN PART OF BANGLADESH**” submitted to the Faculty of Agribusiness Management, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE in AGRIBUSINESS AND MARKETING**, embodies the result of a piece of bona fide research work carried out by **ABU TALHA SOZIB**, Registration no. **13-05652** under my supervision and guidance. No part of the 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 investigation has been duly acknowledged.

Dated: January-June, 2020
Dhaka, Bangladesh

Sharmin Afrin
Assistant Professor
Supervisor
Department of Agribusiness and
Marketing
Sher-e-Bangla Agricultural University
Sher-e-Bangla Nagar, Dhaka-1207

DEDICATED
TO
MY BELOVED PARENTS

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ABBREVIATIONS

Abbreviation	Full meaning
AEO	Agriculture Extension Officer
BBS	Bangladesh Bureau of Statistics
BRAC	Bangladesh Rural Advancement Committee
BER	Bangladesh Economic Review
DAE	Department of Agricultural Extension
FAO	Food and Agriculture Organization
FY	Fiscal Year
GDP	Gross Domestic Product
GO	Government Organization
IGA	Income Generating Activities
IFMC	Integrated Farm Management Component
KMO	Kaiser-Meyer-Olkin Measure of Sampling Adequacy
LFS	Labour Force Survey
MoWCA	Ministry Women and Children Affairs
NGO	Non-Government Organization
WEI	Women Empowerment Index
WEAI	Women's Empowerment in Agriculture Index
WB	World Bank

WOMEN'S PARTICIPATION IN AGRICULTURE IN NORTHERN PART OF BANGLADESH

ABSTRACT

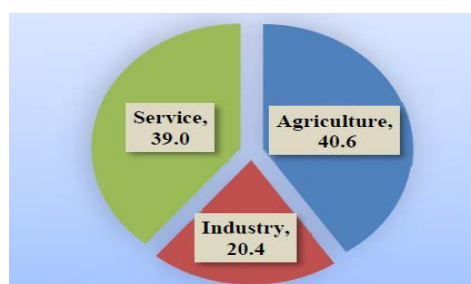
The study was conducted in the 6 upazilla of 3 selected districts of Bangladesh to find out the present status of women participation in agriculture. The aims of the study are to explore women's agricultural participation through a household survey questionnaire for generating quantitative data. A cross-sectional survey method was used to collect responses from 80 respondents. To examine the status and quality of participation, an empowerment index was developed and to compare the impact of participation of women, a comparative assessment was done. It was found that the educational status of the women in this study area is very poor and not up to the mark. We found that about 55 percent of the women participate in agriculture whose age were 30 or below 30 years. From the data of agricultural training profile of participant woman, it was found that about 35 percent of women have taken training about agricultural activities which is not adequate. From factor analysis it was found that crop production decision for consumption, ownership of asset and own educational qualification of participant women are the most influential factor for women empowerment. It was found that the empowerment index for agricultural activities is 3.56 and for non-agricultural activities is 3.76 whereas the average empowerment index for all respondents is 3.66. The weighted average of the decision-making factors it was found that, women mostly play their role in household decision-making factors. So, to increase empowerment and to make women more active, awareness building campaigns and programs to give light of education should be massively run in the rural area.

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Bangladesh, a country that covers an area of 147,570 square kilometers, is one of the predominantly agro-based developing countries in the world. Since her independence in 1971, agriculture has been the core sector of Bangladesh economy. Due to its very fertile land and favorable weather, varieties of crop grow abundantly in this country. Many people are mainly dependent on the agriculture sector both for its employment and livelihood. In the country they worked hard and contributed significantly to agricultural production and family income. Moreover, it is the source of employment, livelihood, and food security for many people and also provides raw material to industry and contributes to the country 's exports. Although the modern economy is largely dependent on industrialization, agriculture remains the lifeblood for many agrarian economies like Bangladesh. The economy of Bangladesh is largely agro-based where the population involved directly or indirectly in agricultural activities. Bangladesh's total population is 161.3 million; of them, 81.0 million were male and 80.3 million were female (BBS, 2018). Agriculture sector (crops, animal farming, forests, and fishing) contributes about 14.23 percent to the country's Gross Domestic Product (GDP) and employs around 40.60 percent of total labor force (BBS, LFS 2016-17). Only food grains production is 413.25 lakh MT. in FY 2017-18. ((Bangladesh Economic Review, 2018). From fig 1. 40.6 % are working in the agriculture sector whereas 39 % and 20.4 % people are working in the service and industry sector respectively (LFS 2016-17).

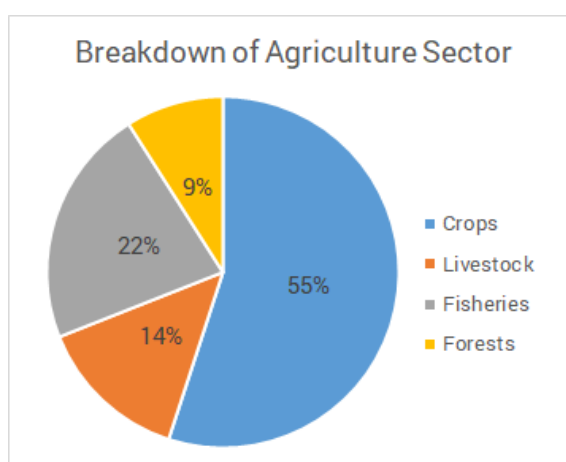


Source: LFS (2016-17)

Figure 1: Distribution of employed persons by the Economic sector.

In this labor force, men as well as women are participating. Family women play a significant and crucial role in agricultural development as well as family income generation in Bangladesh. They make essential contributions to agricultural

development, household activities and pursue multiple livelihood strategies. These activities include producing agricultural crops, cleaning animals, preparing food, working in rural enterprises, engaging in trade and marketing, caring family members and maintaining their homes. Traditionally, women have always played an important role in agriculture- as farmers, co-farmers, wage laborer's and managers of farms. They have conventionally been producers of food from seed to kitchen. According to (BBS,2018) in the fig 2. crops contribution in the agriculture sector is 55% whereas livestock and fisheries have 14 % and 22%, but forests have only 9%.



Source: (BBS, 2018)

Figure 2: Sector Wise Contribution of Agriculture

Women's agricultural activities were confined to homestead production and post-harvest operations; however, in recent years they are mostly involved in livestock and poultry rearing activities besides crop production activities. A number of studies were conducted on women's activities during 1980s (Abdullah and Zeidenstein, 1982; Ahsan, et.al, 1986; Begum, 1983; Chowdhury, 1986; Farouk, 1979 and 1983; Halim and McCarrthy, 1985; Westergaard, 1983, Jaim and Rahman, 1988).

They carry the heavier work burden in food production and because of gender discrimination, get lower returns for their work. The multiple roles of women lead to a significant contribution in real terms to the productive system. But it is unfortunate that her role is not adequately recognized and properly her contribution not qualified in the male- dominated society. They have been underrepresented in the development process. The female contribution to the overall economy, particularly in agriculture is high throughout Asia. Among the neighboring countries, only 59 percent of Bangladeshi women, as compared to over 74 per cent of Indian, 64 percent Pakistani and 85 percent Nepali women, are employed in agriculture. (FAO, 2003). Women in

Bangladesh Hardly participate in agricultural activities outside home. Women's economic activities were confined to homestead production and post-harvest operations. (Hossain and Bayes, 2009). *et. al.*,

Bangladesh is a densely populated country. Its total population was 161.3 million; of them, 81.0 million were male and 80.3 million were female (BBS, 2018). Women constitute almost half of the total population of the country. They can play a vital role in economic development of the family and of the nation (Roy, *et. al.*, 2017). Recent labor force survey conducted by the Bureau of Statistics showed rapidly increased participation of women in economic activities (BBS, 2018). Family women play a significant and crucial role in agricultural development as well as family income generation in Bangladesh.

Agriculture sector also plays a vibrant role in reducing incidence of poverty in the country. As poverty is largely a rural phenomenon, the agriculture sector contributed to the scale-down of 90 percent poverty in the country between 2005 and 2010 (World Bank, 2016). Agriculture sector in Bangladesh is also playing a pivotal role ensuring food security through enhanced production and creating employment opportunities for the people (Center for Research and Information, 2014). Women are essential contributors to agriculture and rural economics in developing countries. Although their role varies within and between different regions, their involvement is conspicuous irrespective of country borders. Women make up 43% of the labor force in developing countries (FAO, 2011).

Women's economic activities were confined to homestead production and post-harvest operations. If women workers get recognition to their works in agriculture and get fair wages, they would be interested in agriculture. As a result, production in agricultural sector would increase and agriculture's contribution to GDP would also increase. Nearly half of the total workers and about 87 percent of the rural households depend upon agriculture for at least a proportion of their income (World Bank, 2016). The majority of women, who are mostly poor, vulnerable and marginalized, live in rural areas. They play an important role in seed production, animal husbandry, fisheries, post-harvest management, conservation of biological diversity, management of energy and family (Anon, 1995).

Percentage of adult women participating in agriculture remained almost the same in 1988 and 2000 (59% and 58% respectively), but compared to 2000 this has increased in 2008 (66%). Over the years, women involvement related to crop production has decreased which has been substantially compensated by involvement in livestock and poultry production activities. At the same time, involvement of women in homestead gardening has increased over time and has been doubled in 2008 compared to 2000 (from 9% in 2000 to 18% in 2008) (Jaim and Hossain, 2013). The progress is attributed to poverty, empowerment of women by NGOs and migration of male members from agriculture to non-farm occupation. With the absence of male members, women's role is changing from unpaid family worker to farm managers, a phenomenon termed as "feminization of agriculture".

Women participation in agriculture has increased in recent years; however, their participation in crop production activities has drastically reduced in recent years. On the other hand, participation of women in livestock and poultry production activities as well as in homestead gardening has gradually increased to a considerable extent. As women in Bangladesh find more comfortable engaging in agricultural activities within the boundary of household rather than in the field for crop production activities, home-based agricultural activities like livestock and poultry production as well as homestead gardening should be encouraged through providing more credit and training facilities to women (Jaim and Hossain, 2013). There has been scarcity of rural agricultural labor force in recent years and farm technologies have not yet sufficiently developed to cope with this scarcity. Therefore, women participation, particularly in Birner, R., A. agriculture as entrepreneurs is increasing in Bangladesh (Hossain and Jaim 2011; Quisumbing, and N. Ahmed 2010; etc)

The lack of access to and control over productive resources is the main factor limiting women's equal participation in economic activities, thereby hampering the human development process (Acharya, 2003). Women's participation in economic activities can automatically increase the overall status of women and as well as make them empowered. Some studies in South Asia find that economic empowerment has been the entry point for overall empowerment of women if they are organized under a common platform (Carr et al., 1996).

Rural women in Asia play a significant role in the agricultural sector, particularly in postharvest activities (Unnevehr and Stanford, 1985; Begum, 1985). Recent studies in

Bangladesh have revealed an increasing involvement of women in field crop production in addition to their traditional role in post-harvest activities (Rahman and Routray, 1998). Despite their tremendous contribution to food production and well-being for the household, rural women are underestimated in development strategies (Murshid and Yasmeen, 2004). In Bangladesh, being a traditional Muslim society, women in Bangladesh hardly participate in agricultural activities outside home (Hossain and Bayes, 2009). These studies found that women's contribution to socio-economic development were not visible, perhaps due to a set of social norms that enabled men to dominate women (Bose, *et. al.*, 2009). The fisheries sector, second only to agriculture in the overall economy of Bangladesh, also involves women's participation at various levels with varying degrees of intensity. However, literature on the role and contribution of women to the fisheries sector in Bangladesh is scanty. For example, in recent years, shrimp farming has expanded rapidly, particularly in coastal areas. The expansion of this industry has provided employment opportunities for women in various activities (Rahman, *et. Al.*, 2011)

Women's participation in agriculture is greater, as is their contribution to farm income, in small farms oriented to local rather than export markets (Dixon 1983). Empowerment in the agriculture initiates women's active participation especially in five domains such as (a) decision making procedure regarding agricultural production; (b) decision making power and access to productive resources; (c) control over income; (d) leading the community; and (e) time distribution (Alkire *et al.*, 2013). women in Bangladesh get little chances to be empowered through agriculture even though they are found to be involved in all kinds of activities in this sector such as post-harvest management of crops, seed production and preservation, tending animals, homestead gardening, intercultural operations, and so on (Rahman, 2000)

It is also to mention that female farmers who work in the land of rich farmers on daily basis are victimized in terms of payment and stigmatized as physically weaker and less productive compared to male farmer (Rahman, 2010). Al-Mamun *et al.* (2010) argues that home gardening activities are centered on women and it can also increase the income of women, which may result in the better use of household resources and improved caring practices and empowerment. About 70 percent of 10 million farm households have below one hectare of land (small farm) (Anonymous, 2011). An analysis conducted by FAO confirms that the Millennium Development Goals on

gender equality (MDG 3) and poverty and food security (MDG 1) are mutually reinforcing. FAO concludes that gender equality is good for agriculture, food security and society; and policies can make a difference.

Women's involvement is the highest in post-harvest activities compared to pre-harvest activities. It is common across all the villages for women from farm households to thresh, husk, winnow, parboil and dry paddy. Women from farm households get involved in the highest number of activities during this period. Thus, apart from the common activities they also are involved in harvesting, bringing the harvest home side by side with the men and collecting and storing seeds of all major agricultural crops. Women from farm households carry out home-based agricultural activities only, but many farmers utilize the services of female daily wage workers who undertake activities that are to female farmers in the northern part of Bangladesh. Women are the sole decision makers only in issues concerning small size vegetable production, poultry, fish and livestock primarily aimed at meeting household consumption needs.

Women in agriculture are a popular area of study and now it is well accepted that women are the initiators of agricultural activities in the history of mankind. Women carry a heavy load to convert paddy to edible grain by threshing, soaking, parboiling, drying, husking, winnowing and preserving seed. Milling is the final rice post-harvest processing. It includes pre-cleaning, husking, bran removal, cleaning and grading (Rahman and Hasan, 2011). Akter (1995), Salauddin (1980) and Harriss (1978) reported that about 65% of paddy is milled by traditional methods and 90% of rice produced in Bangladesh is processed by women in their homesteads and in small custom mills located in the rural areas. The traditional means of post-harvest operations are very slow and hazardous to health, particularly for women.

In Bangladesh the movement for women's emancipation is going on as a part of the process of social change and not as a revolutionary movement. In the country they worked hard and contributed significantly to agricultural production and family income. Unless the actual and potential contribution of women to the agricultural production process is recognized, efforts to improve the wellbeing of farm household and ensuring food security will be hampered. In today's society, the role of women extends way beyond the home and bringing- up of children. Women have to perform the dual role of housewife and wage earner. In rural areas, women are engaged in farm operation as cultivators, assistants to male cultivators and agricultural labourers. They

also show their involvement in planning, decision making and supervisory activities. Women participation in home and farm activities is dependent upon social, cultural and economic conditions in the area. It also varies from region to region and even within a region, their involvement varies widely among different farming systems, castes, classes and socio-economic status (Kada and Kada, 1985). In spite of several restrictions, women of the low-income households are found working outside their home due to severe economic pressures, while women of the medium and high-income household seek employment in order to decrease self-dependency and to increase the standard of living.

1.2 Research Questions

The following research questions were formulated in order to get data for answering the major research question:

- What are the socio-economic statuses of women who work for different income generating activities?
- What are the factors that influenced women to be an earner?
- What is the extent of the contribution to household income, freedom to use own income and ownership of assets by women workers?

1.3 Objectives of the Study

The specific objectives of the study are as follows-

1. To know the contribution of women participation in agriculture of selected regions.
2. To determine the influencing factors for enhancing the women empowerment in the agriculture sector.
3. To explore the Women Empowerment Index (WEI) through involvement in Agriculture.

1.4 Limitations of the Study

Since the study is an empirical one based on field-work through the interviews of women of northern three districts of Bangladesh. It has some limitations. These are as follow

- Present study covered women participation in Agriculture in three districts of the northern part of Bangladesh. A large number of women workers outside the place were out of the purview of the present study. This may not reflect the total picture of Bangladesh relating to status and impact of women participation in Agricultural activities.
- Gathering information from some of the women was sometimes very difficult and extremely time-consuming. They did not give enough time to the interviewers.
- Contacting women to gather information was a very difficult task because of their involvement in household works, family maintenance also with gardening or other income generating activities.
- In view of time and resource constraints, conducting a comprehensive study in full depth and width has not been possible.

CHAPTER II

REVIEW OF LITERATURE

2.1 Introduction

In this chapter, reviews of the literature related to the study are presented. The researcher intensively searched internet, websites, available books, journals and printed materials from different sources of home and abroad. The main purpose of this chapter is to review the past research works that are pertinent of this study.

Firstly, the chapter focuses on women participation in agriculture where agricultural activities as those which generate income for the households or saves household expenditure for the acquisition of the goods from the market. For example, crop cultivation, homestead gardening, livestock and poultry raising, fishing. It focuses on findings from previous studies with regard to income earning from agricultural activities by women, economic development and women's empowerment.

2.2 Women Participation in Agriculture of Bangladesh

Ferdous *et al.*, (2017) said that the economy of Bangladesh predominantly depends on agriculture. Both men and women participate in agriculture related activities of this country. However, women's involvement in the agriculture sector has all through been ignored historically

Chowdhury *et al.*, (2009) said Bangladesh's economy Bangladesh is predominantly based on agriculture and other activities related to the agriculture sector. Hence an overwhelming majority of the rural population is mainly dependent on the agriculture sector both for its employment and livelihood. In the country they worked hard and contributed significantly to agricultural production and family income.

Rashid *et al.*, (2019) said that Bangladesh is experiencing a rapid growth in the participation of women in the agriculture sector since the middle of 1990s. Their participation covers almost all the sectors of agriculture, particularly crop processing, small scale vegetable, poultry, cattle, and fish production. Linking women with agricultural extension service could provide widespread benefits, such as improving business efficiency, strengthening food security, reducing poverty, and ensuring household nutrition. It will also open a new window of job opportunities and remove discriminatory beliefs and practices. Despite the numerous benefits, women's participation in agricultural extension programs is still not convincing and their

participation is often hindered by limited capacity and structure of the extension service, male biased client selection policies, limited access to assets and resources, and low individual and group agency.

Roy (2016) said that a large majority of the households in Bangladesh depend upon agriculture and related activities like livestock rearing, fisheries and forestry. Official statistics often underestimate the value of women's work and their overall contribution to national wealth. Women continue to provide a large proportion of the labor that goes into agriculture. Most often, activities such as care of livestock and poultry, vegetable growing, post-harvest processing and preservation, are usually done by women in the farm households.

Haque *et al.*, (2017) was conducted the study to measure the contribution of women to their household income, to analyze the pattern of women's participation in the decision-making process, their perceptions and impact of income on the decision-making process.

Jaim and Hossain (2015) said that male farmers moving to remunerative non-farm jobs by male farmers indicate labor crisis for agricultural operations in the rural areas will aggravate which will demand participation of more women in agriculture. In the face of male labor crisis, increased women involvement in crop production activities is mostly related to managerial activities now. Most of the technologies developed for agriculture are related to pre-harvest. Women participation in agriculture has increased in recent years; however, their participation in crop production activities has drastically reduced in recent years. On the other hand, participation of women in livestock and poultry production activities as well as in homestead gardening has gradually increased to a considerable extent.

Karim and Wee (1996) mentioned that women were involved in seed collection, seed storage, fertilizer application, and daily maintenance and harvesting. In the case of tribal people, vegetables were grown mostly cared for by women.

In Bangladesh, being a traditional Muslim society, women in Bangladesh hardly participate in agricultural activities outside home (Hossain and Bayes, 2009; Abdullah and Zeidenstein, 1982).

Bose *et al.*, (2009) states that the study found women's contribution to socio-economic development were not visible, perhaps due to a set of social norms that enabled men to dominate women.

Rahman (2007) indicated that a large proportion (73 percent) of the rural women had medium participation in homestead agricultural activities compared to 20 and 7 percent having low and high participation in homestead agricultural activities respectively. This scenario is not satisfactory and therefore should be overcome immediately by taking necessary steps by GOs and NGOs.

Agricultural Diary (2012) published a report in which it was found that in Bangladesh, women hardly participate in agricultural activities outside their homes. About half (49 percent) of the population of Bangladesh is women among them 45.6 percent are associated with the farming activities. Women from farm households commonly engage in seed processing for major agricultural crops such as rice, potato, maize and wheat. Women from farm households (particularly those from medium and large farm households) rarely get involved in activities in the production phase. In most of the villages, they just guard the fields against crop damage by animals. Women from marginal farm households are actively engaged in field activities e.g., irrigating, weeding and applying fertilizer on their own fields. Aside from working as unpaid family workers, they also work as wage laborers in other farms to earn additional income.

Ajayi (1995) performed analysis based on the descriptive examination of women's agricultural activities in four local government areas giving emphasis on market economy that features very prominently in national income accounting, erroneous belief that most rural women do not make an appreciable contribution to crop production is undetermined. He found that most women take part in planting, weeding, harvesting, and post-harvest activities of subsistence crops.

Chakma (1995) in a socio-economic study in a selected area of Khagrachari Hill district found that women and children participation from the landless group was the highest particularly in the case of hiring out the labour.

Akanda (1994) in his study revealed that the highest proportion of the rural women had high participation in vegetable cultivation while only 15 percent of them had high participation in the cultivation of fruit trees.

Ferdous *et al.*, (2017) said that the economy of Bangladesh predominantly depends on agriculture. Both men and women participate in agriculture related activities of this country. The results show that 63% of the respondents remained unpaid labour although 78% of them work about 8-10 hours per day. Moreover, 89% among the paid female labour stated that they do not get the same wages like the male labour in the agriculture sector of Bangladesh. In addition, 79% of the study population opined that their labour in agriculture remains unrecognized by their husbands or other family members.

Al Mamun *et al.*, (2018) said that the highest proportion of the rural women had low to medium participation in homestead vegetable cultivation. The respondents' participation was highest in seedbed preparation and raising of seedlings while it was least in intercultural operation. In case of 26-issues under 6- aspects of homestead vegetable cultivation, the high dominant area of participation by the respondents were seed collection. The least dominant area of participation was training. Only age showed a significant relationship with their participation in homestead vegetable cultivation. Thus, it might be concluded from the gist findings mentioned above that, participation of women in homestead vegetable production is still not satisfactory and necessary steps concerning extension approach should be taken to increase the vegetable production by ensuring barrier free participation of rural women in homestead vegetable cultivation.

Khatun *et al.*, (2014) found that participation of women considering different aspects in relation to vegetables cultivation, tilling by spade was ranked first. In case of the cultivation of fruit trees, the highest proportion (46.60 percent) of rural women had medium participation and irrigation after planting was in the first position. Agricultural knowledge, attitude and innovativeness had a positive relationship with the cultivation of vegetables. On the other hand, education, family income, cosmopolitaness behavior and attitude had a positive relationship with the cultivation of fruit trees.

Nahar (2008) in her study in a selected area of Gazipur district observed that the involvement of rural women in each of the homestead activities i.e., homestead vegetable cultivation, postharvest activities, poultry raising and goat rearing and the extent of participation is high in all cases which is highly encouraging. In fact, these kinds of activities are mostly performed by the rural women in our country and have perfectly reflected in her study. Ahmad *et al.*, (2007) reported that the personal characteristics showed that the majority of respondents were in the age group of 20–40

years, 54 percent of the total respondents were educated, 73 percent of the respondents had a barani type of land. Education and adoption of vegetable growing practices were positively correlated. The results further showed that 54 percent of the respondents grew vegetables inside their houses, among which 47.5 percent grew vegetables for profit purpose and 47 percent of the female respondents grew vegetables themselves.

2.3 Impact on Family Income for Women Participation in Agriculture

Chowdhury (2009) conducted a study on participation of women in farm and non-farm activities in two villages of Sadar Upazilla of Mymenshingh district. This study showed that in case of both low and medium income households, female participation is moderately higher in non-farm activities than the high-income households.

Nahar (2008) in her study in a selected area of Gazipur district observed that the involvement of rural woman in each of the homestead activities i.e., homestead vegetable cultivation, post-harvest activities, poultry raising and goat rearing and the extent of participation is high in all cases which is highly encouraging. In fact, these kinds of activities are mostly performed by the rural women in our country. Which affects the family income and expenditure of family livelihood?

Akhtaruzzaman (2006) stated in his study that there was a significant positive relationship between age of landless women and their functional participation in Income Generating Activities (IGAs).

Parveen *et al.*, (2013) study examined that different sources of family income in small, medium and large farms. In the study area, homestead vegetables and fruits production were the main sources of family income for all categories of farms. Main source of income in small farms was daily labor, which shared about 34.17% of total income. Vegetable and fruits production contributed 28.93% and service sector provided 22.12% and others 4.89%. In agriculture, the crop sector contributed 15.36% and livestock and poultry 1.86%. In the case of medium and large farmer's vegetables and fruits production were the main source of income which accounted for 35.87% and 36.08% of total family income, respectively. A significant share of total income (23.38%) comes from services and 3.66% of total income comes from livestock and poultry for all categories of farms.

Roy (2016) said that in Bangladesh the share of women in the total economically active population is 39%, indicating relatively lower economic participation by women. Most

often, activities such as care of livestock and poultry, vegetable growing, post-harvest processing and preservation, are usually done by women in the farm households. Revised enumeration methods documented that about 65% of the employed population has been engaged in agriculture and related industrial activities. In this sector 71.5% of women were employed compared to 60.3% of men. Women, who primarily work as unpaid family workers, accounted for 45.6% of total employment in agriculture.

Ferdous *et al.*, (2017) said that women's participation in decision making procedures in terms of household activities and agricultural products are 29%, 13% respectively. Furthermore, only 23% of the respondents enjoy the rights of spending the money which they earn by working in the agricultural field.

Al-Mamun *et al.*, (2010) argues that home gardening activities are centered on women and it can also increase the income of women, which may result in the better use of household resources and improved caring practices and empowerment.

Sattar (1979) stated that women have a larger contribution to the country's economy but their contributions are not considered in the programs taken for the development of the country. Findings of the study revealed that women participate in the post-harvest operations vegetable cultivation, fruit culture, livestock care etc. which have great contribution to the family income.

Haque *et al.*, (2017) conducted the study in Mymensingh, the results of the study showed that the pattern of women's contribution to household income has been changed. In the study area, women were participating in various income generating activities such as crop production, post-harvest activities, poultry rearing, management of livestock and fisheries, etc. Male and female rendered their involvement in income generating activities.

Rahman and hasan (2011) said that Women contributed a small amount but a significant proportion of their total family income. Poverty alleviation can hardly be achieved unless the women are directly being involved in income generating activities. The socioeconomic status of the women in farm and rice mill labourers should be improved through their direct participation in income generating activities. The educational status, land holding and other household assets position were improved due to the women's contribution to overall family income.

Chowdhury *et al.*, (2009) Women's participation rates for homestead gardening and livestock and poultry rearing and post-harvest operation stood at 91 and 96 and 93 per cent in low-income households and 74 and 88 and 72 per cent in medium income households and 90250 Rural women in farm and non-farm activities and 87 and 89 per cent in high income households respectively. The finding of the present study reveals that contribution of female labour in different activities as well as in total family income was substantial. This was particularly true for low-income households.

Blau and Khan (2006) consider the impact on family income of wages of both women participants and their spouses while controlling for income from other sources.

Jaim and Hossain *et al.*, (2011) said that participation of women in agriculture on the other hand remained almost the same in 1988 and 2000 (59% and 58% respectively); but compared to 2000, in 2008 women participation has increased by about 8 %.

Klasen and Pieters (2013) use the share of household income earned in regular salaried employment and also by the number of underemployed men in the household.

Mahmud and Bidisha (2018) include variables for household head's education to capture the socioeconomic position of the household, and, while considering that a significant percentage of women are employed in rural farm-based activities as unpaid family workers, include household head's occupational dummy (whether self-employed or not) in the analysis. In the case of the labour market, the most noticeable change has been observed with regard to rising participation of women in the labour market, with the rate rising from around 8% in the mid-1980s to almost 36% in 2016/17.

Raihan and Jahan (2018) emphasize the positive role of social protection in female labour market participation in Bangladesh.

Raihan *et al.*, (2018) show that a number of socioeconomic factors, in addition to the conventional factors prevailing in the labour market, contribute towards involvement in unpaid activities and constrain participation in the mainstream labour market. As a result, a large number of individuals, particularly women, are compelled to work as unpaid family workers within their household, where their contribution is not duly recognized in either monetary or non-monetary terms.

Amin (2005) has argued that due to home-based economic activities has pushed the female labour force participation in Bangladesh. He also found that female-headed households, smaller family size, lower educational attainment, living in urban areas,

lower levels of household wealth and microcredit have a positive impact on participation. Moreover, the data set does not have information on self/family employment, which is a larger component of female employment and the study cannot provide insights into its determinants.

Chowdhury *et al.*, (2009) observed that women are good partners of the socioeconomic development of the country in general and the family in particular. They can contribute significantly to the socio-economic upliftment of the family if a proper environment with facilities can be ensured. In addition, the economy of this country solely depends on agriculture where women constitute more than 50 percent of the total workforce (Doss, 2011).

Ferdous *et al.*, (2017) said that labour as well as contributions in agriculture are greatly disregarded by the family members, society and the state as well. The reason behind this ignorance is based primarily on the patriarchal nature of this country, unequal payment of labour, absence of ownership of land, and so forth. Rural women do not have more job options as they are mostly uneducated, unskilled, and choose not to move from one place to another. Consequently, working in the agriculture field is widely accepted in this country. Furthermore, some of the rural women also work as the wage labour in the land of rich farmers to run the family in absence of male bread earners. In this case, women can enjoy some sort of freedom to spend the money that they earn.

Goldin, 1995; Verick, 2014; Heath and Jayachandran, 2016 said that in a cross-country context, while analysing the relationship between economic development and female labour market participation, some researchers have found a U-shaped pattern.

Goldin (1995) explains this by the dominance of agricultural activities at low levels of gross domestic product (GDP), followed by a decline in agricultural activities and a fall in female participation. In the later stages of development, higher economic growth, driven primarily by services sector activities, is likely to fuel women's labour market participation with a gradual shift away from home-based activities (Goldin, 1995; Rahman and Islam, 2013). This U-shaped relationship is found not to be consistent across countries,

Heath and Jayachandran (2016) said that in the case of most developing countries, female employment has been found as rising with varying trends. Positive impact of education on labour supply, it is crucial that jobs be such that they reward education.

As the country's development process shifting up the women participation rate shows declining trends from increasing trends experienced during early development-trend in women's employment hypothesizes a U-shaped relationship between economic growth and women's employment (Bosereup, 1970, 1990; Psacharopoulos and Tzannatos, 1989, 1991; Schultz, 1990).

World Bank (2017) said that the five countries studied are diverse in terms of poverty and female employment in agriculture. Mozambique and Nepal are classified as low-income countries, and Bangladesh, Cambodia, and Ghana are considered lower-middle income countries.

Mechanization of post-harvest operations in Bangladesh reduced women's labor input in large- and small-landed households, increasing leisure time in the first case and reducing the work burden in the second. (Begum (198, Scott and Carr 1985).

Ferdous *et al.*, (2017) said that rural women do not have more job options as they are mostly uneducated, unskilled, and choose not to move from one place to another. Consequently, working in the agriculture field is widely accepted in this country. Furthermore, some of the rural women also work as the wage labour in the land of rich farmers to run the family in absence of male bread earners. In this case, women can enjoy some sort of freedom to spend the money that they earn.

2.4 Empowerment of Women

Sraboni *et al.*, (2014) conducted the research which shows that about 77 per cent of rural women in Bangladesh are disempowered compared to around 56 per cent of men. It is also seen that empowerment gaps for women are greatest in terms of leadership in the community and control and access to resources. Women are key actors within the agriculture and food system in Bangladesh. As the 2013 National Agricultural Policy of Bangladesh recognizes, empowering women, encouraging their participation in production and marketing for income generation, and ensuring their nutritional status are vital for improving food security in the country (MoA 2013). Women's economic and social advancement are also stated goals of the Ministry Women and Children Affairs (MoWCA). However, about 77 per cent of rural women in Bangladesh are disempowered, as this study shows using the Women's Empowerment in Agriculture Index (WEAI) and the data from the 2012 Bangladesh Integrated Household Survey.

Haque *et al.*, (2017) said that women rendered a great deal of contribution in making decisions on post-harvest operation, management of production activities, selling of crops, rearing poultry, goat and cattle, purchasing of agricultural inputs, etc. To reduce their economic, social and political constraints, the study suggested providing logistic supports such as health care facility, credit facility, input supply, agricultural extension services, need-based training, etc. in order to increase their participation in income generating activities and different household decision making events.

Shelly *et al.*, (2016). The population is increasing about 2 million every year, and if the population increments in light of present conditions, the all-out population will be 38 million by 2050. It's important for developing the economy of Bangladesh by empowering women.

FAO (2011) said that agriculture is underperforming in many developing countries, and one of the key reasons is that women do not have equal access to the resources and opportunities they need to be more productive.

Meinzen-Dick and Quisumbing (2010) states that food needs of the future population would not be met or productivity translating into improved welfare for the poor would not occur unless gender is taken into account seriously in agricultural research and development. Paying attention to gender is not only ideology but a matter of development effectiveness.

Rahman and Hasan (2011) study were undertaken to examine the socio-economic profiles of women participated in farms and rice mills activities; to examine contribution of women to household income which reducing their poverty; to identify the factors influencing the level of family income in farms and rice mills labourers; and to identify the problems and constraints of farms and rice mills. Patterns of family expenditure remained same before and after the women's involvement in farm and rice mill works but increased over time that indicated some significant changes in the level of poverty of the households. Increasing income contributed significantly to the variability of income and employment. Major problems were the nature of the work and the variation in the salary level between male and female laborers. Women contributed a small amount but a significant proportion of their family income and the socioeconomic status of the women farm and rice mill laborers should be improved

through direct participation in income generating activities by reducing the male and female discriminations.

Raihan *et al.*, (2018) indicates the importance of a number of socioeconomic factors in the decision to choose unpaid work as opposed to paid activities. For example, occupation of the household head (head being self-employed) along with greater landholding has a strong positive effect on the decision to work as an unpaid worker; the opposite holds true for paid work. Having university education although reduces the probability to work as unpaid, primary or secondary education tends to have a positive effect on a household's decision to work as unpaid. Unpaid work is more prevalent among those who are married and relatively older.

Men and women have different rights to the same asset, men tend to have more and stronger rights than women. For example, a wife often has the right to use her husband's land (for example, Gilligan, Kumar, McNiven, Meenakshi, & Quisumbing, 2013; van den Bold, Pedehombga, Ouedraogo, Quisumbing, & Olney, 2015).

Women control milk for home consumption, but men control income from milk sales to collection centers (Johnson, Njuki, Waithanji, Nhambeto, Rogers & Kruger, 2015).

Women can use a pump but not loan it out to others without permission (Njuki, Waithanji, Sakwa, Kariuki, Mukewa, & Ngige, 2014).

Zaman, 1995; Seymour and Floro *et al.*, (2016) said that although norms of seclusion and traditional limitations on women's mobility outside the home (*purdah*) persist and women retain predominant responsibility for household work women's participation in the agricultural labor force has increased notably from less than 20 percent in 1999 to nearly 41 percent in 2010. When women marry, they typically go to live in their husband's family's household, forming extended households, where they are expected to contribute significantly to domestic chores. Mothers-in-law, present in 13 percent of our sample, play a role in childcare and domestic work, potentially alleviating the mothers' workload, but also presenting the possibility of conflicts in decision making owing to their higher status within the household. Many women express positive subjective feelings about providing care work, negotiating an identity as a good mother, daughter-in-law, and wife, which could reinforce their concentration on this time use category (Seymour and Floro, 2016; Devine 2008; Camfield 2008).

Ferdous *et al.*, (2017) said that rural women in Bangladesh are not allowed to go outside of their houses without the permission of the male family members. They usually have to take male family members in case of going anywhere outside their home.

Rahman *et al.*, (2016) observed that the distance of agricultural fields (where they work) from home, the number of available technologies used and the number of available male adults within the family were found affecting the women's decision to work in the field.

Schuler *et al.*, (2010) have conducted a study on “Women’s empowerment revisited: a case study from Bangladesh”. This article explores the changing dimensions of women's empowerment over time in three Bangladesh. The article discusses theoretical issues related to the measurement of women's empowerment, and describes findings from a recent study in the villages exploring the current salience of indicators developed for a 1992 survey. In the article the types of social, economic, and political change that affect the measurement of women’s empowerment are discussed; a new set of indicators for the rural Bangladesh setting is proposed and explained; and implications for measuring women's empowerment in other settings also discussed.

Haque. *et al.*, (2011) had conducted a study on „Women Empowerment or Autonomy: A Comparative View in Bangladesh Context“. This study attempts to measure and distinguish women empowerment and autonomy from each other by constructing indices in three specific dimensions namely economic decision making, household decision making, and physical movement in Bangladesh context. The level of women autonomy decreases with the increase of education whereas education increases the level of women empowerment but not smoothly. Women’s current age, place of residence, education, religion, media exposure etc. are the important factors affecting women empowerment and their autonomy.

CHAPTER III METHODOLOGY

Methodology of the Study

The thesis study conducted by primary cross-sectional data for analysis. The primary data set included both quantitative data and qualitative data. As the quantitative component, the study was conducted at a household level survey. Thus, the quantitative data was generated mainly by household surveys with a constructive questionnaire.

3.1 Sampling Design

3.1.1 Sample Area

This study was conducted in Six upzilla named by, Gangachara and Mithapukur from Rangpur district, Dinajpur Sadar and Fulbari from Dinajpur district, Sherpur and Adamdighi from Bogura district of Bangladesh. The reason for selecting six upazilla was mainly to observe the differences in participation of women in various agricultural activities in the different areas of northern part of Bangladesh. These areas were selected for availability of data about women participation in agriculture.

3.1.2 Units of Analysis

“Simple Random Sampling” method was used to select a total number of 80 households from Six upzilla from three district namely Rangpur, Dinajpur and Bogura. They were selected randomly and interviewed.

Table 3.1 Districts and Upazillas for Survey

Sl. No.	Districts	Sample Upazilas surveyed	
		Name of Upazilla	Numbers
1	Rangpur	i. Gangachara, and ii. Mithapukur	25
2	Dinajpur	i. Dinajpur Sadar, and ii. Fulbari	25
3	Bogura	i. Sherpur, and ii. Adamdighi	30
Total	3	6	80

3.1.3 Units of Observation

This present study purposively considered mainly the household rural women as the units of observation or the respondents.

3.1.4 Survey Instrument

A well-thought and well-designed interview schedule were prepared for conducting the household level survey. The interview schedule included sample questions in different modules to record sufficient data and information from the households.

3.2 Variables

Data and information were obtained on the following group of variables:

- Patterns of ownership/assets owned
- Occupational status
- Educational qualification
- Demographic status
- Family/ own income
- Household expenditure
- Time spends in household agriculture
- Working Pattern in outside
- Problems faced in the way to work place and in the work place
- Wage discrimination.
- Women's access to decision making
- Training Facility
- Women's access to investment
- Access to credit and utilization.

3.3 Analytical Tools

The proposed study planned to adopt both descriptive and inferential statistical tools and techniques for analyzing the data set to be generated by the study. The major descriptive tools and techniques were taken are measurement of central tendency, tabulation, cross-tabulation, graphing, indexing etc. On the other hand, as an inferential statistical technique, the study was applied the widely used multivariate regression analysis and factor analysis to identify the determinants of influencing factors for

participating in agricultural activities and determine the empowerment index through agricultural development at household level.

Factor analysis is a multivariate statistical technique that addresses itself to the study of interrelationships among a total set of observed variables. The technique allows looking at groups of variables that tend to be correlated to one another and identify underlying dimensions that explain these correlations. While in multiple regression model, one variable is explicitly considered as depended variable and all other variables as predictors; in factor analysis all the variables are considered as depended variables simultaneously. In a sense, each of the observed variables is considered as a depended variable that is a function of some underlying, latent and hypothetical set of factors. Conversely, one can look at each factor as depended variable that is a function of the observed variables.

If $\{X_1, X_2, \dots, X_n\}$ be a set of n observed variables and $\{F_1, F_2, \dots, F_m\}$ be a set of unobservable variables then the factor analysis model can be expressed as

$$\begin{aligned} X_1 - \mu_1 &= l_{11}F_1 + l_{12}F_2 + \dots + l_{1m}F_m + \varepsilon_1 \\ X_2 - \mu_2 &= l_{21}F_1 + l_{22}F_2 + \dots + l_{2m}F_m + \varepsilon_2 \\ &\dots \\ &\dots \\ X_n - \mu_n &= l_{n1}F_1 + l_{n2}F_2 + \dots + l_{nm}F_m + \varepsilon_n \dots \dots \dots (1) \end{aligned}$$

Where, μ_i is mean of X_i , ε_i is error or specific factor. The coefficient l_{ij} is the loading of i -th variable on the j -th factor. In matrix notation the factor analysis model can be expressed as

$$X - \mu = LF + \varepsilon \dots \dots \dots (2)$$

Where, $L_{n \times m}$ is the matrix of factor loadings.

Several methods are available in literature to estimate factor loadings factor scores. The study considered principal component method to estimate the factor loadings and communalities

$[h_i^2 = \sum_{j=1}^m l_{ij}^2]$ measure of the variation of observed variables through factors. Several factor rotation methods like Varimax, Quartimax are adopted to find better estimates of factor loadings.

Data were collected using a standard questionnaire. Both qualitative and quantitative data were analyzed and interpreted to obtain the results. The status and quality of participation of women in agricultural activities were assessed by constructing an empowerment index. The socioeconomic characteristics, income, credit, influencing factors and constraints etc. also examined.

3.4 Women Empowerment Index (WEI)

In this age of rapid development in all of the fields throughout the world participation of the women is part and parcel in the development process. There are many worldwide approved approaches of participation of the women in the development. But in the developing country like ours, they face formidable social, political, cultural and economic barriers. There are mainly two reasons for that:

- Attitudes of the society to consider women as second-class citizen and
- Tendency of considering women as the weaker counterparts

The women movements in many countries have taken place for their rights. The women development and women empowerment are the results of the women movements. Women of today are getting the results. Power is measured as the root of empowerment. Women's participation, their decision-making capacity, control over resources, their self-respect and perceptions, ability to take shelter of law are the major factors of women empowerment. To what extent the economic activities help woman to be empowered is the prime concern of the present study. For this to see whether economic participation improves women empowerment or not, ten variables from each of two phases: agricultural and non-agricultural activities will be selected to develop a women empowerment index (WEI). Each of the ten variables can take any of the five attributes for each respondent, which represents the relative position of the respondent in her ability and opportunity to take active part in family's decision-making process. The range is discrete and a value close to 5 shows higher empowerment. These attributes are chronologically presented below:

1 = decision is made by other members in husband's absence

2 = by husband without consultation with the wife

3 = by wife in husband's absence

4 = jointly by husband and wife, or with others in husband's absence

5 = by wife even when husband is present

The rating values of the decision-makers have been assigned according to the weight in favor of the female in two categories, first one weighted averages of factors for agricultural respondents and another one weighted averages of factors for non-agricultural respondents.

Let, K_i = the values of attributes, (1.....5)

X_i = the indicators or factors, (1.....10)

Here, ten intra-household decision making indicators for agricultural respondents are denoted as X1 to X10;

X1 = Land cultivation

X2 = Selection of crop varieties

X3 = Crop Production

X4 = Purchasing agricultural items as fertilizer, seed, insecticides

X5 = Produced crop to consume/ sell

X6 = Produced crop to sell

X7 = Poultry and cattle rearing

X8 = Vegetable cultivation and gardening

X9 = Post harvesting activities

X10 = Agricultural mechanization

And there are also ten intra-household decision making indicators for non-agricultural respondents are denoted as X1 to X10;

X1 = Land sell/buy at what price

X2 = Obtaining credit

X3 = Decision making to conduct the credit

X4 = Whether to purchase household equipment

X5 = Whether to having decision to expend family income

X6 = Children's education

X7 = Marriage decision of the children

X8 = Family planning

X9 = Monetary Management

X10 = Do vote for election

The above statement can be measured through rating of each decision indicator (X _i): X _i = Decision making indicator	K= any rating value of each indicator				
	Low		High		
X ₁	1	2	3	4	5
.
.
.
X _n	1	2	3	4	5

So, $X_i = K_i^-$ (i)

i.e., the average scoring value of X_i (the indicator) for all household will be the average of the value K_i. (Hossain and Bose, 2004)

The researcher used the given value of ten indicators for each household to construct the WEI. At first, the X_i s are summed and measured individual empowerment index WEI_i for each, agricultural and non-agricultural respondents by following formula:

Formula:

$$WEI_i = \sum_{i=1}^{10} X_i / 10 \dots\dots\dots (ii)$$

Then the overall WEI stands for an i-th household as

$$WEI_i = \sum_{i=1}^{80} WEI_i / 80 \dots\dots\dots (iii)$$

Again, to assess the individual empowerment status and position of all women respondents, five randomly defined ranges are arranged as:

Very much vulnerable	below 3.00
Vulnerable	3.01 to 3.50

Moderate	3.51 to 4.00
Quite High	4.01 to 4.50
High	4.51 to 5.00

The rationale for selecting the range in this manner is that, first 1, 2 and 3 remain scarce for all the respondents. That's why the researcher selects the above ranges for perfectly reflecting the situations.

CHAPTER IV

RESULT AND DISCUSSION

Before performing any statistical analysis, it is important to know the background characteristics of the study population or nature of the data. In order to study these characteristics of different variables, it is necessary to focus on the percentage distribution of the considered variables. The percentage distribution demonstrates the pattern of variables and observations in different groups. In this chapter, an attempt has been made to discuss some important characteristics viz., socio-economic status of women's participation in agricultural activities are vital in describing the kind of subjects involved in the study. Their profile can provide the delimitation of the study so that whatever findings brought out of the study can be described within the scope only of this profile.

Consistent with the research objectives "To know the status of involvement in different types of Agricultural activities in rural area" is one of the key research questions of the study was: What are the characteristics of the rural women's empowerment? In order to answer this question, data were collected through structured interviews using a questionnaire. The variables covered include age, marital status, education level, husbands' education level, post educational training, husbands' work, work before participating in different agricultural activities and other sources of income. These variables are analyzed and discussed in the following sub-sections.

4.1 Age Profile of Participant Women Whose are Involved in Agricultural Activities

As Table 4.1 shows that in case of the different types of agricultural participation of female as 72.7% are involved in crop cultivation activities, 59% are in poultry rearing, 50% are in homestead gardening, 40.9% are in cattle rearing and 13.6% are involved in fish hatchery workers respectively fall in the age group 18 to 30 years. Female as 57.1% are involved in crop cultivation activities, 39.3% are in poultry rearing, 85.7% are in homestead gardening, 67.8% are in cattle rearing and 7.14% are involved in fish hatchery workers respectively fall in the age group 31 to 50 years. 37.5%, 25%, 62.5%, 25% and 12.5% women are involved in crop cultivation activities, poultry rearing, homestead gardening, cattle rearing and fish hatchery work respectively fall in the age group 51 years to above. From the total 80 number of female participants from the

data analysis result we found that, 55% are fall in the age group 18 to 30 years, 35% are fall in the age group 31 to 50 years and 10% are in the age group 51 to

Source: Field Survey, 2020

Table 4.1: Age Profile of Participant Women in Agriculture

Groups	Type of Agricultural Activities						
	Crop Cultivation	Poultry Rearing	Homestead Gardening	Cattle Rearing	Fish Hatchery	Total	
	(%) (No)	(%) (No)	(%) (No)	(%) (No)	(%) (No)	Respondents	(%)
18-30 Years	72.7% (32)	59% (26)	50% (22)	40.9% (18)	13.6% (6)	44	55%
31-50 Years	57.1 % (16)	39.3% (11)	85.7% (24)	67.8% (19)	7.14% (2)	28	35%
51-Above	37.5% (3)	25% (2)	62.5% (5)	25% (2)	12.5% (1)	8	10%
Total						80	100

The following results indicate that in case of rural economic activities as crop cultivation activities are maximum respondents that are 55% fall in the group 18-30 years which is young age. This means that young aged women are involved in agricultural economic activities more which suggest that at this age the respondents are as strong as being young and hard worker to earn for themselves or for their family purpose. In this age, they can give their effort more as working hour and have the mental and physical strength to support income for family so women get easily involved in agricultural activities as well as poultry rearing, vegetable cultivation, gardening beside home, cattle bearing ad fish hatchery related work etc.

Again 35% of the respondents of the female fall in the age group 31 to 50 years. Most of these middle stage women are involved in homestead gardening, cattle bearing which are near home based so that women can engage in earnings beside the household activities.

Almost 62.5% respondents of rural women are involved in homestead vegetable gardening from the age group above 51 years. These above findings indicate that women at the young age limit as 18 to middle stage age below the 30 are mostly

involved in different economic activities in rural areas where and above the age 51 are less involved in the income generating activities.

4.2 Education Status of Participant Women in Agriculture

It can be easily seen from the table 4.2 that maximum rural women were 40% of all the respondents have their education up to secondary stage and almost 27.5% of all the respondents have completed their primary education. Almost 22.5% of the respondents have no formal education and only 7.5% of the respondents have studied up to the higher secondary education. 2.5% of the respondents have completed their Graduation. Data shows that in study area there are 2.5% of the respondents who work in fish hatchery.

Table 4.2: Education Status of Participant Women in Agriculture

Education level	Type of Agriculture Activities					
	Crop Cultivation	Poultry Rearing	Homestead Gardening	Cattle rearing	Fish Hatchery	Total
	% (No)	% (No)	% (No)	% (No)	% (No)	(%) (No)
No Formal Education	83.3% (15)	27.8% (5)	66.7 % (12)	55.6% (10)	16.7% (3)	22.5% (18)
Primary Education	81.8% (18)	22.7% (5)	59.1% (13)	45.5% (10)	9.1% (2)	27.5% (22)
Secondary Education	78.1% (25)	56.3% (18)	53.1% (17)	40.6% (13)	-	40% (32)
Higher Secondary Education	2.5% (2)	50% (4)	50% (4)	-	3.75% (3)	7.5% (6)
Graduation To Above	-	-	50% (1)	-	2.5% (2)	2.5% (2)

Source: Field Survey, 2020

It is clearly visible that education plays a critical role in the economic development. About 40% of the respondents whose are completed their secondary education with primary education 22.5%, have maximum involvement in different agricultural activities. This finding suggests that literate women are now engaging in economic activities with caring their family, children with more responsibilities. Because, they find the way to do earn more suitable for themselves and can take it as their earning source for self- sufficiency. Almost 22.5% of the respondents have no formal education but they are mostly involved in all sectors of agricultural activities, mostly in crop cultivation activities. These results indicate that the respondents from the rural area are comparatively less educated but trying so hard to do income generating activities

mostly. One of the reasons for this situation may be that family bindings with social thoughts are the most common responsibilities of the women generally, so that women with little education with the spirit of self-motivation can do economic activities more successfully. As economic activities do not demand qualification of the higher education so women who are deprived of the higher education for some reason can take more empowerment opportunity for their life.

4.3 Agricultural Training Profile of Participant Women in Agriculture

From the table 4.3 it is seen that less than half total number of the respondents have taken either professional training or attended courses conducted by relevant disciplines and maximum as more than half of total did not take part in any kind of training or professional courses.

Table 4.3: Agricultural Training Profile of Participant Women in Agriculture

Agricultural Training/course attendant	Type of Agricultural Activities					
	Crop Cultivation	Poultry Rearing	Homestead Gardening	Cattle Rearing	Fish Hatchery	Total
	% (No)	% (No)	% (No)	% (No)	% (No)	No
Yes	42.5% (34)	27.5% (22)	41.3% (33)	40% (32)	22.5% (18)	80
No	57.5% (46)	72.5% (58)	58.8% (47)	60% (48)	77.5% (62)	80

Source: Field Survey, 2020

The data from table shows that, 42.5% of the respondents of the crop cultivation activities have taken training and 57.5% did not receive any training. Otherwise in case of the respondents from the rural area only 27.5% have training and 72.5% have no training in poultry rearing. About 41.3% of the respondents of the homestead gardening has taken It was remarkable that, in rural area women in fish hatchery or farming related activities do not get proper training as only 22.5% get the training where maximum number about 77.5% of the respondents do not get trainings. From the data collection, it was seen that, different trainings from different “Krishak Math School” as “Integrated Farm Management Component (IFMC)” organized by Department of Agricultural Extension (DAE) are training where 58.8% did not receive any training. In cattle rearing activities, 40% get different training where maximum as 60% get no training. doing influential activities by providing training on crop cultivation activities, homestead

gardening and other economic activities. Because of innovation of different new variety of crops, cropping patterns, equipment, fertilizers, demand perfectness and practice so training in this field is compulsory for the rural women.

4.4 Participant Women’s Husband’s Education Status

The table 4.4 clearly indicates 2.5% of the respondents’ husbands have education up to graduation or above, 6.3% have higher secondary education, 36.3% have secondary education, 31.3% have primary education and 23.8% have no formal education.

Table 4.4: Participant Women’s Husband’s Education Status

Spouse's Education	Type of Agricultural Activities					
	Crop Cultivation	Poultry Rearing	Homestead Gardening	Cattle Rearing	Fish Hatchery	Total
	% (No)	% (No)	% (No)	% (No)	% (No)	% (No)
No Formal Education	94.7% (18)	15.8% (3)	10.5% (2)	31.6% (6)	10.5% (2)	23.8% (19)
Primary Education	55% (14)	28% (7)	24% (6)	52% (13)	8% (2)	31.3% (25)
Secondary Education	37.9% (11)	20.7% (6)	13.8% (4)	29.6% (8)	17.2% (5)	36.3% (29)
Higher Secondary Education	20% (1)	40% (2)	20% (1)	20% (1)	60% (3)	6.3% (5)
Graduation to above	-	-	-	50% (1)	50% (1)	2.5% (2)

Source: Field Survey, 2020

The data from the table shows that, maximum respondents’ husband involved in crop cultivation activities who have completed up to secondary education. And the number of completed graduation or above is so low with no contribution to economic activities. These apparently suggest that most of the respondents have average educated husbands which may have influence in their income generating activities.

4.5 Participant Women’s Husband’s Occupation Status

It is seen from the table 4.5 that total 48.8% of the husbands of the rural women are employed, 6.3% are unemployed, 26.3% are businessman and 18.75% of the husbands of the rural women are doing seasonal works as well as retired or doing others activities.

Table 4.5: Participant women’s Husband’s Occupation status

Spouse's Occupation	Type of Agricultural Activities					
	Crop Cultivation	Poultry Rearing	Homestead Gardening	Cattle Rearing	Fish Hatchery	Total
	(%) (No)	(%) (No)	(%) (No)	(%) (No)	(%) (No)	(%)
Employed	71.8% (28)	12.8% (5)	-	7.7% (3)	7.7% (3)	48.8% (39)
Unemployed	-	-	-	-	-	6.3% (5)
Business-man	57.1% (12)	14.3% (3)	-	17.6% (3)	14.3% (3)	26.3% (21)
Retired/ Others	60% (9)	-	20% (3)	6.7% (1)	16.7% (2)	18.75% (15)

Source: Field Survey, 2020

Almost maximum number of respondent rural women’s husbands are largely involved in different crop cultivation activities as employed, businessmen and others respectively 71.8%, 57.1% and 60% where in fish hatchery related work, cattle rearing, poultry rearing activities person is so low in amount.

4.6 Asset Ownership of the Participant

From table 4.6 it is observed that 68.8% of the assets and related properties are owned by the rural women’s husband where personally owned by the rural women percentage is so low as 8.8%.

Table 4.6: Asset Ownership of the Participant Women in Agriculture

Ownership	Type of Agricultural Activities					
	Crop Cultivation	Poultry Rearing	Homestead Gardening	Cattle Rearing	Fish Hatchery	Total
	% (No)	% (No)	% (No)	% (No)	% (No)	% (No)
Owned personally	33.3% (2)	16.7% (1)	33.3% (2)	16.7% (1)	16.7% (1)	8.8% (7)
Jointly owned with husband	54.5% (6)	18.2% (2)	18.2% (2)	9.1% (1)	-	13.8% (11)
Owned by husband	74.5% (41)	5.5% (3)	5.5% (3)	7.3% (4)	9.1% (5)	68.8% (55)
Jointly owned with other family members	42.9% (4)	28.6% (2)	14.3% (1)	-		8.8% (7)

Source: Field Survey, 2020

Asset or related properties of doing different crop cultivation activities, poultry rearing, homestead cultivation land, cattle rearing, fish pond are maximum owned by the rural women husband as 74.5%, 5.5%, 5.5%, 7.3%, 9.1% and as total 68.8% respectively. On the other side, personally owned property rate by the rural women is so low as only 8.8% of total percentage. There is some contribution of rural women with jointly owned by their husband in agricultural asset 54.5%, poultry farming 18.2% and vegetable cultivation land 18.2% and cattle rearing is 9.1%. Jointly owned with other family members in agricultural asset 42.9%, poultry farming 28.6% and fish pond 14.3% and as total percentage is only 8.8%. Regarding the factors that described in this chapter, the study elaborated that, the rural women's participation in different agricultural activities are expanded with the family and social awareness in our society. Education qualification with different technical trainings create different income generating activities through the rural women participation.

4.7 Factor Analysis for Determination of Influencing Factors for Enhancing the Women Empowerment

The present study adopted factor analysis to identify the major dimensions of influencing factors for enhancing the women empowerment that explain most of the

variance observed in a much larger number of manifest variables by reducing the number to a few factors. The factor analysis used principal component method to extract the factors with Varimax rotation technique. The table 4.7 show the results of the factor analysis influencing factors for enhancing the women economic activities as women empowerment. The selection of a particular variable to be included as a factor was made on the basis of whether the correlation value (factor loadings) was high or not. On the basis of the maximum variation of the factors the study identified four main factors as the influencing factors for enhancing the women empowerment. These factors are:

Factor I (Freedom of Decision Making):

Decision about different income generating activities, crop production decision for consumption, crop production decision for selling and earnings, decision making for cattle rearing & poultry farming, decision making for fish hatchery and cultivation and decision for vegetable cultivation and gardening.

Factor II (Economic Independency):

Savings, own income, ownership of assets, family income.

Factor III (Demographic Characteristics):

Age, education, spouse's education, spouse's occupation, course attended, family size.

Table 4.7.1: Factor Analysis for Influencing Factors for Enhancing the Rural Women Empowerment (Desire of Decision-Making Freedom)

Influencing Factors for Enhancing the Rural Women Economic Activities	Factors					
	F1	F2	F3	F4	F5	F6
Crop Production Decision for Consumption	0.919	-0.172	-0.044			
Crop Production Decision for Selling and Earnings	0.896	-0.040	-0.131			
Decision Making for Cattle Rearing and Poultry Farming	0.642	-0.033	0.093			
Decision Making for Fish Hatchery and Cultivation	0.095	0.725	0.412			
Income Generating Activities	0.215	0.785	-0.041			
Vegetable Cultivation and	0.075	-0.304	0.909			
Eigen Value	2.120	1.267	1.025	0.78	0.647	0.153
Percent of Variation	35.335	21.110	17.07	13.1	10.778	2.547
Cumulative Percent of Variation	35.335	56.445	73.52	86.6	97.453	100.00
KMO= 0.537, Bartlett's Test of Sphericity (Approx. Chi-Square) = 91.052 has been shown in the table						

Source: Field Survey, 2020

*Extraction Method: Principal Component Analysis

*Rotation Method: Varimax with Kaiser Normalization

The elements of each of the factors are arranged in order of their respective magnitude (absolute) of the factor loadings indicating the importance of a particular element in a factor. The influencing factors comprising Factor I are mainly related to “Freedom of Decision Making” which influence to take participation in different income generating activities as their way to become empowered.

From the table 4.7.1, it is observed that the group of factors of desire for decision making freedom: decision about different income generating activities, crop production decision for consumption, crop production decision for selling and earnings, decision making for cattle rearing and poultry farming, decision making for fish hatchery and cultivation and decision for vegetable cultivation and gardening and use of income etc. are the most important factors influencing women participation in different economic activities as well as women empowerment. From the result of the table 4.7.1, it is observed that among the group of factors of desire for decision making freedom, crop

production decision for consumption is the most influential factor where the second important factor is the freedom for decision making at vegetable cultivation and gardening. Freedom in decision making for crop production decision for selling and earnings is also an influential factor for rural women empowerment. The result suggests that mainly these three important factors covered total 73.5% of variation as the most influencing factor among the groups of the factors.

Table 4.7.2: Factor Analysis for Influencing Factors for Enhancing the Rural Women Participation in Different Economic Activities as well as Women Empowerment (Economic Independency)

Influencing Factors for Enhancing the Rural Women Empowerment	Factors				
	F1	F2	F3	F4	F5
Family Income	0.811	0.159	-0.053		
Own Income	-0.357	0.564	-0.254		
Family Savings	0.646	-0.300	-0.329		
Own Savings	0.282	0.799	-0.141		
Ownership of Asset	0.228	0.184	0.899		
Eigen value	1.334	1.105	1.002	0.906	0.653
Percent of variation	26.671	22.093	20.050	18.118	13.068
Cumulative percent of variation	26.671	48.764	68.814	86.932	100.000
KMO= 0.468, Bartlett's Test of Sphericity (Approx. Chi-Square)=8.407 has been shown in the table.					

Source: Field Survey, 2020

*Extraction Method: Principal Component Analysis

*Rotation Method: Varimax with Kaiser Normalization

The elements of each of the factors are arranged in order of their respective magnitude (absolute) of the factor loadings indicating the importance of a particular element in a factor. The influencing factors comprising Factor II are mainly related to “Economic

Independency” which influences to take participation in different income generating activities as their way to become empowered.

From the table 4.7.2, it is observed that the group of factors of economic independency: family income, own income, family savings, own savings, ownership of asset etc. are the most important factors influencing women participation in different economic activities as well as women empowerment.

From the result of the table 4.7.2, it is observed that among the group of factors of economic independency, for the ownership of asset is the most influential factor where the second important factor is the family income. Own savings as economic independency is also an influential factor for rural women empowerment. The result suggests that mainly these three important factors covered almost 70% of variation as the most influencing factor among the groups of the factors.

Table 4.7.3: Factor Analysis for Influencing Factors for Enhancing the Rural Women Empowerment (Demographic Characteristics)

Influencing factors for Enhancing the Rural Women Empowerment	Factors					
	F1	F2	F3	F4	F5	F6
Age	-0.713	-0.486				
Education	0.814	0.143				
Spouse’s Education	0.753	-0.172				
Spouse’s Occupation	0.572	0.049				
Course Attended	-0.232	0.749				
Family Size	-0.378	0.496				
Eigen Value	2.263	1.096	0.982	0.749	0.530	0.378
Percent of Variation	37.728	18.252	16.392	12.485	8.841	6.302
Cumulative Percent of Variation	37.738	55.980	72.373	84.857	93.698	100.000
KMO= 0.665, Bartlett's Test of Sphericity (Approx. Chi-Square) = 59.417 has been shown in the table						

Source: Field Survey, 2020

*Extraction Method: Principal Component Analysis

*Rotation Method: Varimax with Kaiser Normalization

The elements of each of the factors are arranged in order of their respective magnitude (absolute) of the factor loadings indicating the importance of a particular element in a factor. The influencing factors comprising Factor III are mainly related to “Demographic Characteristics” which influence to take participation in different

income generating activities as their way to become empowered. From the table 4.7.3, it is observed that the group of factors of demographic characteristics: own educational qualification, spouse's education, spouse's occupation, course attended, family size etc. are the most important factors influencing women participation in different economic activities as well as women empowerment.

From the result of the table 4.7.3, it is observed that among the group of factors of demographic characteristics, own educational qualification is the most influential factor where the second important factor is the spouse's educational qualification. Attended in different courses is also an influential factor for rural women empowerment. The result suggests that mainly these three important factors covered a total 72.4% of variation as the most influencing factor among the groups of the factors.

In the context of Bangladesh, the rural women here are coming forward accepting challenges of the different economic activities besides men. There are some factors which influenced them most. The freedom of decision making in the important spheres of their lives is the leading influencing factors. When they are empowered by participation in income generating activities or other economic activity, they get more importance in the decision making, they feel proud because of that feeling they have equal importance in the family. Craving for economic independence is another influencing factor because women feel the necessity of money although she is always guaranteed by husband that every need of her will be fulfilled but in reality, doing this, they think they are subordinated by the male counterpart. The reason for that is that she has to depend on her husband for every single need. There are some demographic characteristics that influence rural women to be empowered among them: education, spouse's education, spouse's occupation etc. Education of the women influences them to engage in economic activity in this case the educated women enhance as their source of income.

4.8 The Women Empowerment Index (WEI)

The empowerment index is measured to know the overall empowerment status of all the respondents and for a better understanding of women empowerment through different economic activities. To find the status and quality of women's involvement in agricultural activities, ten variables are selected in each two phase as agricultural

activities and non-agricultural activities. Agricultural Activities classified by their weighted average for comparing among themselves.

The average empowerment over the whole sample for each of the 10 factors can also be checked. The rating values of the decision-makers have been assigned according to the weight in favor of the female,

Let, K_i = the values of attributes, (1.....5)

X_i = the indicators or factors, (1.....10)

Here, ten intra-household decision-making indicators for agricultural respondents are denoted as X_1 to X_{10} ;

X_1 = Land cultivation

X_2 = Selection of crop varieties

X_3 = Crop Production

X_4 = Purchasing agricultural items as fertilizer, seed, insecticides

X_5 = Produced crop to consume/ sell

X_6 = Produced crop to sell

X_7 = Poultry and cattle rearing

X_8 = Vegetable cultivation and gardening

X_9 = Post harvesting activities

X_{10} = Agricultural mechanization

Table 4.8.1: Weighted Averages of Factors for Agricultural Activities

Factors	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
E(xi)	3.53	3.21	3.50	2.46	3.97	3.20	3.98	4.32	3.95	3.55

As defined earlier the factors X_1 to X_{10} are in general associated with agricultural economic and production related fields. These activities are influential with the participation of men as household activities. These are the factors relating major productive decisions of a family. From the factor X_1 to X_6 are concerned about decision regarding land cultivation, selection of crop varieties, crop production, purchase of agricultural substitutes (fertilizers, insecticides etc.), crop production for consumption

and crop production for sell. These factors are closely related with the agricultural activities which score as from 3.53, 3.21, 3.5, 2.46, 3.97 and 3.20. These indicate that women are almost get the priority to take any agricultural related decision with supporting of the male persons.

The factors X_7 to X_{10} are regarding cattle and poultry rearing, vegetable cultivation and gardening, post harvesting activities, agricultural mechanization respectively which scores 3.98, 4.32, 3.95 and 3.55 that means they have quite high participation in taking decision independently in these activities and X_8 is regarding about vegetable cultivation and gardening and scores highest as 4.32 that means that the rural women respondents who are involved in agricultural activities, have quite high freedom of taking decision in vegetable gardening.

Now another types of economic activities which is mentioned as “Non-agricultural Activities” classified by their weighted average for comparing among themselves. The average empowerment over whole sample for each of the 10 factors can also be checked.

The rating values of the decision-makers have been assigned according to the weight in favor of the female,

Let, K_i = the values of attributes, (1.....5)

X_i = the indicators or factors, (1.....10)

Here, ten intra-household decision-making indicators for agricultural respondents are denoted as X_1 to X_{10} ;

X_1 = Land sell/buy at what price

X_2 = Obtaining credit

X_3 = Conduct the credit

X_4 = Whether to purchase household equipment

X_5 = Whether to having decision to expend family income

X_6 = Children’s education

X_7 = Marriage decision of the children

X_8 = Family planning

X9 = Monetary Management

X10 = Do vote for election

Table 4.8.2: Weighted Averages of Factors for Non-Agricultural Activities

Factors	X₁	X₂	X₃	X₄	X₅	X₆	X₇	X₈	X₉	X₁₀
E(xi)	3.12	4.03	3.30	4.12	3.69	4.05	3.95	3.89	3.58	3.88

As defined earlier the factors X₁ to X₁₀ are in general associated with non-agricultural economic activities which are not professional and are directly related to internal decision of the family. These are the factors relating major economic decisions of a family. From the factor X₁ to X₃ are about decision regarding concerned land sell/buy at what price, obtaining credit, conduct the credit. These factors are non-agricultural economic activities as credit or loan purpose closely related with the agricultural activities which scores are as from 3.12, 4.03 and 3.30. These indicate that women are almost get the priority to take any credit or loan related decision with supporting of the male persons.

The factors X₄ to X₁₀ are regarding whether to purchase household equipment, whether to having decision to expend family income, children's education, marriage decision of the children, family planning, monetary management and do vote for election respectively which scores 4.12, 3.69, 4.05, 3.95, 3.89, 3.58 and 3.88 that means they have quite high participation in taking decision independently in family related activities.

The non-agricultural factors are really a critical factor for the study. The reason of criticality can be explained from our perspective of societal settings. Firstly, our families in this modern age also carry paternal mentality regarding spending of money. Secondly, majority of the population here is the follower of the religion Islam in which restricts to some extents spending of money by the women themselves. Finally, the psychological side, it is deeply rooted both the mentality of male and female that female cannot properly handle the expenditures, she can take wrong decisions regarding this and again as she is not earning, her husband is earning so she has no rights of spending her husband's income. In this context, X₄ factor carries the value 4.12 about decision taking freedom regarding to purchase household equipment which is obviously high

than the average empowerment value. This means that in the patriarchic society although women are empowered but this is not enough for taking important family decisions.

By applying the method to measure the empowerment index, the overall empowerment index is 3.66. The empowerment index for the respondents who are involved in agricultural activities is found as 3.56 and for the respondents who are involved in non-agricultural activities the empowerment index is 3.76.

Table 4.8.3: Women Empowerment Index

Type of the Empowerment	Average Empowerment
Agricultural Activities	3.56
Non-agricultural Activities	3.76
Average	3.66

The results (Table 4.8.3) clearly indicate the fact that average empowerment of the rural women through non-agricultural activities is 3.76 which is quite high than the findings of another's. One thing should be cleared here that the present study is in the capital of Bangladesh and the rural women who are involved in different economic activities as agricultural activities and non-agricultural activities operating as empowerment get the highest facilities which may be in terms of communication, availability of bank or other loans, location advantages. They are doing income generating activities overcoming all kinds of odds and hustles. This is obvious they are more empowered than other women who are not involved in the rural areas. But the thing is that in the empowerment scale it is not maximum and it is not enough today's world of hard and tough competition.

CHAPTER V

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Bangladesh is an agricultural country. Economy of Bangladesh largely depends on agriculture. Many people are mainly involved directly or indirectly in agricultural activities. Because it is the source of employment, livelihood, and food security for many people. In the Agricultural sector, men as well as women are participating. Family women play a significant and crucial role in agricultural development as well as family income generation in Bangladesh. This study also helps to assess the women participation in agriculture, impact on family by accelerating income, and empowerment of women. Women participation in agriculture is increasing day by day. They not only participate in agricultural activities but also make decisions in this sector. The study confirms earlier findings that the rural women are segregated to home-based activities consisting of mainly domestic labor and less economic labor.

From the above discussion, we can show that in case of the different types of agricultural participation of female as 72.7% are involved in crop cultivation activities, 59% are in poultry rearing, 50% are in homestead gardening, 40.9% are in cattle rearing and 13.6% are involved in fish hatchery workers respectively fall in the age group 18 to 30 years. From the total 80 number of female participants from the data analysis result we found that 55% are fall in the age group 18 to 30 years, 35% are fall in the age group 31 to 50 years and 10% are in the age group 51 to above. About 40% of the respondents who completed their secondary education with primary education 22.5%, have maximum involvement in different agricultural activities. This finding suggests that literate women are now engaging in economic activities with caring their family, children with more responsibilities. 58.8% did not receive any training. In cattle rearing activities, 40% get different training where maximum as 60% get no training doing influential activities by providing training on crop cultivation activities, homestead gardening and other economic activities. 48.8% of the husbands of the rural women are employed, 6.3% are unemployed, 26.3% are businessman and 18.75% of the husbands of the rural women are doing seasonal works. 68.8% of the asset and related properties

are owned by the rural women's husband where personally owned by the rural women percentage is as low as 8.8%.

Factors influencing women in participation of agriculture is most important. The factors X_4 to X_{10} are regarding whether to purchase household equipment, whether to having decision to expend family income, children's education, marriage decision of the children, family planning, monetary management and do vote for election respectively which scores 4.12, 3.69, 4.05, 3.95, 3.89, 3.58 and 3.88 that means they have quite high participation in taking decision independently in family related activities. By applying the method to measure the empowerment index, the overall empowerment index is 3.66. The empowerment index for the respondents who are involved in agricultural activities is found as 3.56 and for the respondents who are involved in non-agricultural activities the empowerment index is 3.76.

In recent years, several changes are observed that have interesting policy implications. First, total burden of work for women has decreased mainly due to a reduction in domestic work. Secondly, women's participation in agriculture as well as non-agricultural activities. They participate in agricultural activities that helps to earn money for supporting their family. Thirdly, there is substantial disparity in earnings of men and women in the labor market that may be explained by occupational segregation and low education of women. For this reason, they can't take decision for agricultural activities/ farming largely. Income gap between men and women is decreasing through participation of women in agricultural activities as well as income generating activities. One of the main reasons behind low empowerment of women is the gender division of labor that keeps them segregated to home. Economic activities within the household chores have been found to have a weak impact on empowerment.

Women's participation in economic, social, political, and cultural agendas remains a challenge in a developing country. Women in rural area of Bangladesh are engaged in a variety of agricultural activities like crop cultivation, post-harvest management of crops, seed production and preservation, livestock and poultry raising homestead gardening, intercultural operations. This study concludes that without active participation of the rural women, the contribution of the agricultural sector to GDP will lag behind. Different awareness building and income generating facilities, then the participants will achieve dual benefit and their participation in economic activities and decision-making role will increase.

5.2 Recommendation

However, there are still some problems faced by women empowerment through participating in agricultural activities which need attention from the government along with various supporting activities of the society. There are some recommendations for improving the women participation in agriculture of Bangladesh.

- Government subsidy is also provided for women farmers but Here some mismanagements also occurred as a result they cannot reach the subsidy that the government announced for them. So, policy makers should rethink the system of providing subsidies.
- Training on different agricultural activities or providing different technical knowledge for involving in agricultural activities. Different certified course procedures should be simplified.
- Establishing a strong network among different institutions, NGOs and agencies involved in the development of the women in general and sharing their experiences.

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