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Contribution of Women in Homestead Agricultural Production in Rajshahi District of Bangladesh

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University of Rajshahi

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**CONTRIBUTION OF WOMEN IN HOMESTEAD
AGRICULTURAL PRODUCTION IN RAJSHAHI
*DISTRICT OF BANGLADESH***



Ph.D. THESIS

BY

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B.Sc. Ag. (Hons.)

M.S.in Agricultural Extension Education

JULY, 2007

AGRICULTURAL EXTENSION LABORATORY
DEPARTMENT OF AGRONOMY AND
AGRICULTURAL EXTENSION
UNIVERSITY OF RAJSHAHI
RAJSHAHI
BANGLADESH

**CONTRIBUTION OF WOMEN IN HOMESTEAD
AGRICULTURAL PRODUCTION IN RAJSHAHI
DISTRICT OF BANGLADESH**



A THESIS SUBMITTED FOR THE DEGREE
OF
DOCTOR OF PHILOSOPHY
IN THE
DEPARTMENT OF
AGRONOMY AND AGRICULTURAL EXTENSION
UNIVERSITY OF RAJSHAHI, BANGLADESH

BY

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JULY, 2007

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DEDICATED

TO

MY DEPARTED FATHER-IN-LAW

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DECLARATION

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The Author

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ABSTRACT

The study was carried out to determine the extent of contribution of women in selected homestead agricultural activities viz. homestead vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation. An attempt was made to explore relationships of 16 independent variables of the women with their contribution. The study also investigated the contributions as well as direct and indirect effects of the selected variables to women's contribution. Data were collected from a sample of 200 women of 4 villages from 2 unions of 2 Upazilas under Rajshahi District. Four villages were selected through multistage and stratified random sampling and population were identified based on their landholding size in the study year. The farm families were categorized into marginal, small and medium farmer. Ten percent of the population was randomly selected from each category. Data were collected through interview schedule during November 2005 to January 2006 by the researcher herself. The extent of contribution of women in ten items of each of the six selected homestead agricultural activities was measured through a three-point Likert type scale. A comparative contribution in ten selected items under each of the activities was computed using contribution index. Coefficient of correlation 'r' was computed to test relationship between the dependent and independent variables.

The highest percentage of the women contributed in each of the six selected activities such as 47 percent in vegetable cultivation, 43 percent in post-harvest activities, 47 percent in poultry raising, 46 percent in livestock rearing, 35 percent in tree plantation and 27 percent in fish cultivation. Comparative contribution analysis revealed that 'collection and preservation of seed', 'storing rice', 'cleaning the poultry house', 'looking after kids', 'collection of seed' and 'lime application' occupied 1st position among the items of contribution under homestead vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish

cultivation with contribution index of 386, 166, 376, 332, 360 and 352 respectively. Computed 'r' values indicated that age of the women had no significant relationship with their contribution in any of the five selected homestead agricultural activities except post-harvest activities. Physical fitness and family type had negative relationship with contribution in all of the activities. However, education, family size, farm size, mass extension contact, attitude towards homestead agriculture, innovativeness of the women had positive relationship with contribution of all of the activities and the relationships were significant.

Three characteristics namely, education, physical fitness and training exposure of the women had significant contribution to their vegetable cultivation. These variables together explained 41.3 percent of the variation in the homestead vegetable production. While, education, training exposure and family size together explained 34.8 percent of the variation in the homestead post-harvest activities. Same as education, farm size and physical fitness also explained 22.6 percent of the variation in poultry raising. Individual extension contact, family size and farm size explained 22.1 percent of the variation in livestock rearing. Family size and farm size explained 12.6 percent of the variation in tree plantation and lastly education, farm size and training exposure explained 17.2 percent of the variation in fish cultivation. Farmers mentioned a number of problems for performing different homestead agricultural production activities. 'Lack of place in homestead area' was mentioned as the number one problem regarding homestead vegetable cultivation followed by 'un-favourable weather' in case of post-harvest activities. 'Lack of vaccine in time', 'livestock die due to disease', 'lack of suitable land' and 'religious sentiment' were the prime problems faced by the women regarding their poultry raising, livestock rearing, tree plantation and fish cultivation, respectively.

ABBREVIATIONS

ABBREVIATION	FULL MEANING
AAO	Additional Agricultural Officer
AEO	Agricultural Extension Officer
ASA	Association for Social Advancement
BAU	Bangladesh Agricultural University
BBS	Bangladesh Bureau of Statistics
BES	Bangladesh Economic Survey
BRAC	Bangladesh Rural Advancement Committee
BRDB	Bangladesh Rural Development Board
CARE	Co-operative Assistance for Relief Everywhere
CI	Contribution Index
DAE	Department of Agricultural Extension
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GO	Government Organization
IFAD	International Fund for Agricultural Development
JAEO	Junior Agricultural Extension Officer
NAEP	New Agricultural Extension Policy
NGO	Non-Government Organization
SAAO	Sub Assistant Agricultural Officer
SPSS	Statistical Package for Social Sciences
UAO	Upazila Agricultural Officer

CHAPTER I

INTRODUCTION

General background

Agriculture is the single largest sector in Asia that contributes to about 30 percent to GDP and absorbs nearly 60 percent of the work forces (Bhattacharya *et al.* 1995). Although agriculture plays the key role both in GDP contribution and employment, most of the farmers in the developing countries live on or below the subsistence level. They do not have expertise and the same farmer works in more than one area at the same time. Same person simultaneously produces crops, raises poultry and livestock, culture fish, produces vegetables in the homestead garden and fruits in the orchards and does other jobs in his/her tiny household (Swanson, 1984). All his/her works are called agricultural activities. In other words, agriculture in Bangladesh means cultivation of different agronomic and horticultural crops. The contribution of different sectors in agriculture is not the same. Of the agricultural GDP, the crop sector is at the top of the list with 71 percent contributions. Forest and fisheries are equally weighted with 10 percent while rest 9 percent goes to livestock (NAEP, 1996). As the economy of Bangladesh is basically agro-based, social and economic development of the country depends on proper mobilization of its population, especially the rural population as that comprises 85 percent of the inhabitants and directly and indirectly depends on agriculture.

Moreover, for the sake of good health of the nation, (relating to balanced diet) the production of vegetables, fruits, poultry, fishes and livestock should be increased, fodder and fuel production as well as timber should also be increased. It should also be recognized that there is a need for homestead plantation for the natural balance. Further more, with the increasing population along with segregation of families, the cultivable land is being decreased by increasing the

number of homesteads and the area covered by homestead. Presently, 1.1 million acre or 5 percent of 20.8 million cultivable lands are under homestead area in rural areas of Bangladesh.

Homestead is the centre of all agricultural production activities in rural Bangladesh. Homestead is the dwelling place as well as production unit of vegetables, fruits, fuel, timber, livestock and fisheries in an integrated manner. According to Ninaz (1986), homestead refers to home and adjoining land occupied by a family for the purpose like small-scale agricultural production, home-up keeping sanitation, health and nutrition. Homestead as defined by Abdullah (1986) "The land owned and occupied by the dwelling unit of the household and immediate area surrounding the dwelling unit including courtyard, pond, road, space around homesteads, space used for cultivation of trees and vegetables and unutilized space." Homestead agriculture includes backyard gardening, livestock rearing, and poultry raising and fish cultivation.

In Bangladesh, about 84.5 percent of the population lives in rural areas. (BES, 2006) There are about 14.4 million households of which 12.7 million exists in rural areas. The size of homestead area varies with the class of farmers and it ranges on an average from 0.004 to 0.08 hectares. But approximately 28 percent of the household have only homestead but do not have cultivated land, 28.2 percent have land up to 0.20 ha and 40.8 percent are small farmers owning up to one ha (BBS, 2002). Homestead has special significant in the context of Bangladesh where about 62 percent farmers are landless. Homestead agriculture may be a lifeboat for their survival and existence because of secured supply of food, petty cash etc. (Akanda, 1994). In poor countries, household food production is essential in providing high quality carbohydrates and micronutrients that cannot easily be purchased by low-income families.

Women constitute roughly half of world population. In Bangladesh women constitute about 49 percent of the total population (BBS, 2004). In our

subsistent agro-based economy, people of both the sex help each other in their daily life in almost all the productive and socio-economic activities. But their works are divided more or less on gender basis and women are not likely to do this job outside their household, meant for field jobs. Women are involved with homestead agricultural production activities such as vegetables, fruits, timber, small animals (goats, sheep) and poultry birds to supply food and increase family income (Akhter, 1990).

In addition, the rural women do some productive activities including agricultural and non-agricultural works within the homestead (Halim and McCarthy, 1985). Faroque (1980) reported that women productive hour ranged from 10 to 14 a day compared to men's such hour from 9 to 12. Rural women are mostly underutilized and largely unrecognized though they contribute significantly to agricultural and non-agricultural activities (Akanda, 1994). Halim (1987) reported that the women are potential producer of the homestead agricultural products and through their contribution in intensive homestead production they may contribute to the national economy to increase the GDP coming from agriculture.

Moreover, a vast number (approximately 40 percent) of our rural people are landless and about 70 percent of the landowners are small farmers. Landless families possess a small piece of land in the homestead area. Women of these landless families cultivate vegetables, raise poultry, rear livestock and earn money more than medium and large farm sized family (Halim, 1991). This income may meet a part of household expenditure for an average of 5.5 member family size (Anonymous, 1991).

On a worldwide basis, women generate more than half of food that is produced and consumed in developing countries. However, FAO and IFAD (1990) estimated women account for 65 percent of household food production in Asia, 70-80 percent in sub-Saharan Africa and 45 percent in Latin America and the

Caribbean (Saito and Spurting, 1992). Nepalese women are responsible for an estimated 80 percent of agricultural production mostly in family subsistent farming. Shiva (1991) found that the Indian women constitute about 38 percent cultivators. Kown (1988) stated that rice farming is the main activity for 92 percent of housewives in rural Korean. They spend 11 hours and 21 minutes a day during the farming season and 2 hours and 49 minutes during the off-season in agricultural activities. Although the women plays the vital role in the agricultural production process in Asia, no attempt has yet been initiated to quantify their contributions.

Rural women involvement in agriculture started from time immemorial. In Bangladesh, women typically do more work than man (Halim and Hussain, 1983). Traditionally men perform the field based agricultural activities while women are responsible for all activities carried out within the homestead. Further, information savings made by the women contribute to the family income and expenditure especially at the time of crisis to a greater extent also come from homestead farming (Halim, 1991). These findings suggested that the probability and utility of homestead area is a burning reality for feeding increasing population of the country. But due to lack of knowledge and utilization of proper technology and management practices, the production remains below the accepted level. So, it is a crucial need to know the gap between existing belief and performances of the rural women regarding homestead agricultural production activities.

The foregoing discussions clearly depict how well women contribute in the agricultural sector. Some of the studies on gender contribution also show that women are the major in terms of value of production and rendering service hours. These observations has encouraged and prompted the researcher to conduct the study entitled “Contribution of Women in Homestead Agricultural Production in Rajshahi District of Bangladesh”.

Statement of the problems

Growth and prosperity of a nation depends on the status and development of its total works forces. Women in Bangladesh not only constitute nearly half of its population, but also influence overall growth of remaining half. They also contribute highly in all household activities. But their role in agriculture, allied occupations and household activities have always been underestimated and undervalued. Multiple roles played by women in terms of working hours contribution and income generation in the family are neither attended nor recorded even after the constitution of the People's Republic of Bangladesh ensures “Women shall have equal rights with men on all spheres of the state and of public life” (Anonymous, 1988). But it is upsetting to observe that social attitudes towards women are very repressive. Specially in the rural areas women contribute to a large extent in their own productive agricultural sub-system in addition to their routine domestic work. But mostly they are dependent on men for access to various agricultural resources. They work long hours in domestic and agricultural production system as unpaid family labor for family welfare (Begum, 1985). But society perceives these activities as wifely duties rather than economic work. National Women Cooperative Society Ltd. (1979) mentioned in their report that Bangladeshi women like other least developed country's traditionally and culturally have unequal access to social power, education, professions and decision making and suffer from poverty, unemployment and low status in rural areas of Bangladesh. It is well known that women of Bangladesh are very much involved in various homestead agricultural activities such as vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation. But these contributions of women are not recognized in labor force because it is considered as a part of household activities of rural women. Rahman and Rushidan (1985) found that Bangladeshi women perform a great deal of economic activities along with their domestic chores. Mainly they conduct all

post-harvest works like threshing, winnowing, parboiling, soaking as well as livestock and poultry raising, kitchen gardening etc. These should have economic value in the family income. Rahman and Rushidan (1985) also stated that the rate of women contribution in agriculture is somewhere near to the male. But their contributions are not considered in the national labor force.

Not only in Bangladesh but also in China, Indonesia, Malaysia, Sri Lanka, India and in Latin America, rural women work more in agriculture than is normally believed to be but their contribution to the farm sector is largely ignored and inadequately understood (Punjabi, 1988). Hard labor of rural women in agricultural and non-agricultural activities keep the process of regeneration of the energies of the family member. But people do not recognize the contributions of rural women and are used to say that half of the population of the country, the women are not related to the production process. This attitude is also certified by the state machineries. Due to this reason, the population census of 1991 indicated that the contribution of women in labor force in percentile terms is 22 percent though they constitute nearly half of the population (BBS, 2004). This statistics does not give a true picture of the socio-economic area. The main reason for not considering these works productive is that they are not paid for those works in monetary terms. In this regard, Rivera *et al.* (1987) stated that these unpaid female household labors contribute, although not measured, an estimated one third of \$ 4000,000,000,000 to the world's annual economic product (Begum, 2001). Due to lack of recognition of their works women role in agriculture remain beyond the consideration of national planners, agriculture extension specialist, and researchers. This leads in inappropriate agricultural extension policy making for the development of nation.

In rural Bangladesh, homestead is the unique piece of land for dwelling as well as the production unit of agricultural and non-agricultural commodities. Homestead might be treated as the centre of agricultural activities. This is the

place where integrated agriculture is practiced normally by the women. Through appropriate and planned utilization of homestead area, the farm family may meet many necessities and might get economic assistance. Integrated farming is an age long practice in the homestead area but not in a planned manner. It is said that women perform most of the household activities, in their home and homestead area. In addition to their regular non-agricultural activities, rural women are also involved in many agricultural activities. For many landless families the homestead area is the only land resource for production. But due to lack of adequate knowledge and favorable attitude towards the new technology, they are not able to maximize the productivity from homestead resources.

Almost all the above thoughts are more or less theoretical and not fully supported by empirical studies conducted in Bangladesh. There is a dearth of available research studies on rural women for homestead agriculture productions. Hence, the present study is mainly dealt with the rural women contribution in homestead agricultural production for finding the answers of the questions likes:

1. What is the contribution of the women in homestead agriculture?
2. What are the factors associated with their contribution?
3. Do these factors of the women contribute to the variation in their homestead agricultural production?
4. What are the constraints faced by the women in performing different homestead agricultural activities?

In view of the above considerations a study entitled “Contribution of Women in Homestead Agricultural Production in Rajshahi District of Bangladesh” was undertaken.

Rationale of the study

The above discussion has clearly validated the role of women in the agricultural economy although it is not properly recognizes. Urgent policy revisions are, therefore, needed to mobilize women for improved farm production and rural development. Women disfavored institutional actions need to be revised and thereafter coped up paying due respect and honor to women. Agricultural extension encompasses individual or group farmer training to disseminate new or more effective technologies assists farmers in adopting research resulting to local condition conducts applied research for the development of better farming techniques and obtaining feedback on farm problems and practices (Berger *et al.* 1984). But gender biased agricultural extension program in Bangladesh could not meet the actual technological demands of the farming community particularly womenfolk. It is true that women and men have different but almost equally valid experiences, knowledge, skills, perspectives, concerns and interests. Therefore, they can alone represent the total view of the community and active involvement of both women and men can ensure proper development. Proper planning is therefore, necessary to solve the interests of the community. It is also recognizes that the needs of any man and woman may differ according to the different roles that are performed as individual as a member of strata based on occupation and community he (she) belongs to. Extension planners and researchers therefore have to take into consideration about the gender concepts to ensure the balanced growth in the agricultural field. Although a few of the researchers have worked on the issue, their works were restricted in the homestead in affairs only and therefore, the extensive field works has remained almost untouched. Besides, available information are mainly descriptive, based in observations and are not comprehensive (Begum, 1985). So, the crucial role of rural women in the process of agricultural development has drawn little attention to the educationists, extension workers, scientists, agricultural planners and policy makers over time. It is worthy to

mention here that the issues of rural community affairs is getting increasing importance in the government and non-government areas, though very little analysis and critical discussions have been made on the approaches adopted. It is with this end in view, this study identifies the area where the nature and extent of involvement of rural women on various socio-economic strata in homestead agricultural production, especially contribution and constraints face for homestead vegetable cultivation, poultry raising, post-harvest activities, livestock rearing, tree plantation and fish cultivation etc.

Specific objectives of the study

The broad objective of the research is to assess the contributions of women in homestead agricultural production in Rajshahi district. The following objectives are drawn for the study:

1. To determine the contribution of women in different selected activities of homestead agriculture. The activities are:
 - i. vegetable cultivation,
 - ii. post-harvest activities,
 - iii. poultry raising,
 - iv. livestock rearing,
 - v. tree plantation and
 - vi. fish cultivation.
2. To determine some selected characteristics of the women. The selected characteristics are:
 - i. age
 - ii. education
 - iii. physical fitness
 - iv. family type
 - v. family size

- vi. farm size
 - vii. annual income
 - viii. farming experience
 - ix. training exposure
 - x. organizational participation
 - xi. individual extension contact
 - xii. group extension contact
 - xiii. mass extension contact
 - xiv. participation in decision making process regarding homestead agricultural production
 - xv. attitude toward homestead agriculture
 - xvi. innovativeness
3. To explore relationships and determine the contributions of the above mentioned 16 selected characteristics of the women with their contribution in
- vegetable cultivation
 - post-harvest activities
 - poultry raising
 - livestock rearing
 - tree plantation
 - fish cultivation
4. To identify the constraints faced by the women in performing homestead agricultural production.

Limitations of the study

The role of women is changing fast under economic pressure in general and women in particular. Government has also given emphasis to involve women in different way, as they are now a definite strength in the nation building process. Findings of the study will be helpful to planners, administrations and others associated with the development of women. Considering the limitation of time, money and other required resources for the researcher, had to impose certain

boundaries. Moreover, a social science research is associated with a number of limitations, because the findings are based on the ability of the respondents to recall as well as the sincerity and honesty in providing information. Hence, the study had the following limitations:

1. All the female members of the farm family including female children had a contribution to homestead agricultural production. Considering the time and resources only principal farmwomen of the farm family were considered in this study.
2. Many social, personal, economic and physiological factors also have influenced the respondents to participate and spend time in homestead agricultural production activities at home. But considering the researcher's own observations and time constraints only sixteen characteristics of the respondents were taken into consideration.
3. There were many agricultural activities performed by rural women in homestead. Such as :

- vegetable cultivation
- post-harvest activities
- poultry raising
- live-stock rearing
- tree plantation
- fish cultivation – are important.

These activities were considered for this part of research.

4. The study areas were confined in four randomly selected villages of the Rajshahi District namely Narikelbaria, Khorkhori, Talanda and Haridebpur. Hence, the findings of this study will be applicable to the study area, only Rajshahi district. Areas with different socio-geographical conditions are not represented in this study. However, Bangladesh has almost the same cultural, socio-economic and geographical condition and these findings might be applicable to other parts of the country too.

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Assumptions of the study

An assumption is the supposition that an apparent fact or principle is true based on available evidence (Good, 1945). The researcher conducted this study viewing in mind the following assumptions.

1. The sampled respondents were capable enough to satisfy the queries of the researcher.
2. The selected respondents in the sample were capable of furnishing proper responses to the queries that were included in the interview schedule.
3. Views and opinions furnished by the respondents were representative views and opinions of the population of the study area.
4. The responses furnished by the respondents were reliable.
5. The researcher acted as interviewer and she was well adjusted to the social environment of the study area. Hence, the data collected by the researcher were free from bias.
6. The data were normally and independently distributed.
7. The items, questions, and scales used for measuring the variables were reasonable adequate to reflect the respondents real answer.
8. The sampling procedure, the analysis of data, and interpretations etc. were free from all biases.
9. The findings of the study would useful for planning and implementation of the program of extension services. The findings of the study would particularly be applicable to the study area.

Definition of terms

For clarity of understanding, certain terms used frequently throughout the study are defined and interpreted as follows.

Rural women

Rural women are those women who live in the rural family in the villages and are directly and indirectly engaged in farm activities.

Contribution

It was considered to be an active process, meaning that the person or group in question took initiatives toward achieving something. Contribution here meant to be involved in different affairs of homestead agricultural activities by women.

Homestead

The homestead area for this study was defined as the raised land in which the household had its entire swelling including living rooms, kitchen, cattle shed, sheep shed, front yard, courtyard and the area under vegetables, fruits trees, timber trees, backyard bushes, bamboo bunches etc.

Homestead agriculture

It referred to production of agricultural commodities viz. crops, livestock, fisheries, forestry etc. including post harvest activities which are usually performed in the homestead area.

Agricultural activities

These are referred to as the works done by women members of the households for helping in agricultural production directly or indirectly. Agricultural activities included post-harvest activities such as threshing, winnowing, drying and preserving grains. Vegetables and fruit production within the homestead

area, cattle, goat and poultry rearing, fish cultivation, tree plantation and such other activities related to production.

Age of women

It is defined as the chronological duration of time from her birth to the time of interview.

Education

Education refers to the development of desirable knowledge skill and attitude in the individual through reading, writing and other related activities. It is measured in terms of years of schooling of individual respondent.

Farm

It refers to a household or unit of holding organized for production of one or more enterprises like crops, livestock, fish, trees etc. for the purpose of satisfying the farmer's goal. A farm may or may not be of commercial venture.

Farm size

It refers to the area of land owned by a farmer or his wife on which farming activities are carried out. A respondent was considered to have full benefit from cultivated area either owned by himself/herself or obtained on barga system, the area being estimated in terms of full benefit to the farmer. The right of a farmer on the land taken on lease or mortgage from others was regarded as ownership in estimating the farm size.

Family size

Family size of household was defined as the number of individual's in the family including herself, her husband, children and other dependent members who live and eat together.

Non-agricultural activities

Non-agricultural household activities were the activities of rural women not related to agricultural production. These include taking care of children, cooking and feeding all members of the household, taking care of the house, maintaining utensils, furniture and taking care of all the members of the household when any one of them got sick.

Post-harvest activities

It referred to operations done after harvest of a crop. The operations included threshing, winnowing, drying, grading and preserving of agricultural produces these operations usually are performed in the homestead.

Communication exposure

It refers to the frequency of exposure of a rural woman to different individual sources, group sources and mass media of information.

Extension media contact

It refers to an individual's access to or contact to the communication media and source being used for dispersion of new technologies among rural women.

Organizational participation

Organizational participation of a rural woman refers to her participation in different social organization either as an ordinary member, executive committee member or executive officer within a specific period of time.

Annual income

It refers to the total income earned by the respondent and other members of her family from agricultural and non-agricultural sources including business, service etc.

Attitude towards homestead agriculture

An attitude is a personal disposition common to individuals but possessed in different degrees, which impels them to react to object/ situation in positive or negative ways. In this study, attitude was defined as women personal positive or negative reactions towards different aspects of homestead agricultural production.

Constraints

It refers to the factors / situation / circumstances / influences that act as hindrance or barrier in women contribution in homestead agricultural production.

Innovativeness

It refers to the degree to which an individual is relatively earlier in adopting new ideas than other members of the social systems (Rogers, 1995).

CHAPTER II

REVIEW OF LITERATURE

The researcher made a through search of available literatures as far as possible but no specific research on contribution of women in homestead agricultural production was found. However, some closely related researches from home and abroad have been reviewed in this chapter.

Women role in development activities

Women and men are both major contribute to the social and economic survival and well being of societies, although women and men may have different but interdependent and overlapping roles, responsibilities and activities. These roles and responsibilities are determined by society and influenced by social, cultural, economical, political and environmental factors and may change over time (Ahsan, 1995). The roles of women in the society can be defined :

- The reproductive role, which refers to the women role as child bearers and child careers. It is conventional to include in this definition the women role as household managers and water and fuel gatherers.
- The productive role refers to women role in producing food, especially subsistence vegetables, post-harvest activities of crops, poultry raising, livestock rearing, participating in sericulture, aquaculture and their contribution to handicrafts and other income generating activities.
- The community role relates to women role within the community as the members of women groups, association and women club/organizations are maintaining family obligations and rights (Boserup, 1970).

Women and men have different but equally valid life experiences, knowledge, skills, perspectives, concerns and interests, so that neither they can alone

necessarily represent the total community view. Hence, nearly half of the human resources are the integral part of the world community development. Progress in exploring women contributions to their societies had started since 1975 when the UN international decade for women drew attention to their specific needs. At the UN world conference on "Agrarian Reform and Rural Development" for instance, problems faced for better statistical data about their role in rural activities (Gabriel, 1990).

A brief history on women role in development

The world conferences of UN General Assembly held in December 1980 in Mexico city and in Copenhagen had taken the decision for requesting the Secretary General to prepare an interdisciplinary and multi-sectoral world survey on the role of women in overall development. International Development Strategy conference on "Third United Nations Development Decayed" focused particularly on trade, agricultural industry, energy, money and finance and science and technology. The conference recommendation was a decisive step forward in the way in which the women aspect in development has been perceived.

According to the General Assembly's instructions the survey was to cover:

- ❑ the present role of women as active agents of development in each sector.
- ❑ an assessment of the benefits according to women as a result of their participation in development namely - income, conditions of work and decision making.
- ❑ ways and means of improving women role as agent and beneficiaries of development at the national, regional and international levels.
- ❑ the potential impact of such improvements on the achievement of overall development goals.

However, this survey was not easy to produce. The main shortcoming of all global economic statistics from women point of view is without doubt the

invisibility of the unpaid labor in households and the informal and agricultural sectors, a major part of which, in all countries is performed by women.

This problem was taken upright at the beginning of the survey, because the exclusion of unpaid labor from all the statistics distorts the assessment of women contribution to economic development and well-being of their countries. But world survey discussed quite substantively the importance of unpaid labor in various sectors of life. Most significant and usually totally blurred, is domestic work which, in reality has an immeasurable economic importance. In addition the so-called informal sector, in agriculture and trade, comprises a significant amount of unregistered labor. In all these fields women contribution is significant but grossly underestimated. The informal labor market also covers huge variety of occupation and skills. Most of these contributions by women in developing countries are not included in any statistics (Pietila and Vickers, 1990).

Agriculture

In the field of agriculture the ordinary statistics on women work have been misleading, giving mostly a distorted picture of the situation. It goes through many comparisons between official, national statistics and in-depth community level studies. These would be more clear if we make an examples in 1980 women and girls together contributed more than 53 percent of the household income in rural house holds of Nepal. But several studies in subsequent years have recommended that in Nepalese agriculture women labour contribution is substantial and at least equal to that of men (Acharya, 1995). The cardinal error of national statistics seems to be due-according to researchers deep-rooted patriarchal values that make men and women reluctant to report women actual participation.

However, this miserable situations have much improved in the recent decade. During the declaration of the United Nations Decade for women, Government of different countries have taken various activities. Bangladesh Government took up the cause of women in development (WID) with great public zeal. The explicit consideration was given in the First Five Year plan for integrating women into the development process. In the second Five Year plan (1980-85) a full fledged Ministry of Women affairs was set up and 10 percent quota in all cadre services and 15% of staff in semi-autonomous and autonomous organizations were to be reserved for women. Resources were channeled to rural women through various development initiatives (Kabeer, 1991).

Economic activities of women in Bangladesh

A nation can not go forward keeping away half of her human resources, the women, from development activities. We may divide these women forces into two categories namely (i) active and (ii) inactive. We can consider the female children up to 12 years and elderly women above 65 years as inactive. The rest we may consider as active. This assumption should not be inferred that womenfolk belonging to the inactive group have no contribution in our national economy. But we could say this contribution is marginal. Active womenfolk are participating effectively in a labor force and contributing to our economic development. A considerable number of educated women have been working into various occupations. The semiliterate and illiterate women also have been participating in developmental activities, like garment, silk, textile industries, sericulture and in various NGO's. Even they have been working in a very hard job such as road and building constructions like a man.

Punjabi *et al.* (1988) mentioned Bangladeshi women not only work in the fields but poverty forces them to participate also in other types of hard manual labor such as road and building construction.

However, in an agrarian and poverty stricken economy and also due to various economic nature and socio-cultural pattern the women participation is invisible and their contribution is unrecognized. Their critical issues and needs are overlooked. The general attitude of the societies is imbued with the idea that men as a rule perform all the productive work and womenfolk are completely dependent on men (Khan, 1988). These are lives also supported by the traditional sense of economic activities, which refer to productive activities engaged in for payment of wages or remuneration. In rural area this would include activities that are directly related to the ploughing of soil or agricultural field work. But in subsistence agriculture, women labor is mainly self-employed and women generally perform household agricultural activities as an unpaid family labor. These activities are processing of food grains, preservation and storage of seeds, preparing family food, rearing poultry and livestock and growing vegetables. Though these are the integral part of the agricultural production process but under the existing definition these activities are excluded from being economic (Huq. 1979). All these activities of women are not unproductive. Women, who worked hard all day long to provide food, care and services necessary for maintaining the health and welfare of family members as labor are considered uneconomic. It is not considered, even the women who would participate in home gardening. In this regard Kabeer (1991) quoted that it is necessary to consider the validity of the western concept regarding women employment. It is very unfair to think that those who work in the home are unemployed. To women rearing and educating a child is a full time job. So, how it can be said that staying at home is a loss of productive manpower. Development is likely to increase, other factors remaining the same, if a healthy and psychologically satisfied generation can grow up in the care of mother.

The traditional definition of economic activities is limited and gives rise to the error and confusion which contributions to the nation that rural women are

nonproductive. Moreover, these definitional limitations also ignore rural women contribution to the growth and development of the nation. To avert such definitional limitation economist have used time budget studies, where they showed the allocation of time on work, non-work and leisure both by men and women in a subsistence farming. Raj (1976) stated economic work as “work contributing to income generation or gain of some kind”. The time spent in productive work is that which involves efforts that produce some utilities.

Farouk *et al.* (1973) conducted a study where he found that rural women spend about 12-14 hours daily in productive work. The works are: (i) income generating activities and (ii) expenditure saving activities at home and also (iii) the manifold household chores. A number of such studies were conducted by various researchers such as Halim and McCarthy (1983); Hossain and Shahnaz (1985); Gupta (1983) and Abdullah (1985). All of them measured the time spend of farmwomen in agricultural and non agricultural activities as unpaid family worker. Thus rural women were taken under consideration by the policymaker, planner, sociologist, extension specialist into the development forum all over the world, specially the third world countries. In this regard the researchers have conducted a lot of researches, and have shown that farmwomen contribute significantly in agricultural development. Following are some of the research findings reviewed for this study.

Women and agriculture are closely related form the beginning of human civilization. From the history, cultural and anthropological literature it was found that the women first invented cultivation of crop plants and domestication of animals and thereby initiated the arts and science of farming (Achanta, 1983; Swaminathan, 1985).

Baqui and Ahmed (1994) conducted a study at Gazipur Sadar thana where they found 100 percent manual threshing and winnowing, 95 percent sun drying, 100 percent traditional parboiling, 50 percent steaming parboiling, 100 percent

'dhaki' milling, 40 percent machine milling and 100 percent separating of husk, bran and broken rice are done by women.

Ali (1980) cited that women played an extremely vital role in agricultural sector in which 70% women labor force were engaged. They performed threshing, drying, cleaning, winnowing, storing, parboiling, husking and preserving of paddy at home. Besides these, they produce vegetables, fruits trees, reared poultry and livestock, and culture fish. Moreover, during off season they produce different handicrafts, like ropes, mat, "Katha", hanger etc.

Axinn (1990) stated that women used to be chief cultivators of beans and cowpeas in the USA, Africa and Latin America but in South Asia they are not only active labourers but also make decisions in agriculture.

Gabriel (1990) referred FAO of the UN which has calculated that in Sub-Saharan Africa women represent nearly half of the agricultural labor forces (47%) but only 2.9% agricultural advisers are female.

Rana *et al.* (1989) stated that rural women are extensively involved in the farming systems of all developing countries, including Pakistan. A systematic inquiry is conducted to explain their visible and invisible activities along with the problems facing by them. Women work on contract or for daily wages in agro-based industries. They need training on food grain storage, livestock rearing, rodent controlling, conservation and food processing, poultry raising, bee-keeping and operating biogas plants.

Dak *et al.* (1989) conducted a study in four districts of Harayana, India investigated the contribution of women in farm production activities and effects of social and institutional framework and they showed that women participated widely in agricultural activities in core as well as in preparatory and supportive activities. They also played monopolizing or dominating roles in decision-making Social and institutional factors, particularly casts, landholding status,

family education and mechanization have exerted a more adverse influence on female labour participation than on their decision-making role. Farm mechanization and the level of adoption of improved farm practices have positive affect on women labor participation in agriculture.

Ahsan (1986) conducted a study of women role in agriculture in two village of Comilla where he found that 75% female of the villages were involved in both homestead and field agriculture. The proportion of women involvement in agriculture depends on the farm size of the family. It was found that about 30% time spent by women are in agricultural activities; where small farm women were found to spend more time in field agriculture but large farm household women spend more time in homestead agriculture. He also stated that women contributions to agriculture as well as other economic production are yet to be recognized and these are regarded as part of the household activities. He also made a suggestion that women contribution should be recorded to the economy and recognized in various development activities.

Khan (1985) conducted a study on women economic role: insights from a village in Bangladesh. He tried to find out the traditional and non-traditional work of the women and the way in which the work is perceived. He found that at the grass root level although economic condition is forcing women to play a changing role in household resource generation, very little shift is taking place at the levels of values and ideology. The conceptualization of the traditional roles of women remains strong.

Ali *et al.* (1980) cited that Bangladeshi women face social and religious constraints in participating agricultural and other activities. In spite of these obstacles women of Bangladesh are engaged in highly productive activities and are contributing mostly as unrecognized labor to the socio-economic development of the country.

Hossain and Shahnaz (1985) stated that farm size is a factor significantly conditioning the time and activities of women. Landless households spend 79 percent of the total day in agriculture in a predominantly agricultural village, much of which is being spent in rice culture, and this amounts to 52%, 46% and 53% for small, medium and large households, respectively.

Sethi (1984) conducted a study on changing patterns of female labor in agriculture: the case of Punjab, where he found that mechanization need not push women out of agricultural labor, if certain social and structural factors are present.

Kalaminathi (1988) stated that condition of women in the agricultural sector has remained the same over a long period. In the past they were either labourers or assisted their husbands in some agricultural operations. But now women are consulted regularly on many aspects of agricultural marketing. A significant percentage of lower castes and lower classes women participate in agricultural labour force.

Mazumder *et al.* (1983) found that the rural women folk have contributed a huge amount of labor force to the agricultural sector and they significantly participate in agricultural activities with many other non-agricultural productive activities.

Task Forces Report of Bangladesh Development Studies (1991) showed that about 43 percent of women are involved in agricultural activities directly or indirectly. The remunerative farm activities done by women include the processing of field crops, poultry keeping, feeding and care of livestock and homestead gardening. They also mentioned that due to the definitional anomalies of labor force participation of 85 percent of our active female population are shown as inactive.

Alam (1995) in his welcome address of a National workshop on case studies about success stories of women in agriculture stated that participation of Bangladeshi women in agricultural activities, particularly in post-harvest, home gardening, poultry raising etc. has been continuing for centuries. It is however only recently that we have recognized with due importance of the women share and their significant contribution in the national economy.

Shirin (1995) conducted a research in Jessore and Rangpur and found that women are very much involved in post-harvest work along with the day household activities but they usually do not participate in the field. It was also found that traditional social norms and values are changing. Due to extreme poverty and crisis female member are very useful and productive. They participated in mixed farming, agro-forestry and vegetable production in addition to rice farming and homestead gardening.

Zaman *et al.* (1995) made a small study in the three thanas of Mymensingh district where they found that 70-90% women use traditional farming practices and raise poultry for family consumption. Many families rarely buy eggs, rear chicken or ducks from the market. Their husbands largely help in marketing of eggs and birds.

Akhter (1990) reported that women contribute to family income through homestead farming activities such as fruit and vegetable gardening, poultry rearing, goat raising etc. This income is used as part of their household expenditure.

Hoon (1991) stated that in the rice farming system traditionally more female labor were used. They contribute most of the labor in transplanting, weeding and harvesting. Their contribution is more than 50% in India, Nepal, Indonesia and roughly 33% in South East Asian countries.

Martius and Von Harder (1985) in a survey found that women in the rural households perform a number of economic activities viz. post-harvest activities, tree plantation, poultry raising, vegetable gardening, fuel gathering etc. But these contributions of the women are not recognized remarkably. It is observed that when any initiative is taken to treat women as recognized and remunerative labour force the traditional purdah (veil) norm acts as a barrier.

Virdi (1993) mentioned that women in Bangladesh have almost always been associated with agriculture. They are involved in food gathering, food preparation, post-harvest activities, homestead gardening and more recently field agriculture. However to recognize these activities as components has resulted in unsustainable extension networks service to the need of rural women in agriculture.

Sudharani and Raju (1991) cited that household based subsidiary professional programme such as cattle production, poultry rearing, agriculture, sericulture mushroom culture and fruit preservation might generate extra employment opportunities for the farmwomen and gradually they will proceed to these operations.

Halim (1991) in a study found that rural farm women in Bangladesh were active in productive works in household industry and even in marketing in addition to take care of children, preparing and serving food to other members of the family. They are also actively involved in agricultural and non-agricultural activities.

Dey (1985) showed that women in the household were economically active and played important role in post harvest activities as well as other economic activities like home-gardening, livestock rearing etc. His study revealed that there was a diminishing effect on the importance of women role in agriculture due to mechanization.

Khan (1995) stated women in Manikgonj district of Bangladesh were responsible for most post-harvest activities, livestock care and kitchen gardening. They also suggested that the working period of women making economic contribution to the household varies between 12 and 16 hours a day.

Carmen *et al.* (1991) reported that nature and extent of women contribution to field crop with particular focus on their post-harvest involvement. They also claimed that the women participation in farming is probably greater in homestead production.

Brammer (1983) pointed out that women do a large extent of agricultural activities such as post-harvest operations, poultry raising, vegetables and fruit trees culture, livestock etc. He further highlighted that low literacy rate, shortage of women officials, introduction of inappropriate technology and insufficient programme policies hinder women's participation in agricultural activities.

Abdullah and Zeidenstein (1976) reported that women in rural Bangladesh work on an average 10 to 14 hours a day on seed and grain storage and preservation, post-harvest rice processing, vegetable and fruit growing, poultry raising, livestock care, food processing, preservation of household items and fuel gathering. Women contribute to the financial support of the family for their own future security provided that women are economically motivated and active.

Quddus *et al.* (1985) reported that the kitchen gardening and home level food processing was satisfactory and profitable and women participation was very high with strengthening extension work and their participation was highly favourable. They also advocated that with the existing social system homestead gardening may be considered a major area for women which have both economic and nutritional implications for the well-being of rural women particularly for the poor unemployed women.

Imam *et al.* (1991) estimated that a house wife of small and medium farm can earn Tk. 12000 to Tk. 15000 in one season by spending Tk. 2000 in vegetables gardening.

Halim *et al.* (1985) cited several examples of pre-harvest and post-harvest activities of different crops and primarily of rice as were done by the women in Bangladesh. As a whole women productive hours of work, irrespective of weather, vary between 10 and 14 hours which is considerable more than the productive work hours of men, which vary between 9 and 11 hours.

Begum (1985) crudely categorized the responsibilities of farmwomen into maintenance of households, family growth and kitchen gardening and farmyard based activities including crop processing and livestock care. Agricultural fieldwork and external transactions are the responsibilities of men.

Sayeed (1992) stated that women in Bangladesh are typically involved in post-harvest processing of food and non-food products intended for domestic consumption or sale. Their contribution is substantial even they are mostly confined to the homestead. In the Philippines women have significant participation in post-harvest activities, i.e., 36.5% in harvesting, 42.4% in drying and 45.1% in storage out of the total labor force. Whereas in Sri Lanka, more than 50% of the total agricultural work force involved in harvesting and post-harvest operation (cleaning, drying, storage etc.) are done by rural women. Hundred percent parboiling is done by women and their participation in post-harvest care of maize and pulse grains are also very high. On the other hand, in India post-harvest operation are almost exclusively dominated by women; their involvement ranging from 70-90 percent. FAO (1990) mentioned that the extent of women participation in agriculture and the specific activities they performed vary greatly according to country, region, class ethnic group, the structure of the household, the productive resources available and prevalent technologies.

Jahan (1990) in her study found that in some NGO and government programmes, women from landless households cultivate fish individually or jointly in leased ponds, either within or near the homestead.

Thi (1995) stated in rural Vietnam 80 percent of the female workforce is employed in agriculture, while 72.8 percent of national female workforce is concentrated on agricultural, forestry and fisheries. Agriculture is the most important economic sector in terms of value of agricultural output in GDP, mouth-to-feed and employment. Of the total labor force in the rural sector, 70 percent are in the 15-30 years age group and 53 percent of which are women.

Stephens (1995) stated that women in rural Nepal contributes substantially in their economy. In early 1980s it was found that women and girls together contributed more than 53 percent of household income in rural household in Nepal.

Roy (1990) noticed that women play a pivotal role in agriculture as they attend in many cares to various field operations, starting form harvesting, transplanting to post-harvesting activities.

Res (1985) cited that in rice farming women contribute on the average 11 percent of the total family labor. Specially in low income and in older households women participate in rice production. In all households, women part is particularly important in financial management and in disposal of the outputs of rice production.

Saradmoni (1991) stated that women of India are indispensable to several aspects on ice cultivation. Yet this is relatively undocumented. She also opined that female labours contribute a significant share of the effort into paddy cultivation. Their economic contribution to the household is considered substantial, particularly in the case of low-income groups. Within the home women are found to be extremely supportive in terms of finance and food

supply. Moreover, one must be cautious about generalizing the results for the country as a whole; this study has important implications for the role of women in a society like India.

Akter *et al.* (1996) reported that many of the post-harvest activities in the rural area are done by women of Bangladesh. These activities are mainly threshing, cleaning, drying, parboiling, winnowing, milling and grading of cereal crops.

Kada and Kada (1985) found that in Japan rural women contribute substantially in most task of rice cultivation which is about 40 percent of total labour input. Traditionally in rice cultivation namely, transplanting, weeding and harvesting were considered to be women task.

Khan (1985) described that village women are involved in domestic work such as cooking, fetching water, gathering fuel, cleaning house and rearing child, attending kitchen and working in agricultural particularly post-harvest activities such as parboiling of paddy, drying, hushing, winnowing and storing for home consumption.

Halim and McCarthy (1983) found that there are about ten different types of work are done by the rural women in Bangladesh. These activities are paddy husking (100%), house cleaning (92%), parboiling and drying (166.66%), spice processing (54.66%), water carrying (46%), washing of clothes and utensils (41.33%), winnowing paddy (29.33%), sewing (8.66%) cooking (1.33%) and feeding the cattle (1.33%).

Hansra and Dillon (1995) mentioned that the farm women of India performed successfully a number of agricultural activities such as preparation of compost and farmyard manure, land preparations, seed selection, seed treatment and sowing, transplanting, fertilizer application and using pesticides etc.

Khan (1995) found in her study that in most cases women participated in decision making process on their loan utilization and control over their wage and income. They also used their income for family welfare.

Goleson (1988) mentioned that in Taiwan women are often farmers and work almost in all aspects of agricultural works with their male counterparts. An abundance of female labor was generally associated with intensive cropping, such as vegetables production and fruit cultivation while men were responsible for other activities like machines operation. They also cited that farm families with more female labor were more likely to grow mainly rice and sugarcane.

Akter *et al.* (1993) cited that women working hours varies according to the farmer categories, ranging form landless to marginal to large farmers. Specially, in case of post-harvest processing, women spend more time as farm size becomes larger. However, in some activities such as off-farm activities, landless women spent hours than the other group.

The Relationship with the Selected Characteristics of the Women to their Contribution in Agriculture

Age and women contribution to agriculture

Miah *et al.* (1994) found in their study that there was a significant relationship between age of the rural women and their time spent in farming activities.

Akanda (1994) showed that the age of the rural women had significant positive correlations with their participation in the cultivation of household vegetables and fruit trees.

On the other hand, Islam (1994) found that the women age was not significantly related to their extent of participation in income generating activities.

Sirohi (1985) cited that different agricultural activities were performed by various age groups. He found that threshing belonged to the age group of less than 15 and storing, harvesting, sowing belonged to the age groups of 25-40 years.

Parveen (1993) found that the farm women age had a positive significant relationship with their attitude towards homestead agricultural production in case of modern village and insignificant in case of traditional village.

Nag *et al.* (1980) found that average time spent by female farmer in agricultural activities was positively related to their age.

Kaur and Singh (1991) cited that in India there was no relationship between age and extent of smokeless chulla utilization of farmwomen.

Singh (1991) conducted a study in Ferozpur and Faridkot districts of Punjab, India on the extent of adoption of selected recommended practices by known growers. He got insignificant relationship between age of the farmers and their level of adoption of plant protection measures.

Seema (1985) found that different activities performed by rural women varied with their age. Sowing, harvesting and storage operation were preferred by women with the age group 25-40 years whereas irrigation and plant protection measures were confined to the women in the age group of below 25.

Naher (2000) observed that age of the women had no significant relationship with their participation in homestead agriculture

Begum (2001) found in her study on women's contribution in post-harvest activities that age had no relationship with contribution.

Alam (2004) observed that age of a rural women had influence to their attitudes towards homestead vegetable cultivation.

Haque (2002) found that age of the rural women was not correlated with their attitude toward homestead agriculture.

Miah and Halim (1994) conducted a study on the flow of agricultural information where they found age of farmers had significant influence upon the identification of information needed in operating various farming activities.

Islam (1994) found that age of the women was not significantly related to their extent of participation in agricultural income generating activities.

Miah *et al.* (1994) obtained that the relationship between age of the rural women and their time spent in farming activities were insignificant.

Miah and Halim (1994) obtained a significant positive relationship between the age of the rural women and their participation in the decision making process.

Education and women contribution to agriculture

Akanda (1994) found that education of farmwomen had significant positive relationships with the cultivation of homestead fruit trees.

Islam (1994) observed that the education level of rural women was directly related with their extent of participation in agricultural income generating activities.

Arya (1979) conducted a study on women role in decision making in farm credit where she reported that family education had no significant relationship with women participation in decision making.

Kaur (1988) evaluated the women development program where she found that education has influenced the women opinion about the project activities and adoption of home-gardening and animal husbandry practices.

Naher (2000) found that education of the rural women had significant relationship with their participation in homestead poultry raising and goat rearing but no significant relation with homestead vegetable cultivation and post-harvest activities.

Begum (2001) observed that academic qualification of the farm women had no significant relation with their contribution in post-harvest activities.

Haque (2002) found that academic qualification of the rural women had a significant relationship with their attitude toward homestead agriculture.

Alam (2004) described that academic qualification of the rural women had a significant positive relationship with their attitude toward homestead vegetable cultivation.

Kumari (1988) indicated that there was a significant relationship between education of women and attitude towards the message and knowledge level.

Rahman *et al.* (1988) reported that no significant success in case of women education and training is discernable within 1974 and 1981. During this period woman literacy rates of Bangladesh improved only 13 percent to 18 percent and the rate of growth for female literacy was insignificant.

Khan (1983) found that the rural women educational level has a positive relationship with their participation in community development activities and income generating projects of Bangladesh.

Masood (1988) indicated that educational level of farmwomen is positively related with their extent of participation in farm operations.

Physical fitness of farm women and their contribution

Park (1988) showed that the health is one of the four fundamental human needs along with food, clothing and shelter. It is a basic element of the happiness

which people seek. So, the women health has a great influence upon her family and society. However, she found that there was no apparent relationship between the attitudes toward farming and the physical good or bad symptoms of the respondents.

Begum (2001) observed that physical fitness of a farm woman had no significant relationship with their contribution in post-harvest activities of boro rice and pulse crops.

Family size of the rural women and their contribution to agriculture

Halim and McCarthy (1983) showed that the various types of economic activities such as post-harvest activities, livestock care and homestead vegetable gardening etc. were performed by rural farmwomen but their rate of participation largely depend on family structure.

Rao (1976) found that rural women participation in agriculture was negatively correlated with their family size.

Shadeque (1995) observed a significant relationship between family size and adoption of improved technique of watermelon production such as using poly bag method and culture of rice-fish.

Ullah (1995) showed that family size had positively significant relationship with adoption of livestock and green revolution technique.

Devi (1983) showed that family size had significantly positive association with the farm and house management role of farmwomen.

Haque (2002) found that family size of rural women had significant relationship with their attitude towards homestead agriculture.

Alam (2004) found that family size of rural women had significant relationship with their attitude towards homestead vegetable cultivation.

Farm size and their contribution to agriculture

Sangwan *et al.* (1990) made a study on women participation in agricultural farm activities. They obtained a reciprocal relationship between the women involvement in farm activities and their farm size.

Halim (1991) evaluated Farming System Research (FSR) activities of homestead component where he found that women of small farm family spent more time in agricultural activities than the women of medium and large farm family in Kazirshimla site of Bangladesh. But in Noagaon site he found that women of medium farm family spent more time in agricultural activities.

Kaur and Singh (1991) found no relationship between farm size and adoption of smokeless chulla.

In Philippines, educational level of women had highly significant relationship to their participation in rice farming system (Shah, 1989). Similarly the labour utilization of the respondents had significant positive correlations with their participation in homestead vegetable and fruit cultivation as observed by Akanda (1994).

Safilios *et al.* (1989) reported that the highest involvement of women in field agriculture in very small households (0.02-0.364 ha.) followed by women of landless, small and medium size farm household. They also found homestead production was in the hand of women. It was revealed that major tasks and decision regarding homestead crops were the responsibility of the women in all farm size categories except the large farm households.

Bhatnagar and Saxena (1987) conducted a study on time utilization of tribal and non-tribal women in home and farm activities in Bangladesh. They found that there was a significant effect of the size of land holdings and time utilization in

agricultural activities. They found, time spent in agricultural activities had increased with the increase of farm size of the farmer.

Ahsan (1986) reported that the time allocation of women depend on the farm size of the family. It was found that about 30 percent of the time was spent in agricultural activities. Women from small farm size were found to spend more time in field agriculture while women from larger farm households spend more time in homestead agriculture.

Naher (2000) found that farm size of rural women had significant relationship with their participation in homestead agriculture.

Begum (2001) observed that farm size of farm women had no significant relationship with their contribution in post-harvest activities of pulses and oil seed crops.

Alam (2004) found that farm size of rural women had significant relationship with their attitude towards homestead vegetable cultivation.

Annual income of the family and their contribution on agriculture

Akanda (1994) found in his research that family's annual income had significant correlation with the participation in the fruit trees cultivation.

Alam (2004) found that annual income of rural women of rural women had no significant relationship with their attitude towards homestead vegetable cultivation.

Miah and Halim (1994) observed that the family's annual income had a significant influence upon the identification of information needed by farmers in operating various farming operations.

The World Bank (1988) reported that the women are mainly responsible for homestead crop production. They contributed 0.3-2.5 percent of annual cash

income per household from homestead vegetable production and contributed 1 to 11 percent from tree product (fuel, fodder and fruit).

Sirohi (1985) found that the rural women of India having family income of Rs. 250-500 mostly participated in threshing and plant protection measures and women of low income group preferred sowing, irrigation, harvesting and storing in order of their preference.

Manjunstha (1995) found farmer with less annual family income mostly found in low awareness category. This has been substantiated by the significant results of chi-square test. Naturally more annual family income helps farmers to exposed activities outside of their community.

Bharathi *et al.* (1995) found that the attitude of the respondents were significantly influenced by knowledge and education levels of the respondents.

Halim (1991) evaluated Farming System Research activities of women in Noagaon where he found women of large farm family contribute maximum to poultry raising but small farm family women save more from vegetable cultivation (Tk. 228.89/year).

Khan (1993) cited that there was a significant relationship between annual income of the farmers and their adoption of insecticides. Hossain and Grouch (1992) found similar results in case of improved farm practices in Bangladesh.

Khandaker and Chowdhury (1995) showed that family annual income of the rural women had positively significant influence on their improvements of household material and welfare. The relationship was statistically significant.

Halim *et al.* (1997) found that among the farm categories, women had the highest contribution to all activities in small farms, while in large farms women were better contributors in off-farm activities and in medium farms contributed more both in domestic and off-farm activities. In respect of total labour charge

in household activities per year women contributed an average of Tk. 19276 compared to men, who contributed Tk. 6392 irrespective of the farm size.

Farming experience of the rural women and their contribution to agriculture

Miah and Halim (1994) found farming experiences had a significant influence on the identification of information needed by farmers in performing various farming operations. They also obtained farming experiences had positive and significant relationship with all the independent variables.

Begum (2001) found in her study that farming experience of the farmwomen had not significant correlation with their contribution in post-harvest activities.

Training exposure of farmwomen and their contribution in homestead agricultural production

It is believed that the training exposure can increase the knowledge, skill, and attitude of a participant. There are several examples in these regard, since 1994, farmwomen have been included in a farmers field school (FFS) for training on integrated pest management (IPM) in Tamil Nadu. The FFS runs thirteen weeks for thirty farmers (including four farmwomen). Female agricultural officers taught them to identify the pest and predator insects in rice, to monitor the number of each to ensure that the predators are keeping the pests in check. They also learned to observe the life cycles of the key insects/pests and their functions in population throughout the cropping season. They also taught the principles and practices of organic farming, integrated nutrient management and the use of bio-fertilizers, cultural, mechanical and biological pest controls. The participants were also trained in the use of bio-pesticides and chemicals as a last resort if predator populations are insufficient of keep the pest members within economic limits. Farmwomen expressed their confidence not to lose the corps as they have knowledge, courage and enthusiasm. Before training women farmers regularly used pesticides in their homestead as well as field crops. But

after received training, they had stopped spraying their homestead vegetables as well and begun to monitor pests predators in their home gardens which saved money, protect the family's health and also improved yields (Jiggins *et al.* 1995).

Samanta *et al.* (1993) stated organized training is important to make the farmwomen consensus about their role, and contributions in the farm production system.

Parveen (1995) found insignificant relationship between the training exposure of the farmwomen and their awareness on environmental degradation and knowledge on the use of chemical fertilizers, pesticides and irrigation.

Organizational participation of rural women and their contribution

Miah and Halim (1994) showed that organizational participation of farmers had significant influence on identification of information needed for various farming activities.

Miah and Rahman (1995) revealed insignificant relationship between organizational participation of the farmers and the awareness on farming environment.

Ebolh (1994) conducted a study on farmwomen access to agro-information and technology in Nigeria and found a significant relationship between involvement women organization and access to farm technology.

Hoque (1993) showed a significant positive relationship between organizational participation of the cane growers and their use of recommended dose of fertilizers. Similar relationship was found in his study in case of adoption of pest management practices.

Khan (1993) revealed a positive and significant relationship with the organizational participation of the farmers and their adoption of suitable insecticides.

Hossain (1991) conducted a study in Jamalpur and observed a significant positive relationship between organizational participation of the farmers and their adoption of improved farm practices.

Parveen (1995) found group participation was negatively related in both awareness and knowledge of the farmwomen.

Alam (2004) found that organizational participation had no significant relationship with their attitude toward homestead vegetable cultivation.

Extension contact of the rural women and their contributions in agriculture

Miah *et al.* ((1994) found significant relationship between communication exposures of women of Farming System Research villages and their time spent in farming activities.

Miah and Rahman (1995) found that communication exposure had significant positive relationship with their awareness on farming environment.

Khan (1983) revealed that there was a highly significant relationship between women exposure to media and their participation in community activities and income generating projects in Bangladesh.

Kashem *et al.* (1992) conducted a study to determine the relative contribution of 22 communication media in the adoption of 1) modern rice technologies, 2) livestock production and 3) fish culture technologies by the farmers. The findings revealed that the farmers had highest contact with the Block Supervisors in connection with the adoption of modern rice technologies followed by neighbor, on-farm trial, radio, result demonstration, relatives, farm and home visits, ideal farmer, group discussion, pesticides dealer and so forth.

For livestock production the most effective media was the veterinary hospital followed by on-farm trial, radio and so forth while for fish culture technologies on-farm trial come out as the most effective communication media followed by radio, neighbors, fish sellers, ideal farmers and so forth.

Naher (2000) found that extension contact of rural women had significant relationship with their participation in homestead agriculture.

Alam (2004) observed that extension media contact of rural women had no significant relation with their attitude toward homestead vegetable cultivation.

Individual extension contact

Due *et al.* (1987) evaluated the impact of T & V system in Tanzania on female headed family. They showed that 20 percent small holding families had significantly fewer extension visits and fewer adoption of innovations and lower yield than contact and non-contact joint headed families.

Islam (1994) showed that rural women contact with extension agents (individual contact) of different departments was directly related with their extent of participation in agricultural income generating activities.

Begum (2001) found that individual extension contact of farm women had no significant relationship with their contribution in post-harvest activities.

Group extension contact

Parveen (1993) showed a positive significant relationship between attitude towards homestead agricultural production and group contact of women in traditional village, but in case of modern village it was insignificant.

Begum (2001) observed in her study that group extension contact of farm women had significant relationship with their contribution of post-harvest activities of boro rice.

Mass extension contact

Kumari (1988) conducted a study on the effectiveness of multimedia of rural women for health education. They got women mostly depend on local sources of information but they had favourable attitude to some extent towards the outside messages.

Kaur (1988) revealed that extension contact and mass media exposure had a significant influence upon opinion, level of knowledge and adoption of selected programs of rural women.

Gill and Shukla (1991) reported that for effective reaction of rural women towards radio program and calculated that the emphasize should be given to the different dimensions of messages such as, completeness and relevance of information, understandability and speed of presentation.

Begum (2001) found in her study that mass extension contact of farm women had no significant relationship with their contribution of post-harvest activities.

Islam (1994) found that mass media exposure of women respondents was directly related with their extent of participation in agricultural income generating activities.

Participation in decision-making and their contribution to agriculture

Hussain *et al.* (1989) conducted a research to determine the women participation in the household decision-making relating to farm level agricultural development activities. They found that decisions on short-term matters were more influenced by women while joint decisions were taken on long-term matters in purchasing of homestead and agricultural land and draft animals. Prevalence of joint decision-making process was more in large and marginal farmers. The participation of farmwomen alone appeared to be maximum in selecting of seeds (60.7%) and storage of crops (52.6%). But this tendency declined as the farm size increased.

Bala *et al.* (1993) conducted a research on "Participation of rural women in decision making" where they observed that women have been playing a significant role in most of the household decisions from the routine domestic to the very important decision relation to livestock and credit etc. But their involvement was less significant in those spheres where their physical participation is less. In case of livestock matter joint decision of husband and wife was implemented of which wife's opinion was dominant. It varied from one activity to the other with the maximum response (78 percent) for the decision regarding sale of milk and milk products followed by purchase and sale of cattle.

Bhaumik *et al.* (1996) conducted a study on "Participation of rural women in decision making" which was under taken in Sunderbans, India. They found that there were five ways in which fisherman generally take decisions about various practices related to fishery. More than half of the fishermen (51 percent) decide their own about size of fish/prawn to be harvested. This was followed by the decisions to determine the size and density of stocking material, exploitation fish/seed markets etc. This indicates that fisherman take decision of his own to getting better return. In case of wives, majority of pickle to be prepared followed by net repairing so that the fishing program of the next day by the male members was not affected. But in regard to decisions taken by husband and wife together, the highest percentage of responses were found in case of fish/prawn seed collection (51 percent) and fish/prawn seed segregation (49 percent) followed by taking loan (45 percent). Hence it was clear that involvement of rural women in Sunderbans is relatively higher in those practices, which are easier for housewives to perform. On the other hand they found that out of ten variables only six were significantly associated with performance in the practices related to fishery. The variables like cast, education, socio-economic status and urban contact performed value were

negatively related and social-participation and contact with KVK were found to be positively related.

Begum and Chakraborty (1995) found that women who economically contribute to their families get the opportunity for making decisions in matters on their own or in consultation with their husbands in a large number of matters. On the other hand the occasions for this are fewer in cases of those women who do not contribute economically.

Attitude of rural women towards homestead agriculture

Begum (2001) found that participation in decision making process of farm women had no significant relationship with their contribution in post-harvest activities.

Fatema (1995) in her study found that the correlation between problem confrontation and attitude of the farmwomen towards homestead agriculture was negatively significant i.e. women who had more favourable attitude towards homestead agricultural production face less problem in homestead agricultural activities.

Ali (1995) mentioned that agricultural knowledge of the rural women had significant positive relationship with their attitude towards working in-group in agricultural activities.

Islam (1991) conducted a study on attitude of the farmers towards technology and found that contact and non-contact farmers differed significantly regarding their attitude towards technology.

Naher (2000) found that attitude of rural women towards homestead agriculture had significant relationship with their participation in homestead agriculture.

Innovativeness of the rural women

Naher (2000) found that innovativeness of the rural women had no significant relationship with their participation in homestead agriculture.

Akanda (1994) found that innovativeness of the rural farmers had positive relationship with participation in homestead vegetable cultivation and cultivation of fruit trees.

Rahman (1973) in his study observed that there was a positive relationship between modernism as readiness to accept new experiences or openness to innovation. Therefore, modernism as used in Rahman's study is synonymous with the innovativeness of the present study.

Kashem and Halim (1991) reported that innovativeness of the farmers had significant positive correlation with their self-confidence, use of communication media in adoption of modern rice technology, use of communication media in live stock production and use of communication media in adoption of total agricultural technology.

CHAPTER III

METHODOLOGY

The farm household survey method was principally used to collect data for the study. On the other hand the researcher was careful in using the methodology with clear understanding to get the results of scientific merit. It is believed that the proper methodology must be so designed that, a competent scientist will be able to repeat this study without any difficulty.

Locale of the study

Rajshahi district was purposively selected as the locale of the study. It is composed of eight upazilas namely Tanore, Mohonpur, Bagmara, Paba, Puthia, Godagari, Charghat and Bagha. Two, out of eight upazilas were randomly selected which are Paba and Tanore (Fig. 1). Two villages from Paba upazila and two villages from Tanore upazila were the representative villages of the study, which are randomly selected. Multistage random sampling was used to select the representative villages. Rural women of both the upazilas had almost similar cultural, economic and social status. Narikelbaria and Khorkhori village from Paba upazila and Talanda and Haridebpur villages from Tanore upazila comprised the study areas.



Fig. 3.1 Map of Rajshahi District

Unit of analysis

In this study the unit of analysis was the rural women and their household of the representative villages. Women of the household producing vegetable, poultry, dairy, fish and tree in the year 2003-2004 were the unit of analysis. Farmers are mainly responsible for fieldwork in producing boro rice, pulses and oil seed. But after harvest of these crops, a lot of works need to be done to get the final output, which are threshing, cleaning, drying, processing, husking, winnowing, storing etc. These works are done mainly by rural women. Data were collected from rural women, who were next to men or substitute of men in this regard.



Fig. 3.2 Map of Paba Upazila of Rajshahi District

Research design

The research design of this study is descriptive and explanatory in nature. That is the main purpose of this study is to describe and explore the specific situation namely, where and how far a rural woman contributes to the subsistence farming of her family. On the other hand, the researcher made an effort to test the hypotheses between the contribution of rural women homestead agricultural production and different factors associated with them. This research was also designed to see the causal relationship among the variables. The study was the ex-post facto. Because researcher had no direct control over variables, which

influenced the respondents. Their contributions in those activities were considered as the dependent variables in this study. On the other hand personal observations, discussion with extension personnel and other researchers, past experiences of researcher, review of different books and journal helped the researcher to select a number of variables. But due to time and resource constraints finally sixteen independent variables of the women were selected for the study.

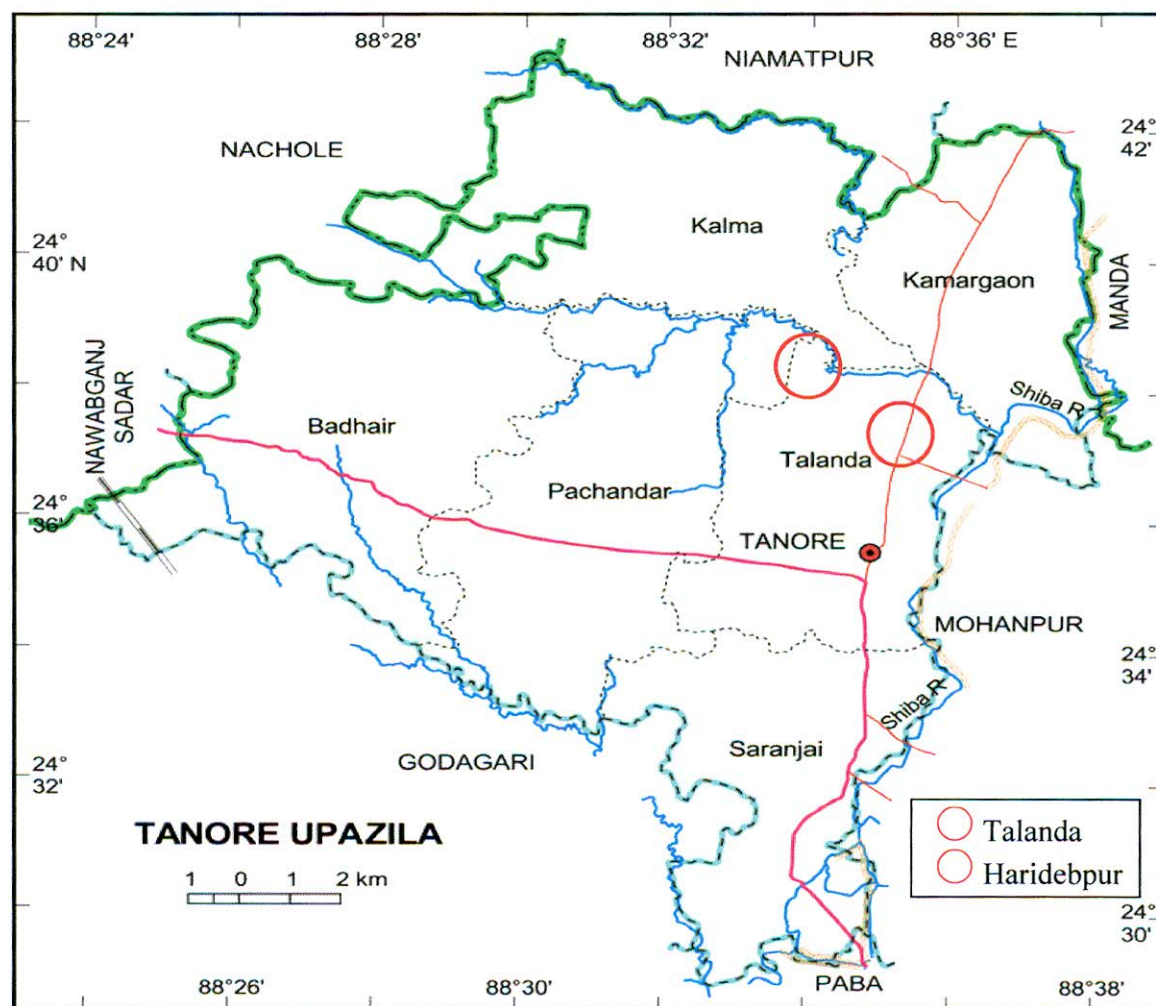


Fig. 3.3 Map of Tanore Upazila of Rajshahi District

Sampling technique

An up to date list of all the farm households of the selected four villages who produced homestead agricultural production in the preceding year (2003-2004)

of data collection and their land holdings were prepared separately through a preliminary survey (Appendix I). For this, help was sought from the concerned village elites and agricultural extension worker (SAAO). Al together 2000 farm households were selected as population and principal rural women of these households constituted the population (63 for Narikelbaria, 37 for Khorkhori, 72 for Talanda and 28 for Haridebpur) on the basis of their landholding size of that year. Rural women in each sampled village were categorized (on the basis of BBS, 2004) into marginal (having land 0.20 - 0.364 ha.), small (land 0.365-1.00 ha.) and medium farmer (1.01-3.03 ha.). Hence, stratified random sampling technique was used to select respondents. Ten percent of the population was randomly selected from each group (Table 3.1).

Table 3.1 Respondent rural women selected through stratified random sampling method

Sl. No.	Name of Village	No. of population of different categories				Sample size				Reserve list of different categories			
		Marginal	Small	Medium	Total	Marginal	Small	Medium	Total	Marginal	Small	Medium	Total
1	Narikelbaria	150	360	120	630	15	36	12	63	2	2	2	6
2	Khorkhori	90	180	100	370	9	18	10	37	2	2	2	6
3	Talanda	120	400	200	720	12	40	20	72	2	2	2	6
4	Haridebpur	50	130	100	280	5	13	10	28	2	2	2	6
Total		410	1070	520	2000	41	107	52	200	8	8	8	24

Variables of the study

The 16 selected characteristics of the women were the independent variables of the study. These characteristics included their age, education, physical fitness, family type, family size, farm size, annual income, farming experience, training exposure, organizational participation, individual extension contact, group extension contact, mass extension contact, participation in decision making process regarding homestead agriculture, attitude toward homestead agriculture and innovativeness.

The contribution in homestead agricultural activities of women in vegetable cultivation, post-harvest activities, poultry raising, live-stock rearing, tree plantation and fish cultivation were the dependent variables of the study.

Measurement of independent variables

Procedures followed for measurement of each of the independent variables are described below-

1. **Age:** Age of the respondent was defined as the period from her birth to the time of interview. The respondent was asked to mention her age in terms of years completed. One score was assigned for one completed year.
2. **Education:** Education of farm women referred to the last grade completed in a formal educational institution. It was measured in score. One score was given for passing each grade. For example 1 was given for passing primary level, 2 for secondary level and 3 for higher secondary level and above. Zero was assigned for no schooling of rural women and 0.5 score was given for could sign only.
3. **Physical fitness:** It referred to the physical condition of the respondent to contribute in homestead agricultural activities without any physical difficulty. The respondent was asked about her physical condition, which prevents her to do this work effectively. A score 5 and 3 was given for physically well and sick respectively.
4. **Family type:** It referred to the type of household of the respondent belongs to. It was categorized in to 'nuclear' (only husband, wife, their children, mother in law or father in law) and 'Joint' (husband, wife, children, parent, brother or sister in law and their relatives living in a house or a number of houses but sharing the same kitchen, house keeping and eating arrangement). One score was assigned for 'Joint' and two for nuclear family.

5. **Family size:** Family size of a farmer was measured by computing a family size on the basis of total number of members in her family including herself, her husband, children and other dependent members. The total number of family members was considered as her family size score.
6. **Farm Size:** It was determined by using the following formula:

$$\text{Farm size} = \left\{ A + B + \frac{1}{2}(C + D) + E + F \right\} - G$$

Were,

A = Own land under own cultivation

B = Leased in (Land taken from others on lease)

C = Share in (land taken from others on borga)

D = Share in (Own land given to others on borga)

E = Homestead area

F = Others (Pond + forestry + fallow land + Nursery)

G = Leased in (Land given to others on lease)

Land holding in hectare	Score
Marginal having cultivable land holding (0.20 to 0.364 ha.)	1
Small having cultivable land holding (0.365 to 1.0 ha)	2
Medium having cultivable land holding (1.01 to 3.03 ha)	3

7. **Annual income:** It referred to the total earning of her family members in the preceding year (2003-04 cropping year) of data collection. It was measured in taka earned from various such as services, business, crop production, livestock and fish culture. All earned money by different members of the family from different sources was added to get the annual income. It was determined by asking direct questions and was categorized in to three groups as very low annual income (up to Tk. 10,000), low annual income (Tk. 10,000 to 40, 000), medium annual income (Tk. 40, 000 to 70, 000) and high annual income women (having income more than Tk. 70, 000). The total

taka earned by the family was converted into score. One score was assigned for each thousand taka.

8. **Farming experience:** It referred the years completed in doing homestead agricultural activities. It was measured in terms of years, first started the homestead agricultural activities of their production by the women upto interview time. One score was assigned for each year completion that was given on the basis of responses of farmwomen to the item no. 6 in the interview schedule. It was grouped into as less than 10 years experience, 10-20 years experience, 21-31 years experience and more than 31 years experience.
9. **Training exposure:** Training exposure of a respondent was measured based on the training received by the respondent on six aspects of homestead agricultural production from different organizations. One score was assigned for one day of training receipt.
10. **Organizational participation:** Organizational participation referred to the participation of the respondent in different formal or informal groups of government or non-government organizations. It was measured based on the nature of her participation and its duration. For computing organizational participation score of the respondent the following scale was used.

$$\text{Organizational participation} = \sum p \times d$$

Where, p = participation score, and d = Duration score

Participation score was computed in the following way:

Nature of participation	Score
No participation	0
Ordinary member	1
Holding executive position like secretary/vice president/president	2

Duration of participation score was computed in the following way:

Duration of participation	Score
Nil period	0
Up to 1 year	1
2 years	2
3 years	3
4 years	4
5 years	5
10 years and above	10

Organizational participation score of a respondent was computed by adding the scores based on the above-mentioned formula for activities of the respondent in the respective organization.

11. **Individual extension contact:** It was measured by computing the respondent's exposure score based on her extent of exposure with 13 selected changed agents.

Nature of exposure	Score assigned
Never	0
Rarely (1-2 times per year)	1
Occasionally (1 – 2 times per three month)	2
Frequently (2 – 3 times per month)	3
Regularly (1 – 2 times per week)	4

Individual extension media exposure scores of a respondent was computed by adding her scores for exposure with all the individual extension media. The score of a respondent could range from 0 to 52.

12. **Group extension contact:** The group extension contact of a respondent was measured by computing a group exposure score on the basis of respondent's extent of exposure with selected 4 groups media (which was shown in item

no. 9 in the interview schedule). The score of exposure of the respondent was assigned like individual media exposure. The score of a respondent on group extension contact was determined by adding the respondent scores for exposure with all the group media. The score of a respondent could range from 0 to 16.

13. **Mass extension contact:** The mass extension contact of a respondent was measured by computing the respondent exposure score on the basis of her extent of exposure with six selected mass media (as shown in the item no. 9 of the interview schedule). Score was computed for exposure of a respondent as was done in case of individual exposure. The mass extension contact score of a respondent was determined by adding the respondent's scores for exposure with all the mass media. This score of a respondent could range from 0 to 24. Zero indicating no exposure and 24 indicating high exposure.

14. **Participation in decision making process:** It referred the way in which the women generally take decision about various practices related to homestead agricultural production. The decision making process of rural women about homestead agricultural production in their household was measured by rating scale. The score was assigned in the following ways:

Nature of decision making	Score assigned
By husband and wife	4
By wife alone	3
By husband alone	2
By relatives	1

15. **Attitude towards homestead agriculture:** Attitude of the women towards homestead agricultural production was measured by using a five-point Likert type scale. There were eight favorable (positive) and eight unfavorable (negative) statements against which the respondents indicated whether they "strongly agree", "agree", "undecided", "disagree" or "strongly disagree".

Scores were assigned to the above five responses as 5, 4, 3, 2 and 1 respectively for positive statement and scoring were reversed in case of negative statements. The attitude towards homestead agriculture score of a respondent was obtained by adding her scores for all the 16 statements.

16. **Innovativeness:** In the present study, innovativeness referred to the extent of adopting modern agricultural, social and other innovations by the rural women in relation to the time of use. Innovativeness was measured by adding scores against ten innovations with the help of a scale. Scores were assigned to each of the innovations in the following way:

Response	Weight
Do not use	0
Using from this year	1
Has been using since last 2 years or above	2

Measurement of Dependent variables

To measure contribution, 10 items were selected under each of the activities, which are as follows:

a. Items of contribution in homestead vegetable cultivation

- i. Land selection
- ii. Bed preparation by using spade
- iii. Application of manures and fertilizers
- iv. Sowing/transplanting
- v. Mulching after transplanting of seedlings
- vi. Irrigation/drainage
- vii. Weeding
- viii. Support arrangement for creeper vegetables
- ix. Harvesting of crops
- x. Collection and preservation of seeds

b. Items of contribution in post-harvest activities

- i. Threshing — Rice
— Other crops
- ii. Winnowing — Rice
— Other crops
- iii. Drying — Rice
— Other crops
- iv. Grading — Potato
— Other crops
- v. Storing — Rice
— Other crops

c. Items of contribution in poultry raising

- i. Collection of hen
- ii. Making poultry house
- iii. Cleaning the poultry house
- iv. Feeding
- v. Collection and preservation of eggs
- vi. Arrangement for hatching eggs
- vii. Care of the chicks
- viii. Arrangement for vaccination
- ix. Selling eggs
- x. Selling birds

d. Items of contribution in livestock rearing

- i. Collection of livestock
- ii. Grazing in the field
- iii. Collection of livestock from the field during evening
- iv. Collection of leaves for feeding
- v. Care during pregnancy
- vi. Looking after the kids
- vii. Clothing during winter
- viii. Vaccination
- ix. Nursing during labour
- x. Selling

e. Items of contribution in tree plantation (fruit and timber)

- i. Preparation of seedbed
- ii. Collection and raising seedling
- iii. Plantation tree seedling
- iv. Nursing and care of tree seedling
- v. Irrigation and manuring
- vi. Protective measure
- vii. Control disease and pest
- viii. Training/pruning
- ix. Fruit harvesting
- x. Selling fruits and timbers

f. Items of contribution in fish cultivation

- i. Dike repairing
- ii. Removal of weed
- iii. Rotenone application
- iv. Application of lime
- v. Application of fertilizers
- vi. Preparation of feeding ring
- vii. Selection of species
- viii. Application of feed
- ix. Harvesting
- x. Selling

Thus, 60 items were selected to measure contribution. The respondents were asked to indicate their extent of contribution to each of the above 60 items along with a three-point scale: "no contribution", "occasional contribution" and "regular contribution". These scales of responses were given scores of 0, 1 and 2, respectively. The contribution score of a rural woman was obtained by summing her scores for all the 10 items included in a particular activity of homestead agricultural production (such as homestead vegetable cultivation, post-harvest activities, tree plantation, poultry raising, livestock rearing and fish cultivation). Thus, the contribution score of a rural women under each of the 6

areas of homestead agriculture could range from 0 - 20, zero indicating no contribution and 20, very high contribution.

For better understanding of comparative contribution of rural women on 10 items in each of the activities, a contribution index (CI) was computed using the following formula:

$$CI = (P_{nc} \times 0) + (P_{oc} \times 1) + (P_{rc} \times 2)$$

Where,

P_{nc} = Percentage of rural women with no contribution

P_{oc} = Percentage of rural women with occasional contribution

P_{rp} = Percentage of rural women with regular contribution

The range of score of contribution index could be 0 to 20 for any item of the six types of contribution, 0 indicating no contribution and 20 regular contributions.

Constraint Analysis

The constraint analysis was done by adapting the methodology of Sagar (1983). The respondents were asked through an open-ended question to mention five constraints faced in contributing of homestead agricultural production in order of importance. The constraints mentioned by the respondents were given scores according to their importance. A score of 5 was assigned to a constraint for mentioning it as the "1st most important constraint", 4 for mentioning it as "2nd most important constraint", 3 for "3rd most important constraint", 2 for "4th most important constraint" and 1 for "5th most important constraint". In order to determine the relative overall importance of the identified constraints, a constraint index was computed as follow:

$$CI = 5 \times f_1 + 4 \times f_2 + 3 \times f_3 + 2 \times f_4 + 1 \times f_5$$

Where,

C_1 = Constraint index

f_1 = Frequency of women mentioning the constraint as "1st most important"

f_2 = Frequency of women mentioning the constraint as “2nd most important”

f_3 = Frequency of women mentioning the constraint as “3rd most important”

f_4 = Frequency of women mentioning the constraint as “4th most important”

f_5 = Frequency of women mentioning the constraint as “5th most important”

Thus, the higher the constraint index of a constraint the higher was its rank in terms of its degree of severity.

Data Collection Procedure

The data collection procedure was accomplished by the following way:

- a) Data collecting instrument
- b) Validity and Reliability of Scales used:
 - i. Validity of the scale
 - ii. Reliability of the scales
- c) Data collection

Data Collecting Instrument

An interview schedule was prepared to collect necessary and relevant information according to the objectives of the study. A copy of the interview schedule appears in Appendix II and III. The schedule contained both open and close type of questions. However, some scales were constructed by selected statements consistent and relevant for measuring the variables like attitude toward homestead agriculture. These measuring scales were primarily selected on the basis of review of literature, expert opinions, farmer’s experience, and researchers own experience. A pre-test was run among 30 women with the schedule and necessary revision, modifications and changes were made before its final use in the field.

Validity and Reliability of Scales Used

Giving proper attention to validity and reliability in preparing data collecting instrument is very much important for a researcher. An instrument is considered valid when it measures what it intends to measure and reliable if it yields consistent results after repeated measurement on the same subject under similar conditions. In the present study enough care was taken to prepare the interview schedule in general and scale in particular. However, validity and reliability of the scales used for measuring women's contribution in homestead agriculture of vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation and attitude toward homestead agriculture according to scientific procedure.

Validity of the Scales

Items of the scales were selected through review of literature and discussion with experienced researchers, extension personnel, extension specialists and members of supervisory committee. Moreover, after administering the scales on the non-sampled similar respondents, all the scale items of the concerned variables under study were selected on the basis of appropriate statistical significant values. Besides, the researcher consulted with some of her colleagues, who had experience in similar type of research work to maintain force validity of the research instrument. The researcher also consulted with statisticians and agronomist to verify the questions set for survey in fulfilling content validity criteria. Above all the study used a combination of research methodology that ensured high external validity of the data particularly dealing with empirical relationship between the concerned variables.

Reliability of the Scales

In this study the variables were measured using standard scales developed and suggested by different authors and experts. Therefore, the reliability of some

other variables viz. contribution in different items of homestead agriculture and attitude toward homestead agriculture of the respondents were tested through test-retest method. For this purpose, the scales were administered twice among 30 women of the study area, not included in the sample at an interval of one month. The reliability coefficient between two sets of scores were for vegetable cultivation 0.85, post-harvest activities 0.83, poultry raising 0.90, livestock rearing 0.89, tree plantation 0.83, fish cultivation 0.85 and attitude toward homestead agriculture 0.85. All the values of correlation coefficient were significant at 1 percent level of probability. Therefore, the scales used for measuring these variables were reliable, representative, adequate and worthwhile which are considered cornerstone of reliability of scales.

Data Collection

Data were collected through face to face interviewing using the already prepared interview schedule by the researcher herself. In addition, study of available records and observation of the situation were also made. During data collection, necessary co-operation was obtained from the local people as well as localities. However, the researcher explained the questions wherever necessary and in this way she took possible care to avoid misunderstanding or confusions in getting correct response. Data were collected during the period from November 2005 to January 2006.

Data Processing and Analyses

Data collected for the study were systematically recorded, edited, arranged, compiled, tabulated, computerized and analyzed in accordance with the objectives of the study. The computer software like Microsoft Excels and SPSS were used to analyze the data. The following statistical treatments were used to describe, represent and explanation of the relationships among variables included in the study:

Descriptive statistical measures such as frequency, range, mean, percentage distribution, standard deviation, rank order, categories and indices etc. were used to describe and interpret the data.

For exploring relationships between any two variables Pearson's Product Moment Correlation (r) was used. Linear regression analysis was also employed to determine the contribution of independent variables to the dependent variables.

Regression analysis usually deals with the explanation and prediction of a given variable based on one or more variables. The stepwise multiple regression analysis was used to determine the amount of variation in dependent variables due to per unit change in independent variables only those variables, which contributed significantly.

The predictive power of the multiple regression equation was evaluated by the help of multiple correlations of coefficient (r) and coefficient of multiple determinations (R^2) analysis. The coefficient of determination measures the proportion of variability in the dependent variable. Path analysis was also done thorough use of standardization partial regression coefficient known as beta weights in order to determine the extent of direct and indirect influence of the independent variables towards dependent variable.

Five percent (0.05) level of probability was used as the basis for the rejection of any null hypothesis throughout the study.

Hypotheses

According to Kerlinger (1973) a hypothesis is a conjectural statement of the relation between two or more variables. Hypotheses are always in declarative sentence form and they are related, either generally or specifically from variables to variables. In broad sense hypotheses are divided in to two categories: (a) Research hypothesis (b) Null hypothesis.

Research hypotheses

To find out relationship between variables, a researcher first formulates research hypothesis which narrates anticipated relationships between variables. Based on review of literature and development of conceptual framework, the following research hypotheses were formulated.

Each of the 16 selected characteristics (age, education, physical fitness, farming experience, organizational participation, individual extension contact, group extension contact, mass extension contact, family type, family size, decision making, training exposure, farm size, annual income, attitude toward homestead agriculture and innovativeness) of the women will have significant contributions to their perform in homestead agricultural production of vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation.

However, when researcher tries to perform statistical tests, then it becomes necessary for formulating a null hypothesis.

Null hypotheses

A null hypothesis states that there is no relationship between the concerned variables. The following null hypotheses were formulated to explore the relationship. Hence, in order to conduct tests, the earlier research hypotheses were converted into null form as follows:

Each of the 16 selected characteristics (age, education, physical fitness, farming experience, organizational participation, individual extension contact, group extension contact, mass extension contact, family type, family size, decision making, training exposure, farm size, annual income, attitude toward homestead agriculture and innovativeness) of the women will have no significant contributions to their perform in homestead agricultural production of vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation.

CHAPTER IV

RESULTS AND DISCUSSION

In the present study, the term "contribution" refers to taking part fully or partially in different events of homestead agricultural activities by women. In fact women (here, housewives) contribute in various agricultural activities within the homestead areas. However, in this piece of study, six activities viz. homestead vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, fish cultivation and tree plantation have been selected to measure extent of women contribution.

Findings have been conveniently presented in six sections in this chapter as per objectives of the study.

SECTION I

Selected characteristics profile of women

The selected characteristics were personal, social, economic and psychological attributes of the women.

Age

Age of the women ranged from 18 to 61 years with an average of little over 38 years. Based on the age levels they were grouped into four categories such as 18-28 years, 29-39 years, 40-50 years and 51-61 years.

Table 4.1.1 Distribution of women according to their age level

Categories according to age levels	Women		Mean	Standard Deviation
	Number	Percent		
18 - 28 years	36	18	38.16	10.65
29 - 39 years	60	30		
40 - 50 years	88	44		
51 - 61 years	16	8		
Total	200	100	Max = 61, Min = 18 Range = 43	

Obviously women of different age levels (18 - 61 years) were involved in homestead agricultural activities of selected item. Nevertheless, majority of them (74 percent) were between 29-50 years. Apparently women with this range of ages had much experiences and they were physically able in performing the homestead agricultural activities properly (Table 4.1.1). Almost similar findings were also reflected in the study of Bhuiyan (1987), Islam (1997) and Sarker (1997). Younger farmers generally tend to have broader outlook and have much social as well as mass media contact than the older farmers. It helps to become more aware and conscious about agricultural development. On the other hand, in our rural society, an individual usually settles down with farming or any other profession independently during middle age and continues longtime up to the old age.

Education

Based on the educational scores, the respondents were classified as - no schooling (17 percent), can sign only (24 percent), primary level education [class I to V, (33 percent)], secondary level of education [class VI to X, (12 percent)] and higher secondary level (14 percent).

Table: 4.1.2 Distribution of women according to their educational level

Categories as per educational levels	Women		Mean	Standard Deviation
	Number	Percent		
No schooling	34	17	1.11	0.94
Can sign only	48	24		
Primary (Class I - V)	66	33		
Secondary (Class VI - X)	24	12		
Higher secondary	28	14		
Total	200	100	Max = 3.00, Min = 00 Range = 3.00	

One-third proportion (33%) of the study group had primary level education while 26 percent had secondary level or higher secondary level of education. On the other hand, 17 percent had no schooling and 24 percent could write their names only.

Education helps the women to broaden their outlook and expand mental horizon by helping them to develop favourable attitude and correct perception. An educated individual is likely to be more responsive to the modern facts and ideas. Halim (1982) conducted a study on contribution of schooling in agricultural production and found that farmers having upto secondary level of education contributed positively to farm production.

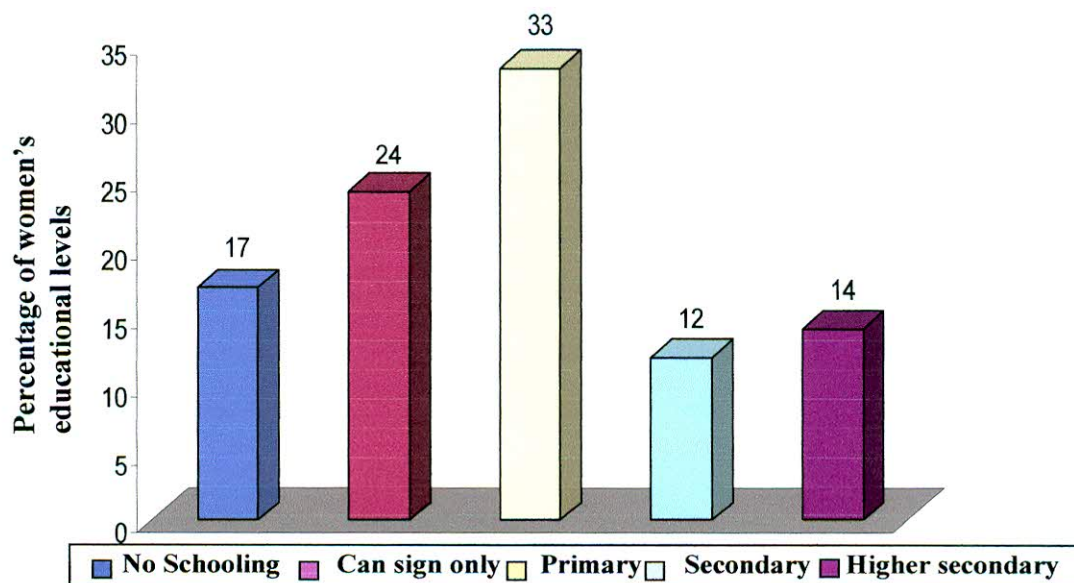


Figure 4.1 Bar graph showing the distribution of women according to their educational score

Physical fitness

During homestead agricultural activities vast majority of the women (94 percent) were physically well. About 6 percent of them were sick. Of course all the respondents of the study group contributed in homestead agricultural activities but the extent of contribution of sick persons varied. However, among the sick persons nearly 67 percent of them contributed in homestead agricultural production in order to save the expenditure of hired labor, so physical sickness could not stop them from doing homestead agricultural activities in order to avoid economic hardship. In other words, they were very much conscious about their family economy. Begum (2001) in her study also found similar findings.

Table: 4.1.3 Distribution of women according to their physical fitness during contribution in homestead agricultural production

Physical fitness level of women	Women		Mean	Standard Deviation
	Number	Percent		
Physically well	188	94	4.9	0.436
Physically sick	12	6		
Total	200	100	Max = 5, Min = 3 Range = 2	

Family type

Women of the study group had two types of family. They were in nuclear family and in joint family. Majority (74 percent) of the marginal women had nuclear family, while only 26 percent belonged to joint family.

Table 4.1.4 Distribution of women based on their family type

Categories of family types	Women		Mean	Standard Deviation
	Number	Percent		
Nuclear family	148	74	1.74	0.439
Joint family	52	26		
Total	200	100	Max = 2, Min = 1 Range = 1	

As a matter of fact 74 percent of women had nuclear type family. It indicated that in near future most of the women will maintain a nuclear family because the joint family will break into nuclear family due to their personal interest of both wife and husband.

Family Size

Number of family members of the study group was in between 2 to 14 persons. The average number of family members was about 6. Based on the number of family members, women family were classified into four categories as “small” (2–4), “medium” (5–7), “large” (8–10) and “very large” family (11–14 and above). The distribution of the women according to their family size is shown in Table. 4.1.5.

Table 4.1.5 Distribution of women according to their number of family members

Categories of family size	Women		Mean	Standard Deviation
	Number	Percent		
Small family (2 – 4)	68	39	5.35	2.45
Medium family (5-7)	92	46		
Large family (8-10)	20	10		
Very large family (above 10)	10	5		
Total	200	100	Max = 14, Min = 2.0 Range = 12	

The majority (46 percent) of the women had medium family of 5-7 members compared to 39 percent of them having small and 10 percent had large family. Miah (2001) also found similar findings in his study. The family planning activities in the country had been continuing since long time and the findings of this study indicated that the performance of this programme seems to be somewhat satisfactory.

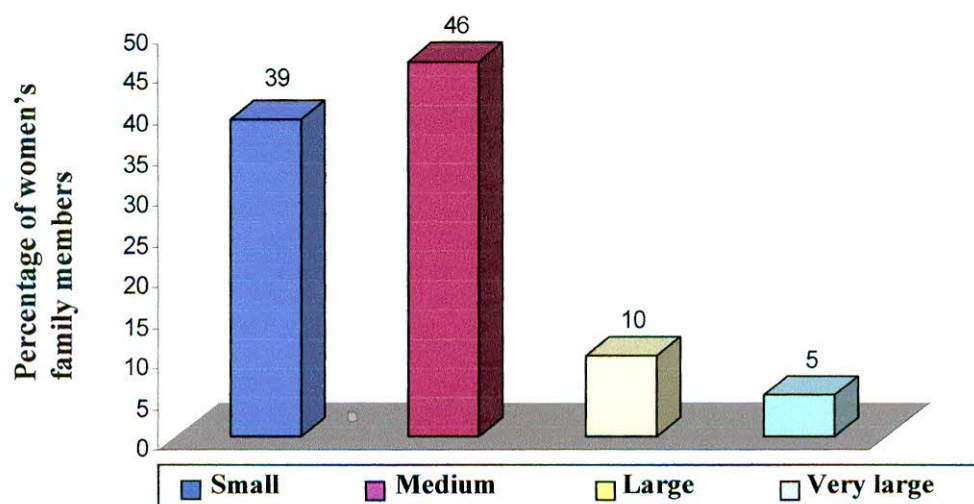


Figure 4.2 Bar graph showing the distribution of women according to their size of family members.

Farm size

The range of the farm size was 0.20 to 2.9 ha. having an average of 2.02. On the basis of the farm size the women were classified into three categories such as marginal (0.22–0.364 ha), small (0.365–1.0 ha) and medium farm (1.01–3.03 ha) families.

Table 4.1.6 Distribution of women according to farm size of their families

Categories based on farm size	Women		Mean	Standard Deviation
	Number	Percent		
Marginal (0.22 – 0.364) ha	41	20.5	2.02	0.66
Small (0.365 – 1.0) ha	107	53.5		
Medium (1.01 – 3.03) ha	52	26		
Total	200	100	Max = 3.0, Min = 1.0 Range = 2.0	

Nearly three-quarter (74 percent) of the women belonged to either small or marginal farm group. However, the average farm size of the study group was 2.02 ha. This finding has similarity with the findings of Islam (2000). In Bangladesh small farmers live on a subsistence level and this may be one of the vital reasons for their de-motivation towards adoption of improved farming practices in their homestead areas.

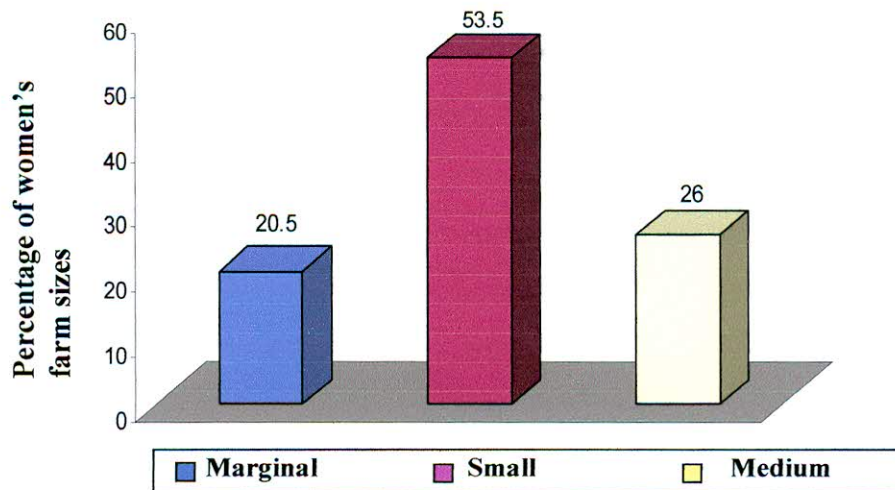


Figure 4.3 Bar graph showing the distribution of women according to their farm size category

Annual income

Annual income of the family of respondent women varied from Tk. 7 to 120 thousand having an average of Tk. 46.64 thousand. Based on annual income of the farm family, the women were classified into four categories namely very low annual income (up to Tk. 10,000), low annual income (Tk. 10,001–40,000),

medium annual income (40,001–70,000) and high annual income (above Tk. 70,000). The distribution of the women based on their annual income scores has been shown in Table. 4.1.7.

Table 4.1.7 Distribution of women according to their family’s annual income scores

Categories	Women		Mean	Standard Deviation
	Number	Percent		
Very low income (up to Tk. 10,000)	22	11	46.64	25.12
Low income (Tk. 10,001-40,000)	60	30		
Medium income (Tk. 40,001 – 70,000)	98	49		
High income (above Tk. 70,000)	20	10		
Total	200	100	Max = 120.0, Min = 7.0 Range = 113.0	

Nearly 41 percent of the women had “very low” to “low” annual income. This indicated that the economic condition of the families were very poor. Most of them were below subsistence level and had little opportunities for alternative income generating activities. On the other hand 49 percent had medium income and 10 percent belonged to high annual income groups.

Islam (2000) also found similar average of annual income in his study. The gross annual income of women is an important indicator of how much she can invest in her farming and as a result she may adopt modern technologies.

Farming experience in homestead agricultural production

The farming experience scores of the women ranged from 3 to 40 years. The mean and standard deviation were 18.46 and 9.45 respectively. Considering the farming experience scores of the women, they were classified into four categories viz. “short farming experience” (<10 years), “medium farming experience” (10-12 years), long farming experience” (21-31 years) and “very long farming experience” (> 31 years). The distribution of the women is shown in Table 4.1.8. Begum (2001) and Akanda (2005) also found similar findings in their study.

Table 4.1.8 Distribution of women based on experiences in homestead agricultural production

Categories as per experience levels	Women		Mean	Standard Deviation
	Number	Percent		
Short farming experience (< 10 years)	42	21	18.46	9.45
Medium experience (10-20 years)	66	33		
Long experience (21-31years)	78	39		
Very long experience (> 31 years)	14	7		
Total	200	100	Max = 40, Min = 3 Range = 37	

The farming experience is helpful to increase knowledge, improve skills and change attitude of the women. It also builds confidence of the women for making appropriate decisions at the time of need. Therefore, it is expected that more the farming experience of the women the more is likely to have efficient contribution on homestead agricultural production.

Training exposure

Training exposure scores of the respondents ranged from 0 to 95 with an average of 0.30 and to standard deviation 0.84. On the basis of scores obtained women were classified in to two categories such as no training and low training received (0-5).

Table 4.1.9 Distribution of women based on training exposure

Categories of training exposure	Women		Mean	Standard Deviation
	Number	Percent		
No training	172	86	0.30	0.84
Low training received	28	14		
Total	200	100	Max = 05, Min = 00 Range = 05	

It was revealed that vast proportion of the respondents (86 percent) did no receive any agricultural training. Begum (2001) and Akanda (2005) also

reported similar findings of poor training exposure of vast majority of respondent in their study area. Though the women were very much involved in homestead agricultural activities but they were rarely considered by agricultural extension organization for the same. The importance of these training facilities might not fully realize by the organization. Training generally increases knowledge and skills of individuals, which they can apply to performing of homestead agricultural activities. Training experience is an important factor, which enhances demand of knowledge and improves skill on various aspects of agricultural technologies.

Organizational participation

Women participated in five different organizations. Highest numbers of them were involved in Grameen Bank followed by ASA, BRAC, BRDB and PROSHIKA. None of the respondent was involved in DAE and CARE. However, the scores of their participation varied from 0 to 12. The average scores were 2.14 and standard deviation was 2.93. Based on obtained scores, women were classified into four categories such as no participation (0), low participation (1–3), medium participation (4–6) and high participation (6 and above).

Table 4.1.10 Distribution of women according to their organizational participation

Categories according to organizational participation	Women		Mean	Standard Deviation
	Number	Percent		
No participation	108	54	2.14	2.93
Low participation (1 – 3)	38	19		
Medium participation (4 – 6)	38	19		
High participation (above 6)	16	8		
Total	200	100	Max = 12, Min = 00 Range = 12	

A major proportion, 54 percent of the women had no participation in any organization. A total 19 percent had medium participation and 19 percent of the

respondent also had low participation followed by high participation (8 percent). Begum (2001) and Akanda (2005) also reported similar findings of poor organizational participation of majority of the respondent in their study.

Participation in different organizations brings an individual to come in contact with persons of different occupational and social status. This may broaden his/her outlook and vision. Organizational participation helps in identifying the problems and find out their solution.

Individual extension contact

Women of the study area used a wide range of information media in getting necessary farm information. Through individual extension contact they received maximum amount of information from their relatives, followed by neighbour, SAAO, ASA worker, AEO and UAO. However, the average scores achieved by the women regarding individual extension contact was 4.49 and the standard deviation was 3.61. The women were classified into four categories based on score obtained as no individual extension contact, less individual extension contact (1–5), medium individual extension contact (6–10), and high individual extension contact (above 10).

Table: 4.1.11 Distribution of women based on individual extension contact scores

Categories according to individual extension contact (scores)	Women		Mean	Standard Deviation
	Number	Percent		
No individual extension contact	20	10	4.49	3.61
Low individual extension contact (1 – 5)	116	58		
Medium individual extension contact (6 – 10)	48	24		
High individual extension contact (above 10)	16	8		
Total	200	100	Max = 17.0, Min = 00 Range = 17	

From Table 4.1.11 it is indicated that 10 percent of the women had no individual extension contact. More than half (58 percent) of the women had low individual extension contact but more than one-fifth (24 percent) had medium individual extension contact. Miah (2001) also reported similar findings of poor communication exposure of vast majority of the farmers in his study area.

Group extension contact

Considerable number of women participated in group discussion and then training. The average scores of group extension contact of the respondents were 3.14. Based on the scores obtained, respondents were classified into four categories. They were designated as: no group extension contact, low group extension contact (1–4), medium group extension contact (5–8) and high group extension contact (above 8).

Table: 4.1.12 Distribution of women based on group extension contact scores

Categories based on group extension contact	Women		Mean	Standard Deviation
	Number	Percent		
No group extension contact (0)	80	40	3.14	3.71
Low group extension contact (1 – 4)	66	33		
Medium group extension contact (5 – 8)	34	17		
High group extension contact (above 8)	20	10		
Total	200	100	Max = 15.0, Min = 00 Range = 15	

Large proportion (40 percent) of the study group were not involved in extension group contact. A little over 33 percent had low group extension contact, which was followed by medium group extension contact and high group extension contact.

Mass extension contact

Women received maximum amount of information from Radio and TV. They also got information from poster, agricultural exhibition, paper and leaflet. The scores obtained by the women in using mass extension contact were between 0–

11 with an average score of 2.29 and standard deviation was 2.82. Based on scores obtained, women were classified into four groups which were no mass extension contact, low mass extension contact (1–4), medium mass extension contact (5–8) and high mass extension contact (above 8).

Table: 4.1.13 Distribution of women based their mass extension contact scores

Categories based on mass extension contact	Women		Mean	Standard Deviation
	Number	Percent		
No mass extension contact (0)	90	45	2.29	2.82
Low mass extension contact (1 – 4)	70	35		
Medium mass extension contact (5 – 8)	34	17		
High mass extension contact (above 8)	6	3		
Total	200	100	Max = 11.0, Min = 00 Range = 11.0	

From the Table it is indicated that total forty five percent of the respondents had no mass extension contact. In Bangladesh there are two national broadcasting media such as Radio and TV, which may not reach the study group effectively. Because 74 percent of them were either small or marginal women, probably they did not have the ability to purchase Radio or TV. As a result women were not exposed to mass media. On the other hand, written materials (to create the awareness of the women) on various aspects were rarely available to the women except issues on political elections. About 35 percent had low mass extension contact followed by medium mass extension contact (17 percent).

Participation in decision making process regarding homestead agricultural production

The decision making score achieved by women regarding homestead agricultural production were from 66 to 232. The average score was 139.34 and standard deviation was 33.24. On the basis of scores obtained by the women, they were classified into three categories as: low participation (66–116), medium participation (117–167) and high participation (above 167).

Table 4.1.14 Distribution of women based on participation in decision making scores

Categories on level of decision making	Women		Mean	Standard Deviation
	Number	Percent		
Low participation (66-116)	60	30	139.34	33.24
Medium participation (117-167)	98	49		
High participation (above 167)	42	21		
Total	200	100	Max = 232.0, Min = 66.0 Range = 166.0	

It was noticed that women participation in homestead agricultural production were very much significant. It was observed that there were four ways in which women made decisions regarding homestead agricultural production of vegetable cultivation, post-harvest activities, poultry rearing, livestock rearing, fish cultivation and tree plantation. Begum (2001) and Hossain *et al.* (1989) reported similar findings of their study.

Attitude of women towards homestead agriculture

Attitude score of the women was computed using five-point Likert type scale against eight positive and eight negative questions. The possible score for each respondent could range from 16 to 80. However, the computed attitude score ranged from 16 to 72 with an average of 44.37 and standard deviation of 16.38. Respondents were classified into three categories on the basis of their attitude score as shown in the Table below.

Table 4.1.15 Distribution of women according to their attitude towards homestead agriculture

Categories based on attitude towards homestead agriculture	Women		Mean	Standard Deviation
	Number	Percent		
Less favourable (16-36)	84	42	44.37	16.38
Moderately favourable (37 – 56)	56	28		
High favourable (57 – 76)	60	30		
Total	200	100	Max = 72, Min = 16 Range = 56	

From Table 4.1.15 it is indicated that highest percentage (42%) of respondents had less favourable attitude, 30 percent had highly favourable while 28 percent expressed in moderately favourable attitude towards the homestead agricultural activities. Naher (2000), Alam (2004) and Haque (2002) also reported in their study vast majority of the farmers had less favourable attitude towards the homestead agricultural production. Education, knowledge etc. are factors that influence persons to change their attitude. Again, contact with extension agents result positive changes in attitude towards productive activities and new technologies. So, more extension agents should be employed by GOs and NGOs to reach the women to involve them in development activities.

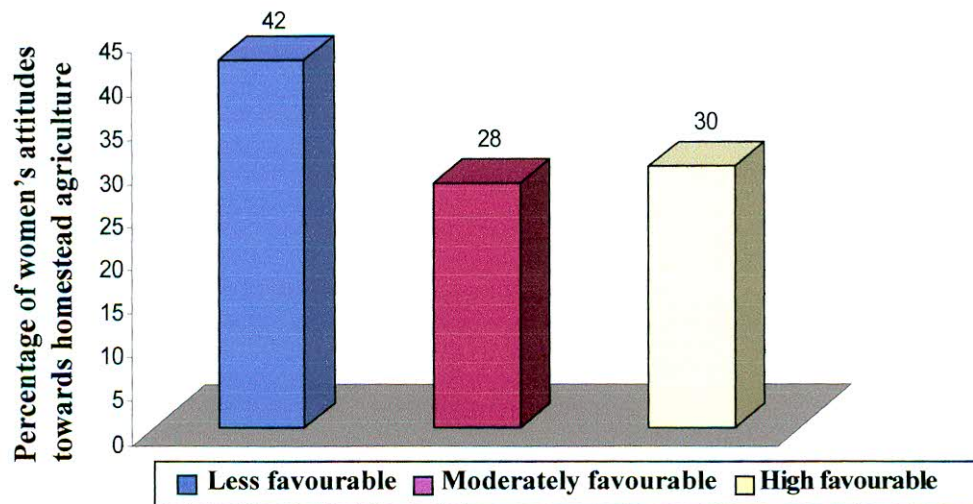


Figure 4.4 Bar graph showing the distribution of women according to their attitude towards homestead agriculture

Innovativeness of the women

The innovativeness score of the respondents could range from 0 to 20. The computed score for innovativeness of the respondents ranged from 0 to 20 with an average of 9.76 and standard deviation of 4.69. On the basis of scores for innovativeness, the respondents were grouped into three categories as mentioned in the following Table 4.1.16.

Table 4.1.16 Distribution of women according to innovativeness

Categories based on innovativeness	Women		Mean	Standard Deviation
	Number	Percent		
Low innovativeness (0 - 6)	52	26	9.76	4.69
Moderately innovativeness (7 – 12)	98	49		
High innovativeness (13 & above)	50	25		
Total	200	100	Max = 20.0, Min = 00 Range = 20	

Results in Table 4.1.16 indicated that highest percentage (49 percent) of total respondents were moderately innovative, compared to 26 percent were less innovative and only 25 percent were highly innovative. The highest proportion (75 percent) of the women in this study had either low or medium innovativeness. The findings of the study is supported by Hossain (1996), Islam (1997) and Naher (2000). Education, extension contact, cosmopolitaness etc. influences innovativeness of women. Majority of the respondents of the study area had primary level of education and they had medium level of extension contact, which perhaps have been reflected in the innovativeness score they obtained.

SECTION II

Contribution of Women in Selected Homestead Agricultural Production

In the present study, the term “Contribution” refers to taking part fully or partially in different events of homestead agricultural production by women. In fact women (here, house wives) contribute in various agricultural and non-agricultural activities within the homestead. However, in this part of study, six activities viz. homestead vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation have been selected to measure extent of women contribution. An interval scale was used to measure contribution. There were 10 items under each of the selected activities against which points were assigned to get contribute score and also contribution index and the findings are described below.

Contribution of women in homestead vegetable cultivation

Overall contribution

Score for contribution in homestead vegetable cultivation could range from 0 to 20. The computed score for contribution ranged from 6 to 20 with an average of 13.62 and standard deviation of 3.91. The respondents were classified in to four categories based on their scores as—very low contribution, low contribution, medium contribution and high contribution. The result presented in Table 4.2.1. showed that highest percentage (47 percent) of respondents had high contribution in vegetable cultivation compared to 27 percent medium contribution, 20 percent low contribution and 6 percent had very low contribution.

Table 4.2.1 Distribution of women according to their extent of contribution in homestead vegetable cultivation

Categories	Women		Mean	Standard Deviation
	Number	Percent		
Very low contribution (up to 6)	12	6	13.62	3.91
Low contribution (7 to 10)	40	20		
Medium contribution (11 – 14)	54	27		
High contribution (15 and above)	94	47		
Total	200	100	Max = 6, Min = 20 Range = 14	

Comparative contribution in items related to homestead vegetables cultivation

There were 10 items or operations under homestead vegetable cultivation. Contribution of women in each of these 10 items were measured in score with an interval scale. Percentage distribution of women in each of the items along with contribution index and rank order has been computed to determine comparative contribution in different items and presented in Table 4.2.2. The computed contribution index of 10 items ranged from 168 to 386 against possible score of 0 to 400 with an average of 270. It is evident from Table 4.2.2 that the item, 'collection and preservation of seed' had highest contribution index (CI=386) and ranked 1st. The item 'harvesting of crops' occupied 2nd position in order of ranking with CI of 364 and "weeding", 'support arrangement' and 'land selection' was in 3rd position with CI of 300 while 'mulching' was in last position with CI of 168. It is encouraging that women are contributed in all items/operations needed for vegetable cultivation though their level of contribution varies with nature of operations. This might be due to the fact that now-a-days GOs and NGOs have taken several programmes on homestead vegetable cultivation and they are giving emphasis to involve women in vegetable cultivation. Moreover, TV, radio and other mass media are advertising that might have brought some changes in their attitude.

Table 4.2.2 Comparative contribution of women in 10 items of homestead vegetable cultivation with contribution indices (CI) and rank order

Sl. No.	Items in vegetable cultivation	Contribution of women			CI	Rank order
		Never	Occasional	Regular		
1.	Collection and preservation of seed	0	14	186	386	1
2.	Harvesting of crops	2	32	166	364	2
3.	Weeding	18	64	118	300	3
4.	Support arrangement for creeper vegetables	16	68	116	300	3
5.	Land selection for vegetable cultivation	6	88	106	300	3
6.	Bed preparation	8	100	92	284	4
7.	Application of manures and fertilizers	30	114	56	226	5
8.	Irrigation	52	104	44	188	6
9.	Sowing	52	112	36	184	7
10.	Mulching	52	128	20	168	8

Contribution of women in post-harvest activities

Overall contribution

The computed contribution score of women in post-harvest activities ranged from 0 to 20 with an average of 12.19 and standard deviation of 5.17. On the basis four categories of women as presented in Table 4.2.3. Data furnished in Table 4.2.3 indicates that highest percentage (only 43 percent) of women had high contribution in post-harvest activities and lowest percentage (14 percent) had very low contribution. Women, particularly housewives, usually perform post-harvest activities at varied extent and it has also bear reported by many authors. In the present study, in some cases there was no contribution in post-harvest activities. The reason was that they had no cropland and as such no

scope for contribution. Again, women having large farm size and high income are some times reluctant to take part in post harvest activities.

Table 4.2.3 Distribution of women according to their extent of contribution in post-harvest activities

Categories	Women		Mean	Standard Deviation
	Number	Percent		
Very low contribution (up to 6)	28	14	12.19	5.17
Low contribution (7 to 10)	32	16		
Medium contribution (11 – 14)	54	27		
High contribution (15 and above)	86	43		
Total	200	100	Max = 19, Min = 0 Range = 19	

Comparative contribution in items related to post-harvest activities

The distribution of women in 10 items of post-harvest activities presented in Table 4.2.4 showed that the highest percentage (83 percent) of women are contributing regularly in the item “storing rice” followed by “storing of other crops” (81 percent). However, the lowest percentage (7 percent) contributed in the item “threshing of other crops”. The contribution index was computed for each of the 10 items under post-harvest activities and presented in Table 4.2.4 along with rank order. The computed contribution indices ranged from 116 to 344, with an average of 243.2. Result presented in the Table 4.2.4 show that the item “storing” whether for rice or other crops was contributed by most of the women *i.e.*, the item “storing of rice” had the highest contribution index (344) with rank 1st, while “storing of other crops” had second highest CI (338). “Grading potato” and “winnowing rice” come next to the item storing and occupied 3rd and 4th position with CI of 318 and 302, respectively. However, lowest contribution index 116 was obtained in case of the item “grading of other crops”.

Table 4.2.4 Comparative contribution of women in 10 items of post-harvest activities with contribution indices (CI) and rank order

Items in post-harvest activities	Contribution of women			CI	Rank order
	Never	Occasional	Regular		
Storing – Rice	22	12	166	344	1
Storing – Other corps	24	14	162	338	2
Grading – potato	26	30	144	318	3
Winnowing – Rice	22	54	124	302	4
Drying – Rice	22	68	110	288	5
Winnowing – Other Crop	28	62	110	282	6
Drying – Others	38	118	44	206	7
Threshing – Rice	86	106	8	122	8
Threshing – Others	94	96	10	116	9
Grading – Others	98	88	14	116	9

Contribution of women in poultry raising

Overall contribution

The contribution scores of women for poultry raising ranged from 0 to 19 with an average of 13.42 and standard deviation of 4.00. Respondents were grouped into four categories on the basis of their contribution scores in poultry raising and their percentage distribution is given in Table 4.2.5. It is found that highest percentage (47 percent) of the respondents had high contribution while only 9 percent had very low contribution. It means that the poultry enterprise is mostly taken care by the women. In fact, poultry is under the jurisdiction of women and it has been one of their sources of income in most cases.

Table 4.2.5 Distribution of women according to their extent of contribution in poultry raising

Categories	Women		Mean	Standard Deviation
	Number	Percent		
Very low contribution (up to 6)	18	9	13.42	4.00
Low contribution (7 – 10)	20	10		
Medium contribution (11 – 14)	68	34		
High contribution (15 and above)	94	47		
Total	200	100	Max = 0, Min = 19 Range = 19	

Comparative contribution of women in items related to poultry raising

Ten items were selected to measure contribution in poultry raising. Distribution of the respondents in percent along with the contribution indices and rank order is presented in Table 4.2.6. The computed contribution indices against 10 items ranged from 132 to 376 with an average of 275.6. Data furnished in Table 4.2.6 showed that the item “cleaning the poultry house” had highest contribution index (CI = 376) and ranked 1st as highest percentage of respondents indicated regular contribution in this activity. “Feeding the poultry birds” ranked 2nd as it had second highest CI of 372 while “collection of eggs” occupied 3rd position with CI of 368. The item “making poultry house” attained lowest contribution index 132 as none of the women contributed this item regularly. The picture is more or less common all over the country. Lack of proper vaccination facilities as well as poor awareness are some of the reasons for lower contribution. The lower contribution of women in the items ‘selling birds’ indicates that women are very much associated with raising poultry but not associated with the produce marketing because of our existing social system.

Table 4.2.6 Comparative contribution of women in 10 items of poultry raising with contribution indices (CI) and rank order

Items in poultry raising	Contribution of women			CI	Rank order
	Never	Occasional	Regular		
Cleaning the poultry house	4	16	180	376	1
Feeding the poultry birds	4	20	176	372	2
Collection of eggs	6	20	174	368	3
Arrangement of hatching eggs	4	30	166	362	4
Care for chicks	12	48	140	328	5
Selling eggs	18	66	116	298	6
Collection of hen	50	114	36	186	7
Vaccination	94	36	70	176	8
Selling poultry birds	68	106	26	158	9
Making poultry house	84	100	16	132	10

Contribution of women in livestock rearing

Overall contribution

There were also ten items selected to measure the extent of contribution in livestock rearing. The scores obtained for contribution in livestock rearing ranged from 0 to 19 with an average of 12.0 and a standard deviation of 5.84. Respondents were classified into four categories on the basis of their contribution score in livestock rearing as given in Table 4.2.7. Data contained in Table 4.2.7 revealed that highest percentage (46 percent) of the respondents had high contribution in livestock rearing compared to 27 percent medium and 8 percent had low contribution. It is interesting to note that 19 percent of the respondents had very low contribution in livestock rearing. Probably, women having larger farm and higher income are reluctant of rearing livestock. Like poultry, livestock is another enterprise that is mostly cared by women and as such their overall contribution in livestock is also high.

Table 4.2.7 Distribution of women according to their extent of contribution in livestock rearing

Categories	Women		Mean	Standard Deviation
	Number	Percent		
Very low contribution (up to 6)	38	19	12.0	5.84
Low contribution (7 - 10)	16	8		
Medium contribution (11 – 14)	54	27		
High contribution (15 and above)	92	46		
Total	200	100	Max = 0, Min = 19 Range = 19	

Comparative contribution of women in related items for livestock rearing

Percentage distribution of women in each of the 10 selected items related to livestock rearing is shown in Table 4.2.8 along with contribution indices and rank order. Computed contribution indices against 10 items ranged from 76 to 332 with an average of 235.6. Data furnished in Table 4.2.8 revealed that

contribution of women in the item "looking after the kids" was the highest (CI = 332) and ranking 1st, "care during pregnancy" was second highest with CI of 330 and contribution in "collection of leaves for feeding" was in 3rd position with CI of 324. All of these items were very much associated with women and naturally they performed these operations and thus contribution was high, lowest contribution was observed in 'vaccination' with CI of 76 further indicated that women were not aware of scientific management of rearing livestock and there also exists poor extension services. So, extension service regarding all the homestead activities should be strengthened to increase production and farm income as well.

Table 4.2.8 Comparative contribution of women in 10 items of livestock rearing with contribution indices (CI) and rank order

Items in livestock rearing	Contribution of women			CI	Rank order
	Never	Occasional	Regular		
Looking after kids	28	12	160	332	1
Care during pregnancy	28	14	158	330	2
Collection of leaves for feeding	30	16	154	324	3
Clothing during winter	36	20	144	308	4
Collection of livestock from the field in the evening	32	30	138	306	5
Nursing	38	36	126	288	6
Grazing in the field	70	90	40	170	7
Selling	80	102	18	138	8
Collection of livestock	110	76	14	104	9
Vaccination	124	76	0	76	10

Contribution of women in tree plantation

Overall contribution

There were also ten items selected to measure the extent of contribution in tree plantation. The scores obtained for contribution in tree plantation ranged from 0 to 18 with an average of 12.06 and a standard deviation of 4.32. Respondents

were classified into four categories on the basis of their contribution score in tree plantation as given in Table 4.2.9. Results from Table 4.2.9 revealed that highest percentage (35 percent) of the respondents had high contribution in tree plantation compared to 26 percent medium and 28 percent had low contribution in tree plantation.

Table 4.2.9 Distribution of women according to their extent of contribution in tree plantation

Categories	Women		Mean	Standard Deviation
	Number	Percent		
Very low contribution (up to 6)	22	11	12.06	4.32
Low contribution (7 - 10)	56	28		
Medium contribution (11 – 14)	52	26		
High contribution (15 and above)	70	35		
Total	200	100	Max = 0, Min = 18 Range = 18	

Comparative contribution of women in related items for tree plantation

Percentage distribution of women in each of 10 selected items related to tree plantation has been shown in Table 4.2.10 along with contribution indices and rank order. Computed contribution indices against 10 items ranged from 82 to 360 with an average of 243.0.

Table 4.2.10 Comparative contribution of women in 10 items of tree plantation

Items in tree plantation	Contribution of women			CI	Rank order
	Never	Occasional	Regular		
Collection of seed	10	20	170	360	1
Nursing of seedling	12	32	156	344	2
Fruit harvesting	14	62	124	310	3
Selling fruits	14	76	110	296	4
Irrigation	12	82	106	294	5
Protective measure	38	116	46	208	6
Plantation tree seedling	56	86	58	202	7
Preparation of seed bed	46	134	20	174	8
Control diseases	68	104	28	160	9
Training and pruning	124	70	6	82	10

Results from Table 4.2.10 revealed the contribution of women in the item "collection of seed" was the highest (CI = 360) and ranking 1st, "nursing of seedlings" was second highest with CI of 344 and contribution in "fruit harvesting" was in 3rd position with CI of 310. All of these items are very much associated with women and naturally they perform these operations and thus contribution is high. Lowest contribution was observed in 'training and pruning' with CI of 82 further indicates that women are not fit for training and pruning management of trees.

Contribution of women in fish cultivation

Overall contribution

Score for contribution in fish cultivation could range from 0 to 20 with an average 11.93 and standard deviation of 3.81. The respondents were classified into four categories based on their scores as very low contribution, medium contribution and high contribution. Results presented in Table 4.2.11 showed that highest percentage (34 percent) of respondents had low contribution in fish cultivation compared to 32 percentage medium contribution, 27 percent high and only 7 percent had very low contribution.

Table 4.2.11 Distribution of women according to their extent of contribution in fish cultivation

Categories	Women		Mean	Standard Deviation
	Number	Percent		
Very low contribution (up to 6)	14	7	11.93	3.81
Low contribution (7 - 10)	68	34		
Medium contribution (11 – 14)	64	32		
High contribution (15 and above)	54	27		
Total	200	100	Max = 20, Min = 0 Range = 20	

Comparative contribution in items related to fish cultivation

Table 4.2.12 Comparative contribution of women in 10 items of fish cultivation with contribution indices (CI) and rank order

Items	Contribution of women			CI	Rank order
	Never	Occasional	Regular		
Lime application	6	36	158	352	1
Application of feed	22	20	158	336	2
Rotenone application	6	66	128	322	3
Removal of weed	8	66	126	318	4
Prepare feeding ring	18	52	130	312	5
Fertilizer application	8	154	38	230	6
Selection of species	26	118	56	230	7
Dike repairing	54	136	10	156	8
Selling	134	62	4	70	9
Harvesting	152	46	2	50	10

There were 10 items of operations under fish cultivation. Contribution of women in each of these 10 items was measured in scores with an interval scale. Percentage distribution of women in each of the items along with contribution index and rank order has been computed to determine comparative contribution in different items and presented in Table 4.2.12. The computed contribution index of 10 items ranged from 50 to 352 against possible score of 0 to 400 with an average of 237.6. It is evident from Table 4.2.12. that the item "Lime application" had highest contribution index (CI = 352) and ranked 1st. The item 'Application of feed' occupied 2nd position in order of ranking with CI of 336 and 'Rotenone application' was in 3rd position with CI of 322 while 'Harvesting' was in last position with CI if 50. It is encouraging that women are contributing in all items/operations needed for fish cultivation though their level of contribution varies with nature of operations. This might be due to the fact that now-a-days GOs and NGOs have taken several programmes on fish cultivation and they are giving emphasis to involve women in fish cultivation.

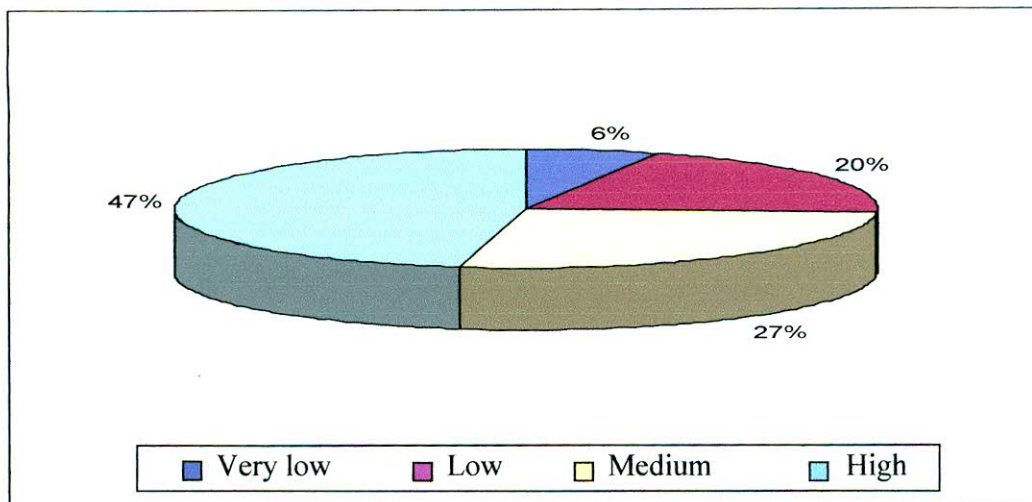


Figure 4.5 Pie graph showing the contribution of women in vegetable cultivation

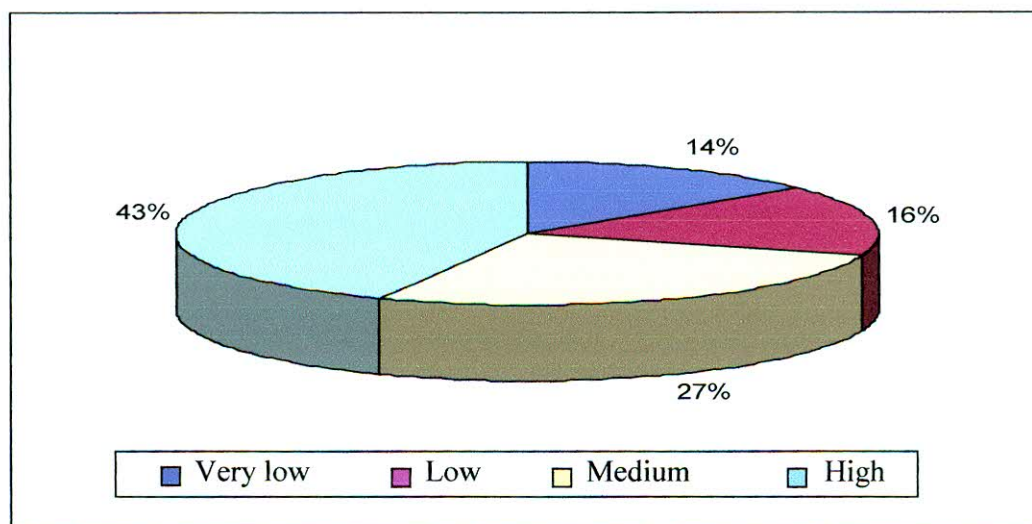


Figure 4.6 Pie graph showing the contribution of women in post-harvest activities

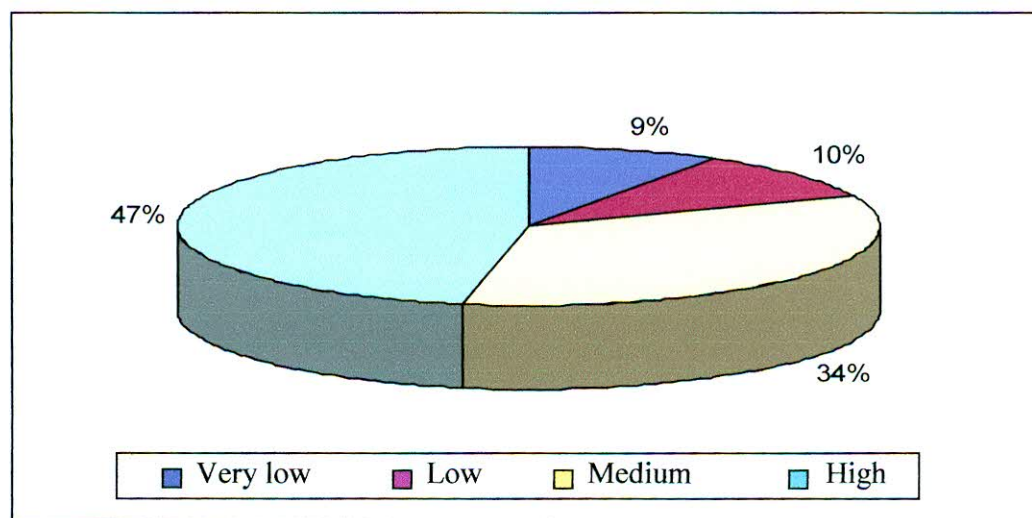


Figure 4.7 Pie graph showing the contribution of women in poultry raising

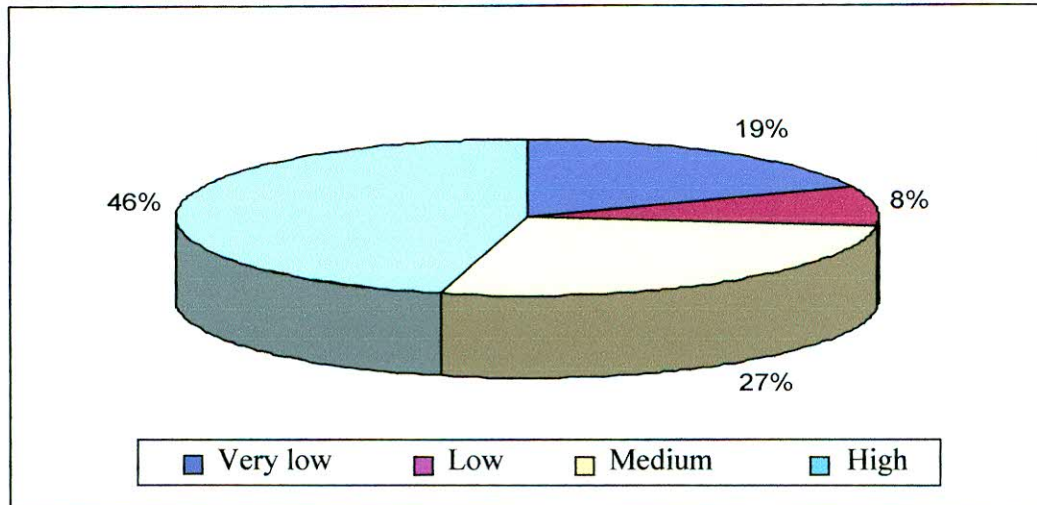


Figure 4.8 Pie graph showing the contribution of women in livestock rearing

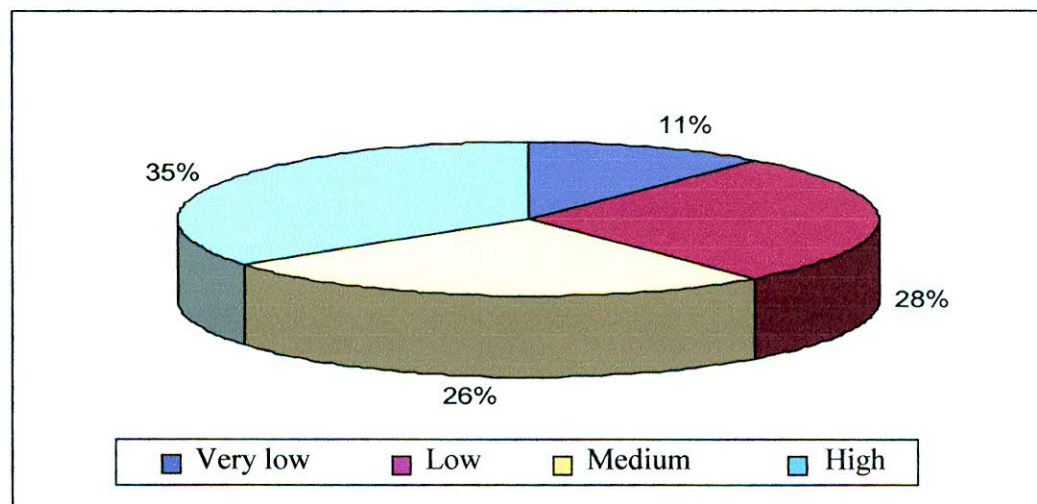


Figure 4.9 Pie graph showing the contribution of women in tree plantation

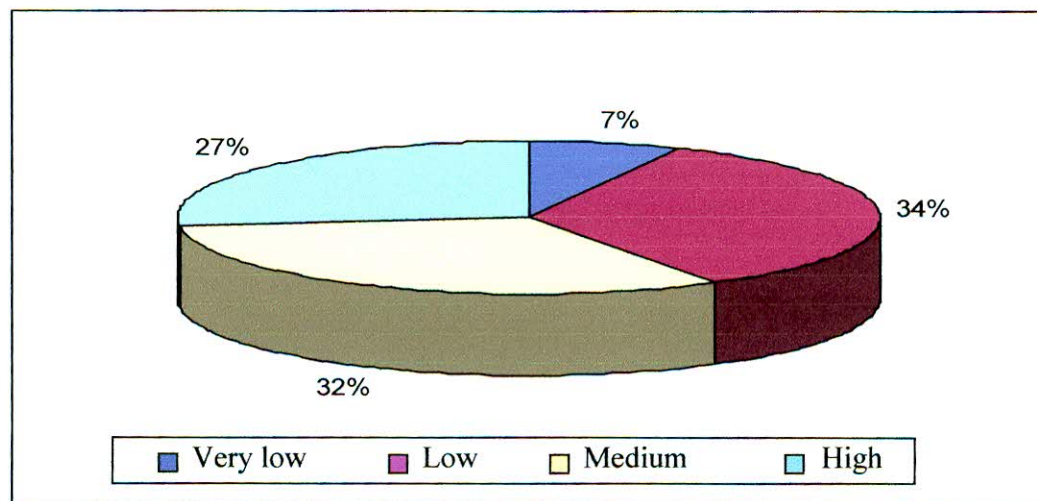


Figure 4.10 Pie graph showing the contribution of women in fish cultivation

SECTION III

Relationship between the variables, their contribution and effects

In this chapter the relationships between selected independent and dependent variables have been described.

To investigate the relationships between the dependent and independent variables and to measure the contribution and effects of independent variables to dependent variables the following statistical treatments were conducted.

- i. Pearson's correlation coefficient (r) was applied to determine the relationship between the selected independent variables and six dependent variables.
- ii. Full method and stepwise multiple regression coefficient was used to determine the contribution (R^2) of the sixteen (16) independent variables on six (6) dependent variables.
- iii. To determine the effects and contributions of independent variables to dependent variables, path coefficient analyses were used after examining the multi-co-linearity in the correlation matrix.

Pearson's correlation coefficient was used to test the ninety-six relationships. Five percent (0.05) level of probability was considered as the basis for accepting or rejecting the null hypotheses. However, relationships of those were considered statistically significant when calculated 'r' value was equal to or greater than the tabulated value at 5 percent level of probability.

Relationship between the independent and dependent variables

Table 4.3.1 Correlation coefficients (r) between the sixteen independent and six dependent variables

Sl. No.	Independent variables	Dependent variables					
		Homestead vegetable cultivation	Post-harvest activities	Poultry raising	Livestock rearing	Tree plantation	Fish cultivation
1.	Age	-0.120	-0.229*	-0.024	-0.026	-0.098	-0.081
2.	Education	0.613**	0.554**	0.393**	0.352**	0.209**	0.356**
3.	Physical fitness	-0.187**	-0.027	-0.183**	-0.047	-0.061	0.068
4.	Family type	-0.426**	-0.380**	-0.206*	-0.238**	-0.018	-0.251**
5.	Family size	0.336**	0.373**	0.175*	0.344**	0.223**	0.310**
6.	Farm size	0.374**	0.323**	0.382**	0.321**	0.312**	0.262**
7.	Annual income	0.377**	0.293**	0.288**	0.247**	0.123	0.264**
8.	Farming experience	-0.066	-0.204**	-0.084	0.003	-0.073	0.019
9.	Training exposure	0.324**	0.260**	0.230**	0.185**	0.072	0.150*
10.	Organizational participation	0.544**	0.443**	0.299**	0.297**	0.014	0.233**
11.	Individual extension contact	0.531**	0.462**	0.313**	0.368**	0.074	0.259**
12.	Group extension contact	0.449**	0.300**	0.339**	0.277**	0.007	0.177*
13.	Mass extension contact	0.430**	0.295**	0.352**	0.292**	0.144*	0.205*
14.	Decision making process	0.485**	0.414**	0.333**	0.291**	0.117	0.233**
15.	Attitude towards homestead agriculture	0.362**	0.313**	0.252**	0.245**	0.215**	0.230**
16.	Innovativeness	0.345**	0.275**	0.209**	0.344**	0.146*	0.234**

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability

Relationships of selected factors with the contribution of women in homestead agricultural production of selected items

Age

Age is an important personal variable taken for the study. Because it determines the vitality and experience of the women, which may affect the nature and the contribution in homestead agricultural production of vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation. This concept led to the null hypothesis between age of the women and contribution in homestead agricultural production at the selected items. The correlation coefficient between age and contribution in homestead vegetable cultivation ($r = -0.120$), poultry raising ($r = -0.024$), livestock rearing ($r = -0.026$), tree plantation ($r = -0.098$), and fish cultivation ($r = -0.081$) were not statistically significant to reject the null hypothesis. Nevertheless, the coefficient of correlation in case of post-harvest activities ($r = -0.229$) was sufficient to reject the null hypothesis. Begum (2001) conducted a study on contribution of farm women in post-harvest activities. She found no significant relationship between age and contribution of the women on the post-harvest activities. Haque (2002) and Naher (2000), however, found that age of the women had no significant relationship with their participation in homestead agriculture.

In the farm families generally most of the girls get married at early age and within a few years they come out as ladies and become matured, understand responsibilities, seek how they can increase family income and save the daily expenditure.

Hence, they do many household jobs including farm and non-farm related production and spent more or less similar time for homestead vegetable cultivation, poultry raising, livestock rearing, tree plantation and fish cultivation. So, age did not affect the nature and contribution for homestead agriculture except post-harvest activities.

Education

Education is generally considered as an index of the progressive-minded women. It helps her to fore see the consequence of her utilization of time during homestead agricultural production. It improves her knowledge, understanding and responsibilities and thus she becomes relatively conscious in utilizing time through improved methods of homestead agricultural production of selected items. Such consideration led to the null hypothesis of no significant nor direct relationship between women education and the homestead agricultural activities. The coefficient of correlation of vegetable cultivation ($r = 0.613$), post-harvest activities ($r = 0.554$), poultry raising ($r = 0.393$), livestock rearing ($r = 0.352$), tree plantation ($r = 0.209$) and fish cultivation ($r = 0.356$), were significant to reject the null hypothesis, suggesting that the women education had direct relationship with contribution in homestead agricultural production. Further, it is suggested that longer the schooling years better the utilization of time by the women during homestead agricultural production (Table 4.3.1). Study conducted by Naher (2000) demonstrated a significant positive relationship of education of the women with their participation in homestead agriculture.

Physical fitness

Health is one of the four fundamental needs along with food, clothing and shelter. It is a basic element of the happiness. Moreover women physical fitness has a great influence upon her family and society as well as farming activities. The above ideas led to the null hypothesis of no significant nor direct relationship between physical fitness of the women and the contribution in homestead agricultural production of vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation. The coefficient of correlation between physical fitness of the women and the contribution in post harvest activities ($r = -0.027$), livestock rearing ($r = -0.047$),

tree plantation ($r = -0.061$) and fish cultivation ($r = 0.068$) were not statistically significant to reject the null hypothesis. This indicated that though a few number of respondents were not physically fit for doing homestead agricultural activities but the nature and extent of unfitness could not stop them from performing their daily responsibilities. But the correlation coefficient of vegetable cultivation ($r = -0.187$) and poultry raising ($r = -0.183$) were statistically significant to reject the null hypotheses. In a study with women Begum (2001) found no significant relationship between physical fitness and contribution of women in post-harvest activities.

Family type

Traditional patriarchal family of Bangladesh varies from joint to nuclear family types. Position of women in nuclear family is quite different from joint family. Mother-in-law is the charge of the internal management of the household. So, women of joint family type are expected to work according to the instruction and behest of the mother-in-law. On the other hand, women of nuclear family type hold more freedom to run the household and manage the domestic work than joint family type. So, according to the family type, contribution by the women in homestead agricultural production of the stated items would be different. The above concept led to the null hypothesis of no significant nor direct relationship between family type and contribution in vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation. The correlation coefficients of vegetable cultivation ($r = -0.426$), post-harvest activities ($r = -0.380$), poultry raising ($r = -0.206$), livestock rearing ($r = -0.238$) and fish cultivation ($r = -0.251$) were negatively significant to reject the null hypothesis. Findings of Begum (2001) supported the existence of a negative relationship between the family type and contribution of women in post-harvest activities.

Family Size

Number of family members varies from family to family. They have various farming and non-farming activities. So, they need own family members or hired labours to do these activities. Farm family having more members have a scope for engaging them in various domestic and income generating activities. Generally they engage their family members in those activities, helpful for earning income for their family. Hence, women engage them to perform homestead agricultural activities. The above idea led to frame null hypothesis of no significant nor direct relationship between family size and the contribution in homestead vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation. The coefficient of correlation for vegetable cultivation ($r = 0.336$), post-harvest activities ($r = 0.373$), poultry raising ($r = 0.175$), livestock rearing ($r = 0.344$), tree plantation ($r = 0.223$) and fish cultivation ($r = 0.310$) were statistically significant to reject the null hypothesis. The facts indicated that the bigger the family size, more the time utilized by the women for homestead agricultural production of vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation. Findings of Begum (2001) supported the existence of a positive relationship between the family size and contribution of women in post-harvest activities. Haque (2002) found a significant relationship between family size and farmers attitude towards agricultural activities.

Farm size

Generally farm size is considered as an important indicator of the socio-economic condition of the farm family. It is assumed that women from large farmers family comparatively rich and educated than small and marginal farmer. Obviously they spent less amount of time in homestead agricultural production. Moreover, they are economically sound and employ hired labour to perform their farm and non-farm production. This consideration led to the null hypothesis of no significant nor direct relationship between farm size and the contribution by the women in homestead agricultural production of the stated

items. However, the correlation coefficient in the case of vegetable cultivation ($r = 0.374$), post harvest activities ($r = 0.323$), poultry raising ($r = 0.382$), livestock rearing ($r = 0.321$), tree plantation ($r = 0.312$), and fish cultivation ($r = 0.262$) were sufficient to reject the null hypothesis indicating that the larger the farm size the more contribution in homestead agricultural production. (Table 4.3.1). Present finding was also supported by another study of Alam (2004) and Haque (2002). They found significant positive relationship between farm size of the women and their attitude toward homestead agriculture.

Annual income

Annual income of women is one of the most important indicators to measure the socio-economic status of that family. Generally, it is assumed that women with high annual income are likely to use less contribution in homestead agricultural production. This logic led to frame the null hypothesis of no significant nor direct relationship between annual income and amount of contribution in homestead agricultural production of the said items. The correlation co-efficient between annual income and length of contribution in homestead vegetable cultivation ($r = 0.377$), post-harvest activities ($r = 0.293$), poultry raising ($r = 0.288$), livestock rearing ($r = 0.247$) and fish cultivation ($r = 0.264$) were statistically significant to reject the null hypothesis, indicating women who had high annual income utilized more time in homestead vegetables cultivation, post-harvest activities, poultry raising, livestock rearing and fish cultivation. It also indicated that even the women of well to do farmers wanted to save money by utilizing their self-labour. On the other hand correlation coefficient value of tree plantation ($r = 0.123$) was not enough to reject the null hypothesis. Perhaps annual low income of the farmer could not influence to produce significant amount of tree from their homestead areas. Turning to another study made by Alam (2004), it appears that the findings is in conformity with this study that annual income of the women had no significant relationship with their attitude toward homestead vegetable cultivation. In a study with Nigerian women Damisa *et al.* (2007) found that annual income had significant impact on the women's participation in agricultural production.

Farming experience

It is true that experience makes a person responsible, knowledgeable and flexible in doing any activity properly. Not only that it also helps to make him/her perfect in completing the assigned activities. Such consideration led to the null hypothesis of no significant nor direct relationship between women experience in homestead vegetable cultivation, poultry raising, post-harvest activities, livestock rearing, tree plantation and fish cultivation. The coefficients of correlation of vegetable cultivation ($r = -0.066$), poultry raising ($r = -0.084$), livestock rearing ($r = 0.003$), tree plantation ($r = -0.073$) and fish cultivation ($r = -0.019$) were not statistically significant to reject the null hypothesis. These findings were similar with the findings of Begum (2001). But correlation coefficient between experience and post-harvest activities ($r = -0.204$) was statistically significant to reject the null hypothesis, indicating better the farming experience higher the contribution of women in post harvest activities. Miah and Halim(1994) also found similar results in their experiment.

Training exposure

Training is one of the process of improving knowledge and skill of an incumbent for doing a specific job. So, it is assumed that women who receive training on homestead agricultural production efficiency, capacity and dynamism are achieved which help them to perform properly the homestead agricultural production of vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation. This consideration led to the null hypothesis of no significant nor direct relationship between the training exposure of women and the amount of contribution in homestead agricultural production of the related items. The correlation coefficient for vegetable cultivation ($r = 0.324$), post-harvest activities ($r = 0.260$), poultry raising ($r = 0.230$), livestock rearing ($r = 0.185$) and fish cultivation ($r = 0.150$) were significant to reject the null hypothesis. But the correlation coefficient of tree-plantation ($r = 0.072$) was not significant to reject the null hypothesis.

These findings indicated that a very few women received training for short period, which could not influence them in utilizing time in a better way for homestead agricultural production of tree plantation. Present finding was not supported by study of Begum (2001), where she found no relationship between training exposure of the women and their contribution in post-harvest activities. But Parven (1995) in a separate study found significant relationship between training exposure and farmers agricultural activities.

Organizational participation

A good number of organizations (GOs and NGOs) has been trying to involve the women into the mainstream of development process. Farming community are likely to involve in different organizations viewing to increase their family income. The intensity of their participation in various organizations were varied. It is assumed that participation in organizations influenced the women in contribution of homestead agricultural production of these selected items. This logic led to the null hypothesis between organizational participation and contribution in homestead agricultural production of these items. The correlation coefficient of vegetable cultivation ($r = 0.544$), post-harvest activities ($r = 0.443$), poultry raising ($r = 0.299$), livestock rearing ($r = 0.297$) and fish cultivation ($r = 0.233$) were significant to reject the null hypothesis. But correlation coefficient value for tree plantation ($r = 0.014$) was not sufficient to reject the null hypothesis. The present findings indicated that women who were involved in organizations, utilized much time in vegetable cultivation, post-harvest activities, poultry raising, livestock rearing and fish cultivation but not in case of tree plantation. Alam (2004) in a separate experiment found that organizational participation of the women had no significant relation with their contribution in agriculture.

Individual extension contact

It is expected that various media under individual extension contact improve the knowledge of women to perform homestead agricultural activities efficiently and utilized their time properly. The coefficient of correlation in case of tree

plantation ($r=0.74$) was statistically significant to reject the null hypothesis. However, individual extension contact had significant positive relationship with contribution of vegetable cultivation ($r=0.531$), post-harvest activities ($r=0.462$), poultry raising ($r=0.313$), livestock rearing ($r=0.368$) and fish cultivation ($r=0.259$) were significant to reject the null hypothesis. Above findings revealed that individual extension contact had immense influence on the contribution of women in all types of homestead agricultural production activities. It is obvious that contact with extension agents and other extension teaching methods changes attitude of clients radically and she becomes interested to adopt new technology which has somewhat been reflected here. But there is utmost need for strengthening extension services to reach the women.

Group extension contact

Generally extension media, specially group extension contact plays an important role to motivate and convince farm operator in adopting improved technology. It is expected that participation of women in different organization helps to get required technical information to perform efficiently the homestead agricultural production of course the extent of their contributions will vary. However, such consideration does not have any signification or direct relationship between group extension contact and the contribution of homestead agricultural production. The coefficient correlation for vegetable cultivation ($r=0.449$), post harvest activities ($r=0.300$), poultry raising ($r=0.339$), livestock rearing ($r=0.277$), and fish cultivation ($r=0.177$) were statistically significant to reject the null hypothesis, indicating the respondents who were more exposed to group extension contact were more involved in homestead agricultural activities and spent much time for vegetable cultivation, post-harvest activities, poultry raising and livestock rearing. The correlation coefficient for tree plantation ($r=0.007$) was not significant to reject the null hypothesis. Perhaps group extension contact could not provide useful information to improve their knowledge and skill on homestead tree plantation.

Mass extension contact

Mass media is generally used to create awareness among the women about various improved farm technologies. Obviously, women get opportunities to know useful information for their required knowledge in utilizing their time economically. This concept was found to have no significant nor direct relationship between mass extension contact of women and the contribution of homestead agricultural production.

The correlation coefficient of vegetable cultivation ($r=0.430$), post-harvest activities ($r=0.295$), poultry raising ($r=0.352$), livestock rearing ($r=0.292$), tree plantation ($r=0.144$) and fish cultivation ($r=0.205$) had significant relationship with the contribution of homestead agricultural production. This finding simply indicated that more the mass extension contact better the contribution in homestead agricultural production. Similar findings were reported by Islam (1994), where he found that mass extension contact of the women had significant relationship with their contribution in different agricultural activities.

Participation in decision making process regarding homestead agricultural production

Agricultural information is usually provided to the farmer with the assumption that the farmers are the key decision makers in respect of farming activities. But with the passage of time many changes have been occurred in the field of agriculture. Women have been involved in various farming activities. They were also involved in homestead agricultural activities. However, in subsistence agricultural economy and traditional society in Bangladesh, farm families are closely bound and interrelated. They support each other in everyday life in a large number of social, productive and economic activities. As because majority of homestead agricultural activities are performed by women, it was expected that it had some influence on length of contribution in homestead vegetable

cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation. This idea led to the null hypothesis of no significant nor direct relationship between the decision making process of women and the contribution of homestead agricultural production. The correlation coefficient between decision making process and the contribution in homestead vegetable cultivation ($r=0.485$), post-harvest activities ($r=0.414$), poultry raising ($r=0.333$), livestock rearing ($r=0.291$) and fish cultivation ($r=0.233$) were statistically significant to reject the null hypothesis indicating that contribution of women in taking decision for homestead agricultural production of the stated items were mostly taken by husband and wife jointly. But the correlation coefficient of tree plantation ($r=0.117$) was not sufficient to reject the null hypothesis indicating that contribution of women in taking decision for tree plantation was mostly taken by wife alone (Table 4.3.1).

Attitude towards homestead agriculture

Attitude is one of the important factors that direct a person to take part in any activity. Women with favourable attitude had more contribution in most of the homestead agricultural production. This consideration led to the null hypothesis of no significant nor direct relationship between attitude toward homestead agriculture and the contribution in homestead agricultural production. However, the correlation coefficient in the case of vegetable cultivation ($r=0.362$), post-harvest activities ($r=0.313$), poultry raising ($r=0.252$), livestock rearing ($r=0.245$), tree plantation ($r=0.215$) and fish cultivation ($r=0.230$) were statistically significant to reject the null hypothesis, indicating that the favourable attitude the more the amount of contribution by women in homestead agricultural production. Present finding was also supported by the study of Naher (2000). She found significant relationship between attitude toward homestead agriculture of women and their participation in homestead agriculture.

Innovativeness of the women

Innovativeness is one of the most important indicators to measure the progressiveness of the women. Generally it is assumed that women with less innovative are likely to use length of time in homestead agricultural activities. This logic led to frame the null hypothesis of no significant nor direct relationship between innovativeness and the contribution in homestead agricultural production of the stated items. The correlation coefficient between innovativeness and length of contribution in homestead vegetable cultivation ($r=0.345$), post harvest activities ($r=0.275$), poultry raising ($r=0.209$), livestock rearing ($r =0.344$), tree plantation ($r=0.146$) and fish cultivation ($r=0.234$) were significant to reject the null hypothesis indicating innovativeness have significant effect on contribution of women in all of the homestead agricultural production. These findings were also similar with the findings of Naher (2000). In her study she found significant relationship between innovativeness of women and their participation in homestead agriculture.

Salient features of correlations and inter-correlations among the independent and dependent variables

The statistical analysis using Pearson's correlation coefficient as shown in Table 4.3.1 are being described below very briefly.

- Out of 96 correlations between sixteen independent and six dependent variables 75 were significant (66 positively and 9 negatively).
- Education, attitude toward homestead agriculture, innovativeness, mass extension contact and farm size shows the highest number of significant correlations (6+6+6+6+6), all of them are positive. Family type, organizational participation, individual extension contact, group

extension contact, decision-making process, annual income and training exposure each of them render five significant correlations. On the other hand age and farming experience had only one significant correlation.

- Among the dependent variables post-harvest activities correlated with 15 independent variables, vegetable cultivation and poultry raising correlated with 14 independent variables, livestock rearing and fish cultivation correlated with 13 independent variables but tree plantation correlated with only 6 independent variables (Table 4.3.2).
- To determine the multi collinierity, the inter-correlation matrix with the independent and among the dependent variables has been presented in the Appendix VI.

Table 4.3.2 Significant correlation between the independent and dependent variables

Sl. No.	Independent variables	Dependent variables					
		Contribution vegetable cultivation	Contribution in post-harvest activities	Contribution in poultry raising	Contribution in livestock rearing	Contribution in tree Plantation	Contribution in fish cultivation
1.	Age	-	-0.229**	-	-	-	-
2.	Education	0.613**	0.554**	0.393**	0.352**	0.209**	0.356**
3.	Physical fitness	-0.187**	-	-0.183**	-	-	-
4.	Family type	-0.426**	-0.380**	-0.206**	-0.238**	-	-0.251**
5.	Family size	0.336**	0.373**	0.175*	0.344**	0.223**	0.310**
6.	Farm size	0.374**	0.323**	0.382**	0.321**	0.312**	0.262**
7.	Annual income	0.377**	0.293**	0.288**	0.247**	-	0.264**
8.	Farming experience	-	-0.204**	-	-	-	-
9.	Training exposure	0.324**	0.260**	0.230**	0.185**	-	0.150*
10.	Organizational participation	0.544**	0.443**	0.299**	0.297**	-	0.233**
11.	Individual extn. contact	0.531**	0.462**	0.313**	0.368**	-	0.259**
12.	Group extn. contact	0.449**	0.300**	0.339**	0.277**	-	0.177*
13.	Mass extn. contact	0.430**	0.295**	0.352**	0.292**	0.144*	0.205**
14.	Decision making process	0.485**	0.414**	0.333**	0.291**	-	0.233**
15.	Attitude toward homestead agricultural activities	0.362**	0.313**	0.252**	0.245**	0.215**	0.230**
16.	Innovativeness	0.345**	0.275**	0.209**	0.344**	0.146*	0.234**

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability

SECTION IV

Contribution of Independent Variables on Dependent Variables

We have already seen in the last section that some selected independent variables had significant co relationships with the six dependent variables; these findings mean that independent variables have some significant contributions with the dependent variables. To measure the amount of contributions multiple regression analysis was done. So, in this study, regression analysis were done using full model and stepwise multiple regression methods separately for six dependent variables.

Contribution of independent variables on the vegetable cultivation of women

Table 4.4.1 Relationship between the selected characteristics of the women and vegetable cultivation in homestead agricultural production

Homestead agricultural activities	Women characteristics	Coefficient of correlation
Vegetable cultivation	Age	-0.120
	Education	0.613**
	Physical fitness	-0.187**
	Family type	-0.426**
	Family size	0.336**
	Farm size	0.374**
	Annual income	0.377**
	Farming experience	-0.066
	Training exposure	0.324**
	Organizational participation	0.544**
	Individual extension contact	0.531**
	Group extension contact	0.449**
	Mass extension contact	0.430**
	Decision making process	0.485**
	Attitude toward homestead agriculture	0.362**
Innovativeness	0.345**	

Out of 14 variables the regression coefficients of only three variables viz. education, physical fitness and training exposure were statistically significant indicating that these variables had significant contribution to the variation in the vegetable cultivation of the women. The other eleven variables had no significant contribution to the same.

Table 4.4.2 Regression coefficients of vegetable cultivation of the women with their selected characteristics in the general linear model procedure

Code	Selected characteristics of the women	Unstandardized coefficients		Standardized coefficients β	t	Significance
		β	Standard error			
	Constant	13.510	3.730		3.622	0.000
X ₂	Education	2.280	0.643	0.554	3.549	0.000
X ₃	Physical fitness	-1.170	0.543	-0.131	-2.154	0.033
X ₅	Family type	0.401	0.897	0.045	0.446	0.656
X ₆	Family size	0.176	0.144	0.110	1.225	0.222
X ₇	Farm size	0.725	0.398	0.123	1.821	0.070
X ₈	Annual income	-0.005	0.016	-0.032	-0.310	0.757
X ₉	Training exposure	-0.945	0.377	-0.204	-2.505	0.013
X ₁₀	Organizational participation	0.181	0.229	0.136	0.789	0.431
X ₁₁	Individual extension contact	0.027	0.190	0.025	0.143	0.886
X ₁₂	Group extension contact	0.059	0.143	0.056	0.416	0.678
X ₁₃	Mass extension contact	-0.130	0.166	0.093	-0.782	0.435
X ₁₄	Participation in decision making process	-0.005	0.012	-0.043	-0.433	0.666
X ₁₅	Attitude toward the homestead agriculture	0.021	0.026	0.088	0.797	0.426
X ₁₆	Innovativeness	0.010	0.072	0.012	0.141	0.888

$$R^2 = 0.437, \text{ Adjusted } R^2 = 0.395, \text{ F. Value} = 10.262$$

The R^2 value was 0.437 and corresponding F value was 10.262, which was significant at 0.000 level. The R^2 value indicating that 43.7 percent of the total variation in the vegetable cultivation of the women was explained by the 3 variables included in the regression analysis. However, it was possible that the proper contribution of the factors could not be expressed because of the inter correlation among the variables.

Therefore, it was decided to run a stepwise multiple regression analysis and the findings are presented in the Table. 4.4.2. It was observed that out of 14 variables, only 3 variables namely education, physical fitness and training exposure were entered into the regression model which combined accounted for 41.3 percent of the total variation in vegetable cultivation of the women. The F value was 45.938, which was significant at 0.000 levels.

Table 4.4.3 Regression coefficients of the selected characteristics of the women with their vegetable cultivation in homestead agricultural production

Selected characteristics of the women	Unstandardized coefficients		Standardized coefficients	t	Significance
	β	Std. error	β		
Constant	16.738	2.456		6.816	0.000
Education	2.981	0.310	0.724	9.606	0.000
Physical fitness	-1.262	0.492	-0.141	-2.567	0.011
Training exposure	-0.816	0.348	-0.176	-2.342	0.020

$$R^2 = 0.413, F = 45.938, P = 0.000$$

In view of the significant contributions of the above mentioned 3 factors to the variation in the vegetable cultivation of the women in homestead agricultural production, researcher rejected the concerned null hypotheses and concluded that each of the above 3 factors had significant effect on ' vegetable cultivation ' of the women. In other words, the vegetable cultivation of the women is influenced by these 3 variables in the following way:

"The women who had more education, more physically fit and more trained were found to have more involvement in vegetable cultivation of the women in the homestead agricultural production".

Education develops mental and psychological ability of a person to understand and decide new ideas and practices. It broadens ones outlook and extends the horizon of knowledge. It also helps women to develops their power of observation and decision making ability. Education enables a woman to use the print media for information on agricultural information, store them for future use and retrieve them when needed. This helps the women to be aware of an innovation relatively early and use sources of information which are technically more accurate. An educated person in general likely to have higher exposure of different information sources and used to come in contact with various extension agents and make frequent contact with other information sources, which make them able to acquire accurate information. It is logical to think that such opportunity make them rich in knowledge about various recommendation of modern vegetable production.

Training exposure had significant contribution to vegetable cultivation of the women. It means that, a person having more training experienced will have more skill in vegetable cultivation. Training involves exchange of views and ideas of the women. Training helps to increase the level of knowledge develops skill and change attitude of an individual.

The unique contribution of each 3 variables was also determined by taking the changes in R^2 value occurred for entry of a particular variable in the step-wise regression model. The results are shown in Table. 4.4.4. The three variables together could explain 41.3 percent of the total variation in the vegetable cultivation of the women and the rest 58.7 percent remain unexplained. Education alone contributed 37.6 percent of the variation followed by physical fitness 2.1 percent and training exposure only 1.6 percent of the variation in vegetable cultivation of the women.

Table 4.4.4 Changes in multiple R^2 for enter of a variable into the stepwise multiple regression models for vegetable cultivation in homestead agricultural production

Model	Variables	R^2	R^2 Change	Variance Explaining (percent)	Significance level
1	Education	0.376	0.376	37.6	0.000
2	Physical fitness	0.397	0.021	2.1	0.010
3	Training exposure	0.413	0.016	1.6	0.020

Contribution of independent variables on the post-harvest activities of the women

Table 4.4.5 Relationship between selected characteristics and post-harvest activities of the women in homestead agricultural production

Homestead agricultural activities	Women characteristics	Co-efficient of correlation
Post-harvest activities	Age	-0.229*
	Education	0.544**
	Physical fitness	-0.027
	Family type	-0.380**
	Family size	0.373**
	Farm size	0.323**
	Annual income	0.293**
	Farming experience	-0.204**
	Training exposure	0.260**
	Organizational participation	0.443**
	Individual extension contact	0.462**
	Group extension contact	0.300**
	Mass extension contact	0.295**
	Decision making process	0.414**
	Attitude toward homestead agriculture	0.313**
Innovativeness	0.275**	

Out of 15 variables the regression co-efficient of only 5 variables viz. education, organizational participation, individual extension contact, family size and

training exposure were statistically significant indicating that these variables had significant contribution to the variation in the post-harvest activities of the women. The other 10 variables had no significant contribution to the same.

Table 4.4.6 Regression coefficients of post-harvest activities of the women with their selected characteristics in the general linear model procedure

Code	Selected characteristics of the women	Unstandardized coefficients	Standardized coefficients B	t	Significance
	Constant	4.981	4.203	1.185	0.238
X ₁	Age	0.016	0.097	0.165	0.869
X ₂	Education	4.438	0.856	5.183	0.000
X ₄	Family type	0.870	1.194	0.729	0.467
X ₅	Family size	0.417	0.189	2.207	0.029
X ₆	Farm size	0.931	0.530	1.758	0.086
X ₇	Annual income	-0.001	0.021	-0.035	0.972
X ₈	Farming experience	-0.093	0.106	-0.878	0.381
X ₉	Training exposure	-1.799	0.504	-3.569	0.000
X ₁₀	Organizational participation	-0.612	0.304	-2.015	0.045
X ₁₁	Individual extension contact	0.876	0.250	3.508	0.001
X ₁₂	Group extension contact	-0.258	0.187	-1.379	0.170
X ₁₃	Mass extension contact	-0.400	0.223	-1.796	0.074
X ₁₄	Decision making process	-0.016	0.015	-1.015	0.311
X ₁₅	Attitude towards homestead agriculture	0.029	0.035	0.826	0.410
X ₁₆	Innovativeness	-0.169	0.099	-1.708	0.089

$$R^2 = 0.439, \text{ Adjusted } R^2 = 0.393, \text{ F Value} = 9.599$$

The R^2 value was 0.439 and corresponding F value was 9.599, which was significant at 0.000 level. The R^2 value indicating that 43.9 percent of the total variation in the post-harvest activities of the women was explained by the 5 variables included in the regression analysis. However, it was possible that the

proper contribution of the factors could not be expressed because of the inter correlation among the variables.

Therefore, it was decided to run a stepwise multiple regression analysis and the findings are presented in the Table 4.4.7. It was observed that out of 5 variables only 3 variables namely education, family size and training exposure were entered into the regression model which combined accounted for 34.8 percent of the total variation in post-harvest activities.

Table 4.4.7 Regression coefficients of the selected characteristics of the women with their post-harvest activities in homestead agricultural production

Characteristics of women	Unstandardized		Standardized coefficient β	t	Significance
	β	Standard error			
Constant	7.040	0.776		9.073	0.000
Education	3.543	0.455	0.650	7.788	0.000
Training	-1.591	0.496	-0.260	-3.210	0.002
Family size	0.317	0.148	0.150	2.145	0.033

$$R^2 = 0.348, \text{ Adjusted } R^2 = 0.338, \text{ F value} = 34.928$$

In view of the significant contribution of the above mentioned 3 factors to the variation in post-harvest activities of the women in homestead agricultural production, the researcher rejected the concerned null hypotheses and concluded that each of the three factors had significant effect on “post-harvest activities’ of the women. In other words, the post-harvest activities of the women is influenced by these three variables in the following way:

“The women who had more education and more training experience and had high family size to have more contribution in post-harvest activities of homestead agricultural production”.

The unique contributions of each of 3 variables was also determined by taking the changes in R^2 value occurred for entry of a particular variable in the stepwise regression model. The results shows in Table 4.4.8. Three variables together could

explain 34.8 percent of the total variation in the post-harvest activities of the women and remaining 65.2 percent was unexplained. Education alone contributed 30.6 percent followed by training exposure 2.7 percent and family size contributed 1.5 percent of the variation in post-harvest activities of the women.

Table 4.4.8 Changes in multiple R^2 for enter of a variable into the stepwise multiple regression model for post-harvest activities in homestead agricultural production

Model	Variables	R^2	R^2 change	Variance explaining (Percent)	Significance level
1	Education	0.306	0.306	30.6	0.000
2	Training exposure	0.333	0.027	2.7	0.006
3	Family size	0.348	0.015	1.5	0.033

Contribution of independent variables on poultry raising of women in homestead agricultural production

Table 4.4.9 Relationship between selected characteristics and poultry raising of the women in homestead agricultural production

Homestead agricultural activities	Women characteristics	Co-efficient of correlation
Poultry raising	Age	-0.024
	Education	0.393**
	Physical fitness	-0.183**
	Family type	-0.206*
	Family size	0.175*
	Farm size	0.382**
	Annual income	0.288**
	Farming experience	-0.084
	Training exposure	0.230**
	Organizational participation	0.299**
	Individual extension contact	0.313**
	Group extension contact	0.339**
	Mass extension contact	0.352**
	Decision-making process	0.333**
	Attitude toward homestead agriculture	0.252**
Innovativeness	0.209**	

Out of 14 variables the regression coefficients of only three variables viz. education, farm size and physical fitness were statistically significant indicating that these variables had significant contribution to the variation in the poultry raising of the women. The other eleven variables had no significant contribution to the same.

Table 4.4.10 Regression coefficients of poultry raising activities of the women with their selected characteristics in the general linear model procedure

Model		Unstandardized		Standardized	t	Significance
	Constant	11.464	4.347		2.620	0.010
X ₂	Education	1.561	0.754	0.370	2.070	0.040
X ₃	Physical fitness	-1.292	0.637	-0.141	-2.027	0.044
X ₄	Family type	0.951	1.053	0.105	0.904	0.367
X ₅	Family size	0.172	0.168	0.105	1.019	0.310
X ₆	Farm size	1.463	0.467	0.243	3.134	0.002
X ₇	Annual income	-0.017	0.019	0.107	0.904	0.367
X ₉	Training exposure	-0.562	0.443	-0.119	-1.271	0.205
X ₁₀	Organizational participation	-0.181	0.269	-0.132	-0.671	0.503
X ₁₁	Individual extension contact	-0.206	0.223	-0.187	-0.671	0.503
X ₁₂	Group extension contact	0.194	0.167	0.180	1.161	0.247
X ₁₃	Mass extension contact	0.073	0.195	0.052	0.377	0.706
X ₁₄	Decision making process	0.016	0.014	0.137	1.204	0.230
X ₁₅	Attitude towards homestead agriculture	-0.024	0.031	-0.098	-0.779	0.437
X ₁₆	Innovativeness	-0.030	0.085	-0.036	-0.357	0.721

$$R^2 = 0.259, \quad F \text{ value} = 4.628 \quad P = 0.000 \quad \text{Adjusted } R^2 = 0.203$$

The R^2 value was 0.259 and corresponding F value was 4.628, which was significant at 0.000 level. The R^2 value indicating that 25.9 percent of the total variation in the poultry raising of the women was explained by the three variables included in the regression analysis. However, it was possible that the proper contribution of the factors could not be expressed because of the inter correlation among the variables.

Therefore, it was decided to run a stepwise multiple regression analysis and the findings are presented in the Table. 4.4.10. It was observed that out of 14 variables, only 3 variables namely education, farm size and physical fitness were entered into the regression model which combined accounted for 22.6 percent of the total variation in poultry raising of the women. The F value was 19.09, which was significant at 0.000 levels.

Table 4.4.11 Regression coefficients of the selected characteristics of the women with their poultry raising in homestead agricultural production

Selected characteristics of the women	Unstandardized coefficients		Standardized coefficients β	t	Significance
	β	Standard error			
Constant	15.847	2.985		5.309	0.000
Education	1.121	0.301	0.266	3.725	0.000
Farm size	1.486	0.430	0.247	3.455	0.001
Physical fitness	-1.362	0.577	-0.149	-2.359	0.019

$$R^2 = 0.226 \quad \text{Adjusted } R^2 = 0.214, \quad F \text{ value} = 19.09, \quad P = 0.000$$

In view of the significant contributions of the above mentioned three factors to the variation in the poultry raising of the women in homestead agricultural production, the researcher rejected the concerned null hypotheses and concluded that each of the above 3 factors had significant effect on 'poultry raising of the women. In other words, the poultry raising of the women is influenced by these three variables in the following way:

"The women, who had more education, more physically fit and large farm size were found to have more poultry raising in the homestead agricultural production".

The unique contribution of each three variables was also determined by taking the changes in R^2 value occurred for entry of a particular variable in the stepwise regression model. The results are shown in Table 4.4.12. The three variables together could explain 22.6 percent of the total variation in the poultry raising of the women and the rest 77.4 percent remain unexplained. Education

alone contributed 15.5 percent of the variation followed by farm size 4.9 percent and physical fitness only 2.2 percent of the variation in poultry raising to the women.

Table 4.4.12 Changes in multiple R^2 for enter of a variable into the stepwise multiple regression model for poultry raising of homestead agricultural production

Model	Variables	R^2	R^2 change	Variance explaining (percent)	Significance level
1	Education	0.155	0.155	15.5	0.000
2	Farm size	0.204	0.049	4.9	0.001
3	Physical fitness	0.226	0.022	2.2	0.019

Contribution of independent variables on the livestock rearing of women in homestead agricultural production

Table 4.4.13 Relationship between the selected characteristics and livestock rearing of the women in homestead agricultural production

Homestead agricultural activities	Women characteristics	Co-efficient of correlation
Livestock rearing	Age	-0.026
	Education	0.352**
	Physical fitness	-0.047
	Family type	-0.238**
	Family size	0.344**
	Farm size	0.321**
	Annual income	0.247**
	Farming experience	0.003
	Training exposure	0.185**
	Organizational participation	0.297**
	Individual extension contact	0.368**
	Group extension contact	0.277**
	Mass extension contact	0.292**
	Decision-making process	0.291**
	Attitude toward homestead agriculture	0.245**
Innovativeness	0.344**	

Out of thirteen variables the regression coefficients of only three variables viz. individual extension contact, family size and farm size were statistically significant indicating that these variables had significant contribution to the variation in the livestock rearing of the women. The other ten variables had no significant contribution to the same.

Table 4.4.14 Regression coefficients of livestock rearing of the women with their selected characteristics in the general linear model procedure

Code	Selected characteristics of the women	Unstandardized		Standardized coefficients β	t	Significance
		β	Standard error			
	Constant	-5.196	4.489		-1.157	0.249
X ₂	Education	0.705	1.082	0.144	0.651	0.516
X ₅	Family type	2.543	1.512	0.191	1.682	0.094
X ₆	Family size	0.818	0.240	0.344	3.415	0.001
X ₇	Farm size	1.991	0.671	0.226	2.969	0.003
X ₈	Annual income	0.013	0.027	0.056	0.480	0.631
X ₉	Training exposure	-1.083	0.635	-0.156	-1.706	0.090
X ₁₀	Organizational participation	-0.309	0.385	-0.155	-0.803	0.423
X ₁₁	Individual extension contact	0.623	0.317	0.385	1.962	0.051
X ₁₂	Group extension contact	-0.074	0.237	-0.047	-0.311	0.756
X ₁₃	Mass extension contact	-0.151	0.279	-0.073	-0.541	0.589
X ₁₄	Decision making process	0.014	0.020	0.079	0.705	0.482
X ₁₅	Attitude towards homestead agriculture	-0.054	0.044	-0.152	-1.224	0.223
X ₁₆	Innovativeness	0.228	0.122	0.183	1.866	0.064

$$R^2 = 0.281, \text{ Adjusted } R^2 = 0.230, F \text{ value} = 5.578, P = 0.000$$

The R^2 value was 0.281 and corresponding F value was 5.573, which was significant at 0.000 level. The R^2 value indicate that 28.1 percent of the total variation in the livestock rearing of the women was explained by the three

variables included in the regression analysis. However, it was possible that the proper contribution of the factors could not be expressed because of the inter correlation among the variables.

Therefore, it was decided to run a stepwise multiple regression analysis and the findings are presented in the Tale 4.4.15. It was observed that out of 13 variables, only three variables namely, individual extension contact, family size and farm size were entered in to the regression model which combined accounted for 22.1 percent of the total variation in livestock rearing of the women. The F value was 18.559, which was significant at 0.000 level.

Table 4.4.15 Regression coefficients of the selected characteristics of the women with their livestock rearing in homestead agricultural production

Selected characteristics of the women	Unstandardized coefficients		Standardized coefficients β	t	Significance
	β	Standard error			
Constant	3.916	1.341		2.920	0.004
Individual extension contact	0.335	0.116	0.207	2.873	0.005
Family size	0.549	0.162	0.230	3.384	0.001
Farm size	1.805	0.596	0.205	3.029	0.003

$$R^2 = 0.221 \quad \text{Adjusted } R^2 = 0.209, \quad F \text{ value} = 18.559$$

In view of the significant contributions of the above mentioned 3 factors to the variation in the livestock rearing of the women the researcher rejected the concerned null hypotheses and concluded that each of the above 3 factors had significant effect on 'livestock rearing' of the women. In other words, the livestock rearing of the women is influenced by these 3 variables in the following way:

“The women who had more individual extension contact, large family size and large farm size were found to have more involved in livestock rearing in the homestead agricultural production.”

The unique contribution of each of 3 variables was also determined by taking the changes in R^2 value occurred for entry of a particular variable in the stepwise regression model. The results are shown in Table. 4.4.16.

The 3 variables together could explain 22.1 percent of the total variation in the livestock rearing of the women and the rest 77.9 percent remain unexplained. Individual extension contact alone contributed 13.6 percent of the variation followed by family size 4.9 percent and farm size only 3.6 percent of the variation in livestock rearing of the women.

Table 4.4.16 Changes in multiple R^2 for enter of a variable into the stepwise multiple regression models for livestock rearing in homestead agricultural production

Model	Variables	R^2	R^2 change	Variance explaining (percent)	Significance level
1	Individual extension contact	0.136	0.136	13.6	0.000
2	Family size	0.185	0.049	4.9	0.001
3	Farm size	0.221	0.036	3.6	0.003

Contribution of independent variables on the tree plantation of women in homestead agricultural production

Table 4.4.17 Relationship between the selected characteristics of the women and tree plantation in homestead agricultural production

Homestead agricultural activities	Women Characteristics	Coefficient of correlation (r)
Tree plantation	Age	-0.098
	Education	0.209**
	Physical fitness	-0.061
	Family type	-0.018
	Family size	0.223**
	Farm size	0.312**
	Annual income	0.123
	Farming experience	-0.073
	Training exposure	0.072
	Organizational participation	0.014
	Individual extension contact	0.074
	Group extension contact	0.007
	Mass extension contact	0.144*
	Decision making process	0.117
	Attitude toward homestead agriculture	0.215**
	Innovativeness	0.146*

Out of 6 variables the regression coefficients of only two variables viz. farm size and family size were statistically significant indicating that these variables had significant contribution to the variation in the tree plantation of the women. The other four variables had no significant contribution to the same.

Table 4.4.18 Regression coefficients of tree plantation of the women with their selected characteristics in the general linear model procedure

Code	Selected characteristics of the women	Unstandardized coefficients		Standardized coefficients β	t	Significance
		β	Standard error			
	Constant	6.001	1.235		4.857	0.000
X ₂	Education	-0.080	0.483	-0.018	-0.165	0.869
X ₅	Family size	0.335	0.144	0.191	2.327	0.021
X ₆	Farm size	1.838	0.513	0.283	3.581	0.000
X ₁₂	Group extension contact	-0.095	0.139	-0.062	-0.683	0.496
X ₁₅	Attitude toward homestead agriculture	0.030	0.026	0.116	1.182	0.239
X ₁₆	Innovativeness	-0.050	0.088	-0.055	-0.571	0.568

$$R^2 = 0.135 \quad \text{Adjusted } R^2 = 0.108, \quad F \text{ value} = 5.019$$

The R^2 value was 0.135 and corresponding F value was 5.019, which was significant at 0.000 levels. The R^2 value indicating that 13.5 percent of the total variations in the tree plantation of the women was explained by the two variables included in the regression analysis. However, it was possible that the proper contribution of the factors could not be expressed because of the inter correlation among the variables.

Therefore, it was decided to run a stepwise multiple regression analysis and the findings are presented in the Table. 4.4.19. It was observed that out of 6 variables, only two variables namely, farm size and family size were entered into the regression model which combined accounted for 12.6 percent of the total variation in tree plantation of the women. The F value was 14.241, which was significant at 0.000 levels.

Table 4.4.19 Regression coefficients of the selected characteristics of the women with their tree plantation in homestead agricultural production

Selected characteristics of the women	Unstandardized coefficients		Standardized coefficients β	t	Significance
	β	Standard error			
Constant	6.741	1.037		6.500	0.000
Farm size	1.825	0.439	0.281	4.159	0.000
Family size	0.305	0.119	0.174	2.569	0.011

$$R^2 = 0.126 \quad \text{Adjusted } R^2 = 0.117, \quad F \text{ value} = 14.241$$

In view of the significant contributions of the above mentioned two factors to the variation in the tree plantation of the women, the researcher rejected the concerned null hypotheses and concluded that each of the above 2 factors had significant effect on tree plantation of the women. In other words, the tree plantation of the women is influenced by these 2 variables in the following way:

“The women who had large farm size and large family size were found to have more tree plantation in homestead agricultural production.”

The unique contributions of each 2 variables were also determined by taking the changes in R^2 value occurred for entry of a particular variable in the stepwise regression model. The results are shown in Table 4.4.20. The 2 variables together could explain 12.6 percent of the total variation in the tree plantation of the women and the rest 87.4 percent remain unexplained. Farm size alone contribute 9.7 percent and family size only 2.9 percent of the variation in tree plantation of the women.

Table 4.4.20 Changes in multiple R^2 for enter of a variable into the stepwise multiple regression models for tree plantation in homestead agricultural production

Model	Variables	R^2	R^2 change	Variance explaining (percent)	Significance level
1	Farm size	0.097	0.097	9.7	0.000
2	Family size	0.126	0.029	2.9	0.011

Contribution of independent variables on the fish cultivation of women in homestead agricultural production

Table 4.4.21 Relationship between the selected characteristics of the women and fish cultivation in homestead agricultural production

Homestead agricultural activities	Women characteristics	Coefficient of correlation (r)
Fish cultivation	Age	-0.081
	Education	0.356**
	Physical fitness	0.068
	Family type	-0.251**
	Family size	0.310**
	Farm size	0.262**
	Annual income	0.264**
	Farming experience	0.019
	Training exposure	0.150*
	Organizational participation	0.233**
	Individual extension contact	0.259**
	Group extension contact	0.177*
	Mass extension contact	0.205**
	Decision making process	0.233**
Attitude toward homestead agriculture	0.230**	
Innovativeness	0.234**	

Out of thirteen variables the regression coefficients of only five variables viz. education, organizational participation, family size, training exposure and annual income were statistically significant indicating that these variables had significant contribution to the variation in the fish cultivation of the women. The other 8 variables had no significant contribution to the same. The R^2 value was .239 and corresponding F value was 4.491, which was significant at 0.000 levels. The R^2 value indicating that 23.9 percent of the total variations in the fish cultivation of the women was explained by the 5 variables included in the regression analysis. However, it was possible that the proper contribution of the factors could not be expressed because of the intercorrelation among the variables.

Table 4.4.22 Regression coefficients of fish cultivation of the women with their selected characteristics in the general linear model procedure

Code	Selected characteristics of the women	Unstandardized coefficients		Standardized coefficients β	t	Significance
		β	St. error			
	Constant	6.250	3.008		2.078	0.039
X ₂	Education	2.604	0.725	0.649	3.591	0.000
X ₄	Family type	0.835	1.013	0.096	0.825	0.411
X ₅	Family size	0.430	0.160	0.278	0.2683	0.008
X ₆	Farm size	0.758	0.449	0.132	1.687	0.093
X ₇	Annual income	0.036	0.018	0.235	1.966	0.51
X ₉	Training exposure	-1.111	0.425	-0.246	-2.613	0.010
X ₁₀	Organizational Participation	-0.514	0.258	-0.396	-1.994	0.048
X ₁₁	Individual extension contact	0.366	0.213	0.347	1.720	0.087
X ₁₂	Group extension contact	-0.100	0.159	-0.097	-0.626	0.532
X ₁₃	Mass extension contact	-0.165	0.187	-0.122	-0.883	0.378
X ₁₄	Decision making process	-0.014	0.013	-0.125	-1.089	0.277
X ₁₅	Attitude towards homestead agriculture	-0.025	0.030	-0.108	-0.845	0.399
X ₁₆	Innovativeness	-0.058	0.082	-0.072	-0.714	0.476

$$R^2 = 0.239 \quad \text{Adjusted } R^2 = 0.186, \quad F \text{ value} = 4.491$$

Therefore, it was decided to run a stepwise multiple regression analysis and the findings are presented in the Table. 4.4.23. It was observed that out of 5 variables only 3 variables namely, education, family size and training exposure were entered in the regression model which combined accounted for 17.2 percent of the total variation in fish cultivation of the women. The F value was 13.574, which was significant at 0.000 level.

Table 4.4.23 Regression coefficients of the selected characteristics of the women with their fish cultivation in homestead agricultural production

Selected characteristics of the women	Un standardized coefficients		Standardized coefficients β	t	Significance
	β	Standard error			
Constant	8.752	0.644		13.598	0.000
Education	1.602	0.377	0.399	4.245	0.000
Farm size	0.319	0.122	0.205	2.601	0.010
Training exposure	-1.017	0.411	-0.225	-2.473	0.014

$$R^2 = 0.172 \quad \text{Adjusted } R^2 = 0.159, \quad F \text{ value} = 13.574$$

In view of the significant contributions of the above mentioned 3 factors to the variation in the fish cultivation of the women in homestead agricultural production, the researcher rejected the concerned null hypotheses and concluded that each of the above 3 factors had significant effect on fish cultivation` of the women. In other worlds, the fish cultivation of the women is influenced by these 3 variables in the following way:

“The women who had more education, large family size, more training exposure were found to more involve in fish cultivation in the homestead agricultural production”.

The unique contribution of each of 3 variables was also determined by taking the changes in R^2 value occurred for entry of a particular variable in the stepwise regression model. The results are shown in Table 4.4.24.

Table 4.4.24 Changes in multiple R^2 for enter of a variable into the stepwise multiple regression model for fish cultivation in homestead agricultural production

Model	Variables	R^2	R^2 change	Variance explaining (percent)	Significance level
1	Education	0.127	0.127	12.7	0.000
2	Family size	0.146	0.019	1.9	0.036
3	Training	0.172	0.026	2.6	0.014

The 3 variables together could explain 17.2 percent of the total variation in the fish cultivation of the women and the rest 82.8 percent remain unexplained. Education alone contributed 12.7 percent of the variation followed by family size 1.9 percent and training exposure contributed 2.6 percent of the variation in fish cultivation of the women.

SECTION V

Path coefficient analysis

Path coefficient is a standardized partial regression coefficient analysis. The objectives of doing path analysis were to measure the direct and indirect effects of one variable upon another and allow the separations of correlation coefficients into components of direct and indirect effects. It is very important in identifying the causal factors and their effects on dependent variables (Dewey and Lu. 1959).

Path analysis for measuring direct and indirect effects of selected independent variables of the women on vegetable cultivation

In the present study, 'path analysis' was done to give clear understanding of direct effects of 3 variables, which were entered into the stepwise regression model on the vegetable cultivation of the women. Variables through which substantial indirect effects were channeled were also explored. The 'path coefficient' of selected independent variables of women with respect to vegetable cultivation are shown in Table 4.5.1.

Table 4.5.1 Path coefficients showing the direct and indirect effects of selected independent variables of the women on vegetable cultivation

Independent variables	Direct effect	Total indirect effect	Variables through which substantial indirect effects of are channeled	
			Value	Variables
Education	0.724	-0.11069	0.00987	Physical fitness
			-0.12056	Training exposure
Physical fitness	-0.141	-0.045928	-0.05068	Education
			0.004752	Training
Training exposure	-0.176	0.499747	0.49594	Education
			0.003807	Physical fitness

Education

The direct effect of education on vegetable cultivation by the women was substantial and positive (0.724). The indirect effect of education was also substantial and negative (-0.11069). The indirect effect was channeled through mainly training exposure (-0.12056). Therefore, it may be inferred that other variables, remaining constant, education appears to have substantial positive influence on the vegetable cultivation by the women.

Physical fitness

The direct effect of physical fitness on the vegetable cultivation by the women was substantial and negative (-0.141). It has small negative indirect effect (-0.045928) as well. Therefore, it may be inferred that other variable remaining constant, physical fitness appears to have substantial negative influence on the vegetable cultivation of the women

Training exposure

The direct effect of training exposure on vegetable cultivation by the women was substantial and negative (-0.176). The indirect effect was also substantial and positive (0.499) which was channeled through mainly education (0.49594). Therefore, it may be inferred that other variables remaining constant, training exposure appears to have substantial influence on the vegetable cultivation of the women.

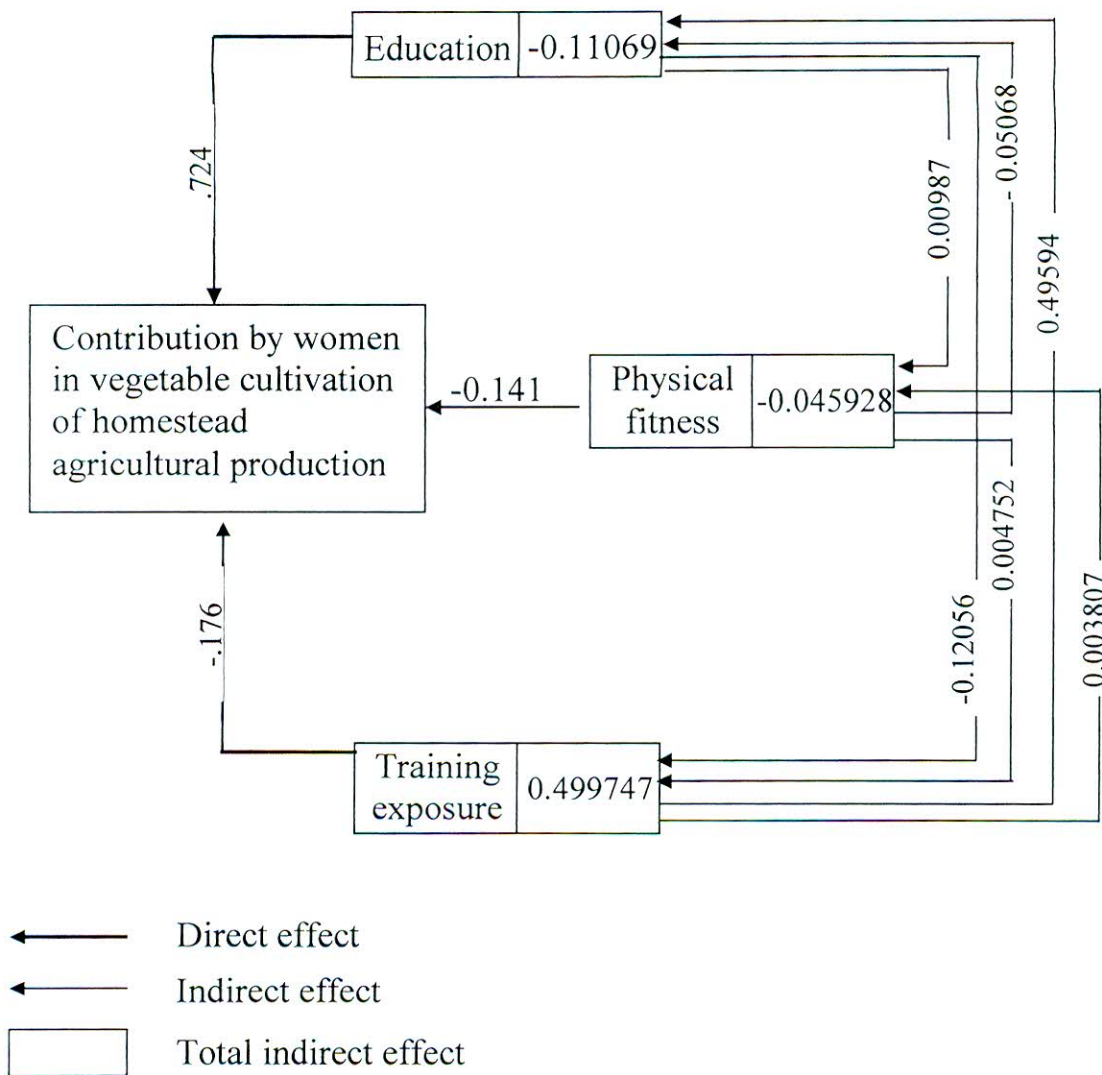


Figure 4.11 Path diagram showing direct and indirect effects of selected characteristics of women on their contribution of vegetable cultivation

Path analysis for measuring direct and indirect effects of selected independent variables of the women on post-harvest activities

Procedure for measuring direct and indirect effects of selected independent variables on post-harvest activities of the women has already been discussed earlier. This also holds good for post-harvest activities of the women. The results of this measurement are shown in Table 4.5.2.

Table 4.5.2 Path coefficients showing the direct and indirect effects of selected independent variables of the women on post-harvest activities

Independent variables	Direct effect	Total indirect effect	Variables through which substantial indirect effects of are channeled	
			Value	Variables
Education	0.650	-0.09695	-0.1781	Training
			0.08115	Family size
Training exposure	-0.260	0.51965	0.44525	Education
			0.0744	Family size
Family size	0.150	0.22269	0.35165	Education
			-0.12896	Training

Education

The direct effect of education on post-harvest activities of the women was substantial and positive (0.650). The indirect effect was not substantial (-0.09695), which was channeled mainly through training exposure (-0.1781). Therefore, it may be inferred that other variable, remaining constant, education appears to have substantial positive influence on the post-harvest activities of the women.

Training exposure

The direct effect (-0.260) of training exposure, which was substantial. The indirect effect (0.51965) was also substantial which was channeled through education (0.44525). Therefore, it may be inferred that other variables, remaining constant, training exposure appears to have substantial influence on the post-harvest activities of the women.

Family size

The direct effect of family size on post-harvest activities of the women was substantial and positive (0.150). The indirect effect was also substantial (0.22269), which was channeled through education (0.35165) and training exposure (-0.12896). Therefore, it may be inferred that other variables remaining constant, family size appears to have substantial positive influence on post-harvest activities of the women.

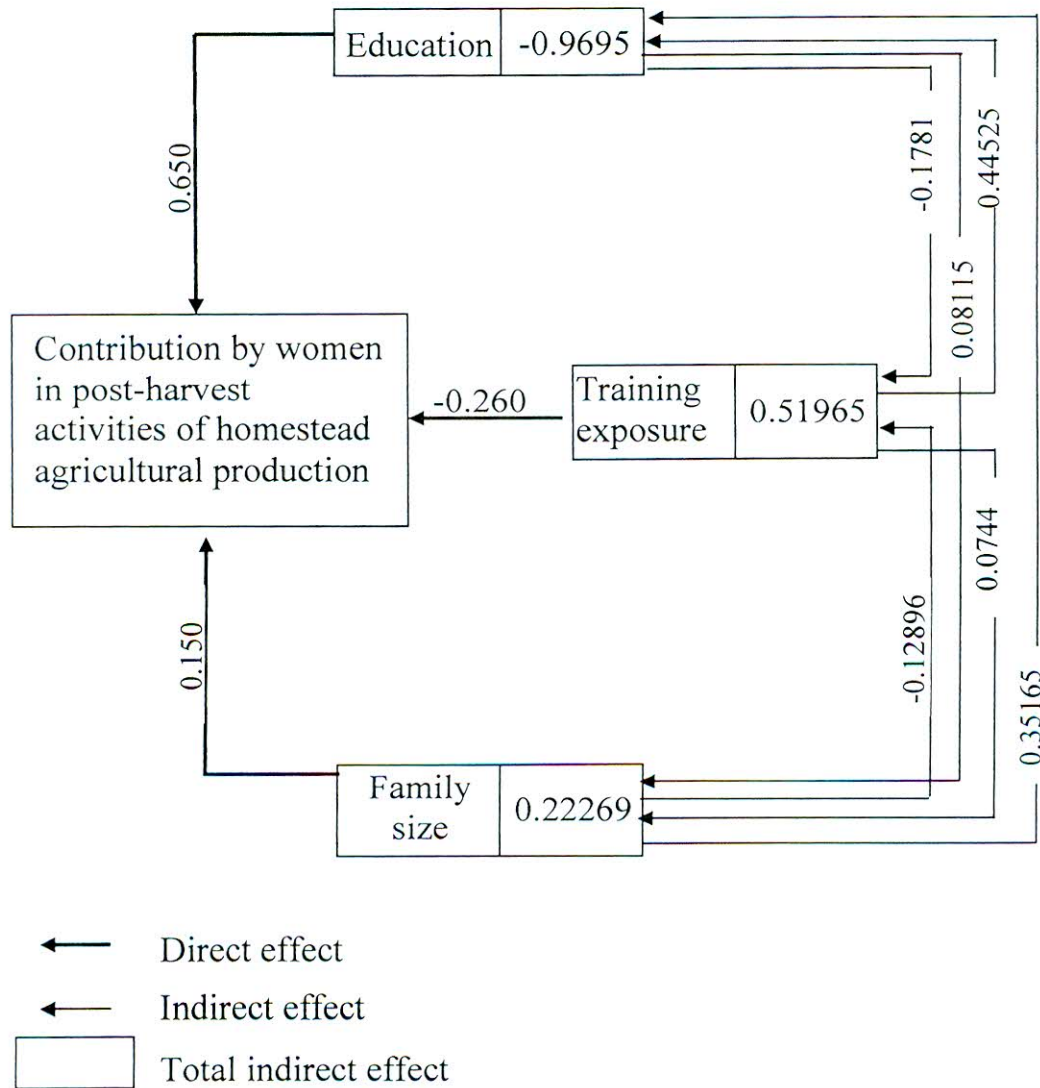


Figure 4.12 Path diagram showing direct and indirect effects of selected characteristics of women on their contribution of post-harvest activities

Path analysis for measuring direct and indirect effects of selected independent variables of the women on poultry raising

The same path analysis procedure was followed here as was done in case of vegetable cultivation.

In the present study, path analysis was done to give clear understanding of direct effects of 3 variables which were entered into the stepwise regression model on the poultry raising of the women. Variables through which substantial indirect effects were channeled were also explored. The path coefficient' of selected independent variables of women with respect to poultry raising are shown in Table 4.5.3.

Table 4.5.3 Path coefficients showing the direct and indirect effects of selected independent variables of the women on poultry raising

Independent variables	Direct effect	Total indirect effect	Variables through which substantial indirect effects of are channeled	
			Value	Variables
Education	0.266	0.127508	0.117078	Farm size
			0.01043	Physical fitness
Farm size	0.247	-0.135324	0.126084	Education
			0.009238	Physical fitness
Physical fitness	-0.149	-0.033934	-0.01862	Education
			-0.015314	Farm size

Education

The direct effect of education was substantial (0.266). The indirect effect was substantial (0.127508) which was channeled mainly through farm size (0.117078). Therefore, it may be inferred that other variables remaining constant education appears to have substantial positive influence on poultry raising by the women in homestead agricultural production.

Farm size

Farm size had direct substantial effect (0.247) on the poultry raising. The indirect effect was (-0.135324) channeled mainly through education (0.126084). Therefore, it may be inferred that other variables remaining constant, farm size appears to have substantial positive influence on the poultry raising by the women in homestead agricultural production.

Physical fitness

The direct effect (-0.149) was substantial and negative. The indirect effect was the small (-0.033). Therefore, it may be inferred that other variables remaining constant, physical fitness appears to have substantial negative influence on the poultry raising by the women in homestead agricultural production.

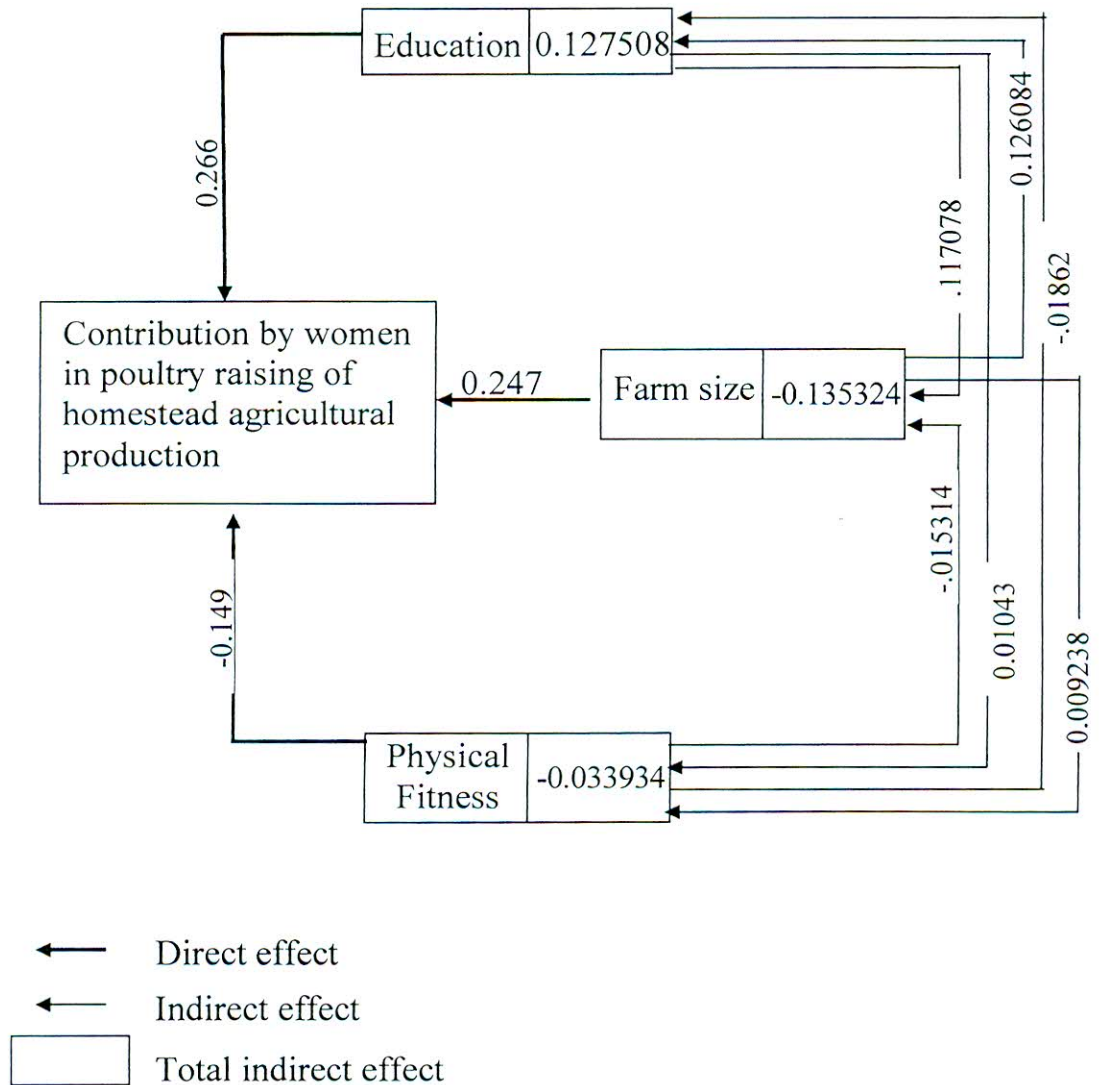


Figure 4.13 Path diagram showing direct and indirect effects of selected characteristics of women on their contribution of poultry raising

Path analysis for measuring direct and indirect effects of selected independent variables of the women on livestock rearing

The same path analysis procedure was followed here as was done in case of vegetable cultivation.

In the present study, path analysis was done to give clear understanding of direct effects of 3 variables, which were entered into the stepwise regression model on the livestock rearing by the women. Variables through which substantial indirect effects were channeled were also explored. The path coefficients of selected independent variables of women with respect to livestock rearing are shown in Table 4.5.4.

Table 4.5.4 Path coefficients showing the direct and indirect effects of selected independent variables of the women on livestock rearing

Independent variables	Direct effect	Total indirect effect	Variables through which substantial indirect effects of are channeled	
			Value	Variables
Individual extension contact	0.207	0.1611	0.08648	Family size
			0.07462	Farm size
Family size	0.230	0.113502	0.077832	Individual extension contact
			0.03567	Farm size
Farm size	0.205	0.115368	0.075348	Individual extension contact
			0.04002	Family size

Individual extension contact

The direct effect of individual extension contact on the livestock rearing by the women was substantial (.207). The indirect effect was also substantial (.1611). Therefore, it may be inferred that other variables remaining constant, individual extension contact appears to have substantial positive influence on the livestock rearing by the women in homestead agricultural production.

Family size

The direct effect of family size on the livestock rearing of the women was substantial (0.230). The indirect effect was also substantial (0.113). Therefore, it may be inferred that other variables remaining constant, family size appears to have substantial positive influence on the livestock rearing of the women in home stead agricultural production.

Farm size

Direct of effect of farm size on the livestock rearing of the women was substantial (0.205). The indirect effect was also substantial (0.115). Therefore, it may be inferred that other variables remaining constant, farm size appears to have substantial positive influence on the livestock rearing of the women in homestead agricultural production.

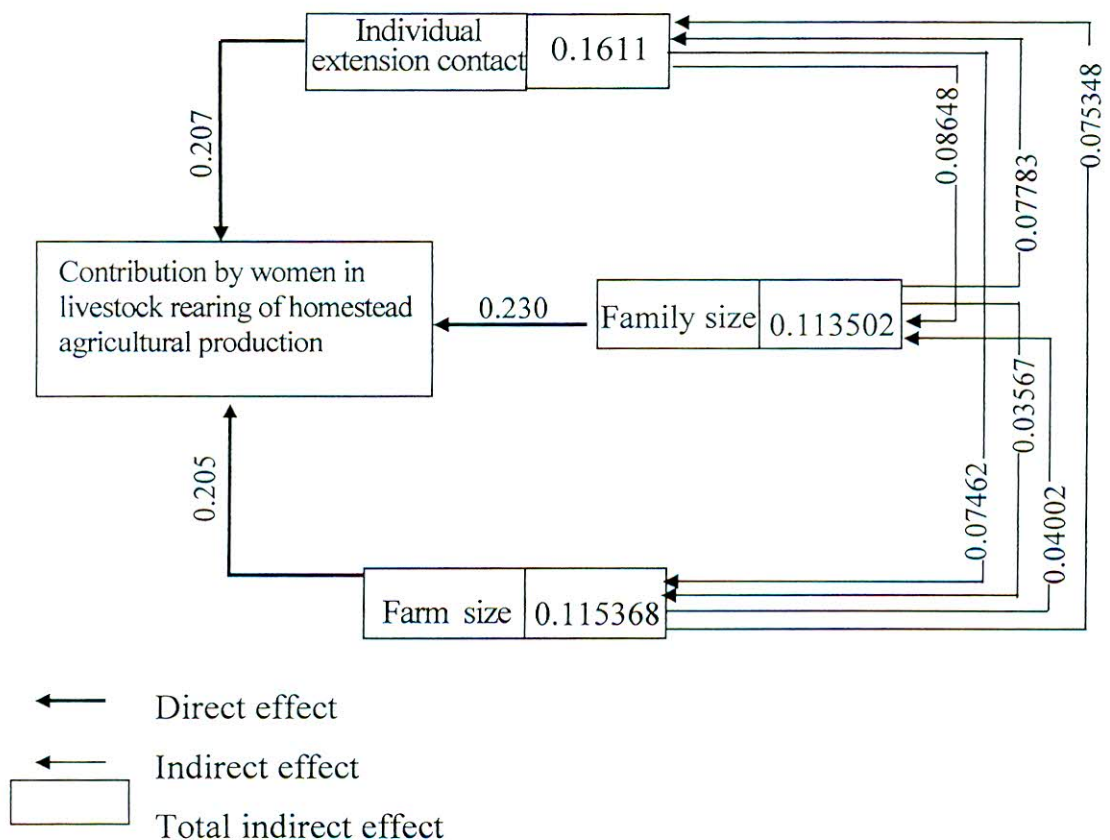


Figure 4.14 Path diagram showing direct and indirect effects of selected characteristics of women on their contribution of livestock rearing

Path analysis for measuring direct and indirect effect of selected independent variables of the women on tree plantation

The same path analysis procedure was followed here as was done in case of vegetable cultivation.

The path coefficient of selected independent variables of women with respect to tree plantation are shown in Table 4.5.5.

Table 4.5.5 Path coefficients showing the direct and indirect effects of selected independent variables of the women on tree plantation

Independent variables	Direct effect	Total indirect effect	Variables through which substantial indirect effects of are channeled	
			Value	Variables
Family size	0.281	0.030276	0.030276	Family size
Farm size	0.174	0.048894	0.048894	Farm size

Family size

The direct effect of family size on the tree plantation was substantial (0.281). The indirect effect was not substantial (0.030276), which was channeled through farm size. Therefore, it may be inferred that other variables remaining constant family size appears to have substantial positive influence on the tree plantation of the women of homestead agricultural production.

Farm size

The direct effect was substantial (0.174) and positive. The indirect effect was not substantial (0.0488), which was channeled through farm size. Therefore, it may be inferred that others variables remaining constant farm size appears to have substantial positive influence on tree plantation of the women in homestead agricultural production.

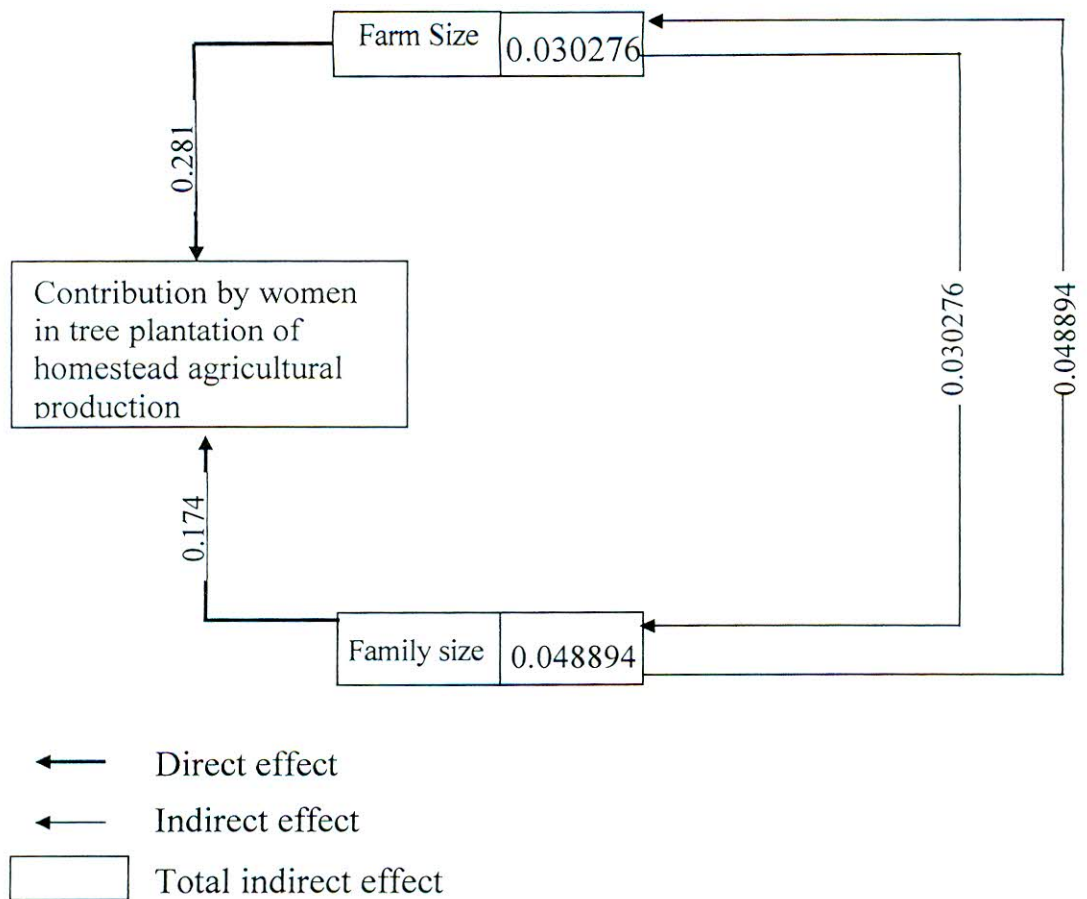


Figure 4.15 Path diagram showing direct and indirect effects of selected characteristics of women on their contribution of tree plantation

Path analysis for measuring direct and indirect effects of selected independent variables of the women on fish cultivation

The same path analysis procedure was followed here as was done in case of vegetable cultivation.

The path coefficients of selected independent variables of women with respect to fish cultivation are shown in Table 4.5.6.

Table 4.5.6 Path coefficients showing the direct and indirect effects of selected independent variables of the women on fish cultivation

Independent variables	Direct effect	Total indirect effect	Variables through which substantial indirect effects are channeled	
			Value	Variables
Education	0.399	-0.04322	0.110905	Family size
			-0.154125	Training exposure
Family size	0.205	0.104259	0.215859	Education
			-0.1116	Training exposure
Training exposure	-0.225	0.374995	0.273315	Education
			0.10168	Family size

Education

The direct effect (0.399) was substantial and positive. The indirect effect (-0.04322) was not substantial, which was channeled through family size and training exposure. Therefore, it may be inferred that other variables remaining constant, education appears to have substantial positive influence on fish cultivation of the women in homestead agricultural production.

Family size

The direct effect of family size on fish cultivation was substantial (0.205). The indirect effect was also substantial (0.104) which was channeled through education and training exposure. Therefore, it may be inferred that other variables remaining constant, family size appears to have substantial influence on fish cultivation of the women of homestead agricultural production.

Training exposure

The direct effect of training exposure (-0.225) was substantial. The indirect effect (0.374) was also substantial, which was channeled through education (0.273) and family size (0.101). Therefore, it may be inferred that other

variables remaining constant training exposure appears to have substantial influence on fish cultivation of homestead agricultural production.

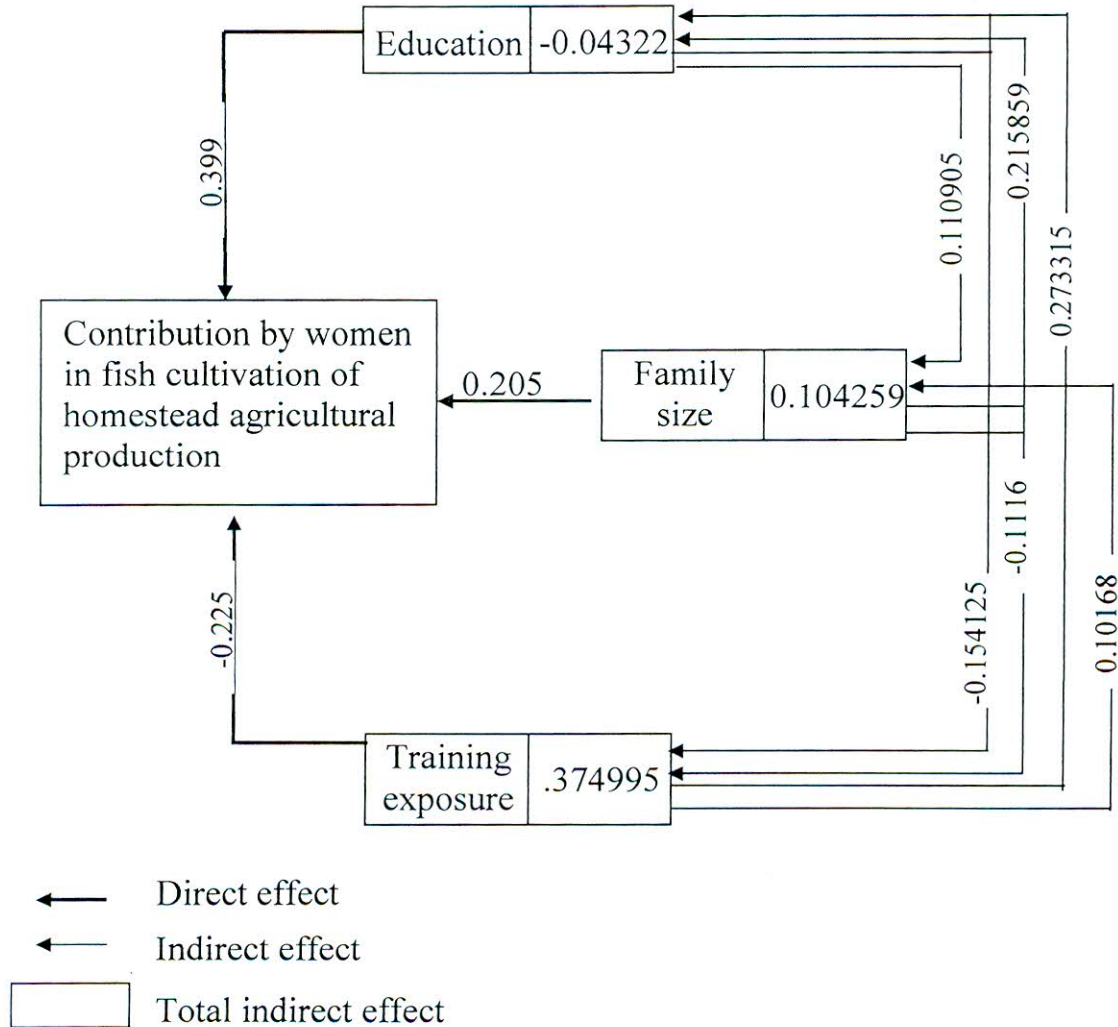


Figure 4.16 Path diagram showing direct and indirect effects of selected characteristics of women on their contribution of fish cultivation

SECTION VI

Constraints faced by the women in performing homestead agricultural production

The constraints mentioned by the women were ranked and presented in Table 4.6.1.

Table 4.6.1 Rank order of the constraints faced by the women in performing homestead agricultural production

Constraints	1 st most important constraint	2 nd most important constraint	3 rd most important constraint	4 th most important constraint	5 th most important constraint	Total	Constraint index	Rank order
Vegetable cultivation :								
Lack of place in homestead area	95	85	70	78	76	404	1257	1
Lack of quality seeds and seedling	45	45	65	45	47	247	737	2
Lack of money for buying seed seedlings, and other materials	32	30	35	25	35	177	470	3
Lack of sufficient water	20	25	12	30	22	109	318	4
Lack of information in time	8	15	18	22	20	83	218	5
Post-harvest activities :								
Un-favorable weather	90	77	80	85	65	397	1233	1
Take more time	40	46	50	45	54	235	578	2
Crop loss during post harvest activities	35	35	35	30	35	170	515	3
High physical labour	25	20	25	28	26	124	362	4
Lack of available place	10	22	10	12	20	74	212	5
Poultry raising :								
Lack of vaccine in time	85	65	82	75	65	373	1146	1
Hybrids are diseased susceptible and die faster	45	52	48	48	70	263	743	2
Lack of knowledge about disease	35	37	37	37	25	171	533	3
Lack of proper supply of feeds	20	24	23	18	38	123	339	4
Low market price	15	22	10	22	12	81	249	5
Livestock rearing :								
Livestock die due to disease	65	75	85	78	55	358	1091	1
Livestock rearing during rainy season	70	48	45	57	75	295	866	2
Lack of hybrid variety	35	35	30	37	38	175	517	3
Lack of facility of breeding	18	20	20	18	20	96	286	4
To create contradiction with neighbour due to damage of homestead garden and field crop by cattle	12	22	20	10	12	76	240	5
Tree plantation :								
Lack of suitable land	85	70	84	88	97	424	1230	1
Fruit setting takes long time that is irritable	65	68	56	64	62	315	955	2
Branchy trees harm the field crops	35	30	34	30	20	149	477	3
Lack of knowledge to apply fertilizers in time	12	22	16	12	18	80	238	4
Low market price	3	10	10	6	3	32	100	5
Fish cultivation :								
Religious sentiment	85	88	82	84	81	420	1272	1
Pond digging is costly	55	56	65	62	72	310	890	2
Lack of marketing facility	25	24	25	28	20	122	372	3
Low market price	20	20	18	16	18	92	284	4
Lack of knowledge to culture different species of fish	15	12	10	10	9	56	182	5

In all, there were 30 constraints mentioned by the women related to homestead area, seed, seedling, finance, disease, insect, pest etc.

In case of vegetable cultivation, it is seen from the table that lack of homestead area ranked first as the most important factor in contribution of homestead agricultural production. For production of homestead vegetables requires sufficient area. So, it was natural for the women to mention “lack of homestead area” as the most important constraint. “Lack of quality seeds and seedling” was the second problem with problem index 737. “Lack of money for buying seed and seedlings” was the third problem. The reason is that maximum women of the study area live on poverty level. The ranking of other problems relating to vegetable cultivation are shown in the Table 4.6.1.

In case of post-harvest activities of different crops mostly depend on weather like wind, sunlight, temperature and moisture. Rainy season is the optimum harvesting period of boro rice. So, favourable weather is the most important factor for these activities. Most of the respondents opined that weather causes a serious constraint to their work. Time consume was the second problem. The ranking of other problems relating to post-harvest activities are shown in the Table 4.6.1.

Most of the respondents have no knowledge about proper time of vaccination. So in case of poultry raising “lack of vaccine in time” was the first problem and “hybrids are disease susceptible and die faster” was the second problem. Other listed problems are shown in Table 4.6.1.

Most of the women have no knowledge about disease of livestock. So, “livestock die due to disease” was the first problem in case of livestock rearing. Majority of the respondents feels that it is a boring job in rainy season. So ‘livestock rearing during rainy season’ was the second problem. Other problems in case of livestock rearing are shown in Table 4.6.1.

In rural areas major portion of homestead area are used for household activities. So lack of suitable land was the first problem in case of tree plantation. Second problem was the ‘fruit setting takes long time that is irritable’ and other problems of tree plantation are shown in Table 4.6.1.

Majority respondents of this study are Muslim women. So, “religious sentiment” for wearing veil was the most important factor in case of fish cultivation. Initial step for fish cultivation requires high amount of money. So “pond digging is costly” was the second problem of fish cultivation. Other listed problems of fish cultivation are shown in Table 4.6.1.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

Introduction

Agriculture is the single largest sector in Asia that contributes to about 30 percent to GDP and absorbs nearly 60 percent of the work forces (Bhattacharya *et al.* 1995). As the economy of Bangladesh is basically agro-based, social and economic development of the country depends on proper mobilization of its population, especially the rural population as that comprises 85 percent of the inhabitants and directly and indirectly depend on agriculture.

Homestead is the centre of all agricultural production activities in rural Bangladesh. Homestead is the dwelling place as well as production with of vegetables, fruits, poultry, livestock and fisheries in an integrated manner.

Women constitute roughly half of world population. In Bangladesh women constitute about 49% of the total population (BBS, 2004). In our subsistent agro based economy, people of both the sex help each other in their daily life in almost all the productive and socio-economic activities. In addition, the women do some productive activities including agricultural and non-agricultural works within the homestead (Halim and McCarthy, 1985). These observations has encouraged and prompted the researcher to conduct the study entitled "Contribution of Women in Homestead Agricultural Production."

The major objectives of the study were to find out the contribution of women in homestead agricultural production. Contribution of women in homestead agricultural production was conceptualized in terms of vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, fish cultivation and tree plantation practice of the women. However, the specific objectives of the study were as follows:

1. To determine the contribution of women in different selected activities of homestead agriculture. The activities are:

- i. Vegetable cultivation
- ii. Post-harvest activities
- iii. Poultry raising
- iv. Livestock rearing
- v. Tree plantation and
- vi. Fish cultivation

2. To determine some selected characteristics of the women. The selected characteristics included the following:

- i. Age
- ii. Education
- iii. Physical fitness
- iv. Family type
- v. Family size
- vi. Farm size
- vii. Annual income
- viii. Farming experience
- ix. Training exposure
- x. Organizational participation
- xi. Individual extension contact
- xii. Group extension contact
- xiii. Mass extension contact
- xiv. Participation in decision making process regarding homestead agriculture
- xv. Attitude toward homestead agriculture
- xvi. Innovativeness

3. To explore relationships and to determine the contributions of the above mentioned 16 selected characteristics of the women with their contribution in

- vegetable cultivation
- post-harvest activities
- poultry raising
- livestock rearing
- tree plantation
- fish cultivation

4. To identify the constraints faced by the women in performing homestead agricultural production.

Methodology

Rajshahi district was selected as the locale of the study. Out of seven upazilas two were randomly selected. Those were Paba and Tanore upazila. Four villages were selected through multistage random sampling, two from each upazila namely Narikelbaria and Khorkhori from Paba upazila and Talanda and Haridebpur from Tanore upazila. On the basis of their land holding in that year women in each sampled village were categorized into marginal, small and medium farmer. Ten percent of the population was randomly selected from each category. Altogether 200 respondents were interviewed.

An interview schedule was used to collect data, which have been shown in English (Appendix II). But questions were made in Bangla for the respondents by the researcher herself during pretest and final data collection. Final data were collected from November 2005 to January 2006. The interview schedule comprised a number of simple and direct questions, which were placed systematically. Sixteen independent and six dependent variables were selected in this study, which included the following:

Independent variables

- i. Age
- ii. Education
- iii. Physical fitness
- iv. Family type
- v. Family size
- vi. Farm size
- vii. Annual income
- viii. Farming experience
- ix. Training exposure
- x. Organizational participation
- xi. Individual extension contact
- xii. Group extension contact
- xiii. Mass extension contact
- xiv. Participation in decision making process regarding homestead agricultural production
- xv. Attitude toward homestead agriculture and
- xvi. Innovativeness

Dependent variables

1. Contribution in vegetable cultivation
2. Contribution in post-harvest activities
3. Contribution in poultry raising
4. Contribution in livestock rearing
5. Contribution in tree plantation
6. Contribution in fish cultivation

These were the contributions by the women for doing homestead agricultural activities of the selected items of the agricultural production. Then the contributions by the respondents in various operations of these items were identified separately.

Research and null hypotheses of the study

The research hypotheses of the study were as follows:

Each of the 16 selected characteristics of the women will have significant contributions to each of their i) vegetable cultivation, ii) post-harvest activities, iii) poultry raising, iv) livestock rearing, v) tree plantation and vi) fish cultivation.

However, in order to test these research hypotheses. This was converted into the null form as follows:

Each of the 16 selected characteristics of the women will have no significant contribution of their i) vegetable cultivation, ii) post-harvest activities, iii) poultry raising, iv) livestock rearing, v) tree plantation and vi) fish cultivation.

To examine thoroughly the relationship between the dependent and independent variables correlation test was done. To measure the contribution and effects of independent variables on dependent variables, the full model and stepwise multiple regression and path coefficient analysis were conducted. Five percent (0.05) level of probability was the basis for rejecting the null hypothesis.

Research findings

The findings of this research have been described very briefly in this section.

Characteristics profile of women

In four age categories such as 18-28 years, 29-39 years, 40-50 years and 51-61 years, about 44 percent respondents belonged to age group of 40-50 years. Near about three-fourth of the respondents (74 percent) belonged to the aged group of 29-39 and 40-50 years. A significant number of respondent (24 percent), were able to sign only. One-third (33 percent) had primary level of education. Nearly one fourth (26 percent) had secondary and higher secondary level of education, only 17 percent were illiterate. Majority of the respondents (94 percent) were physically fit to perform their homestead agricultural activities and considerable

number (46 percent) of the women had either 21-30 years and or more than 30 years of experience in homestead agricultural activities. More than half (53.5 percent) of them were small farm size category farmers and 54 percent had no association with any organization. Majority of the rural family (49 percent) had medium annual income and nuclear type of family. Nearly half of the women had no involvement in groups and mass extension contact. But half of them (58 percent) had low individual extension contact. There are four ways through which women generally take decision regarding homestead agricultural activities namely husband and wife jointly, wife alone, husband alone and relatives. Most of the decisions were taken by women alone.

Vast majority (86 percent) of the women did not received any agricultural training.

More than half of the respondents (58 percent) had moderately to high favourable attitude toward homestead agricultural activities and near about 50 percent women were moderate innovativeness in nature.

Contribution of women in homestead agricultural production

The overall contribution in each activity was measured through classifying the respondents into four categories based on their contribution score e.g. very low, low, medium and high contribution with calculation of percent, mean and standard deviation. However, a comparative contribution in ten selected items under each of the activities was computed using contribution index. It was observed that highest percentage of the women contributed in each of the six selected homestead agricultural activities such as, 47% in vegetable cultivation, 43% in post-harvest activities, 47% in poultry raising, 46% in livestock rearing, 35% in tree plantation and 27% in fish cultivation. Comparative contribution analysis revealed that 'collection and preservation of seeds', 'storing rice', 'cleaning the poultry house', 'looking after kids', 'collection of seed' and 'lime application' occupied 1st position among the items of contribution under

homestead vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation with contribution index of 386, 344, 376, 332, 360 and 352, respectively.

Relationship between independent and dependent variables

It was found that out of 96 correlation tests, 75 were statistically significant (66 positive and 9 negative). Education, attitude toward homestead agriculture, innovativeness, mass extension contact and farm size shows the highest number of significant correlation (6+6+6+6+6), all of them are positive. Organizational participation, individual extension contact, group extension contact, decision making process, annual income and training exposure each of them render five significant correlation. On the other hand, age and farming experience had only one significant correlation.

Among the dependent variables post-harvest activities correlated with 15 independent variables, vegetable cultivation and poultry raising correlated with 14 independent variables, livestock rearing and fish cultivation correlated with 13 independent variables but tree plantation correlated with only 6 independent variables.

Several independent variables were significantly related with six dependent variables. In order to measure the contribution and effects of independent variables on the dependent variables, regression coefficient and path coefficient analysis were conducted.

Contribution and effects of independent variable on dependent variables

Full model multiple regression analysis showing the combined contribution of sixteen independent variables on homestead agricultural activities by women in vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation are presented below. The table is self-explanatory.

Dependent variables	Combined contribution of the sixteen independent variables (in percent)
Contribution in homestead agricultural production by women in vegetable cultivation	43
Contribution in homestead agricultural production by women in post-harvest activities	43
Contribution in homestead agricultural production by women in poultry raising	25
Contribution in homestead agricultural production by women in livestock rearing	28
Contribution in homestead agricultural production by women in tree plantation	13
Contribution in homestead agricultural production by women in fish cultivation	23

Stepwise multiple regression analysis revealed that out of sixteen independent variables only 3 contributed 41 percent of the total variance on contribution in vegetable cultivation whereas 3 variables contributed 34 percent of the total variance on contribution in post-harvest activities, only 3 variables contributed 22 percent of the total variance on contribution in poultry raising. 3 variables contributed 22 percent and 17 percent of the total variance on contribution in Livestock rearing and fish cultivation. But only 2 variables contributed 12 percent of the total variance on contribution in tree plantation as shown below:

Dependent variables	Combined variable contribution of the sixteen independent variables in percent	Contributors
Contribution in homestead agricultural production of vegetable cultivation	41	Education Physical fitness Training exposure
Contribution in homestead agricultural production of post-harvest activities	34	Education Family size Training exposure
Contribution in homestead agricultural production of poultry raising	22	Education Physical fitness Farm size
Contribution in homestead agricultural production of live stock rearing	22	Individual extension contact Family size Farm size
Contribution in homestead agricultural production of tree plantation	12	Farm size Family size
Contribution in homestead agricultural production of fish cultivation	17	Education Family size Training exposure

To measure the direct and indirect effects of selected independent variables on contribution by the women in homestead agricultural production of stated items, path coefficient analysis was done. It was revealed that education had high positive direct effects on contribution in vegetable cultivation, post-harvest activities, poultry raising and fish cultivation. Family size had direct positive effect on contribution in post-harvest activities, livestock rearing, tree plantation and fish cultivation. Farm size had direct positive effect on contribution in poultry raising, livestock rearing and tree plantation.

Conclusions

Based on the findings of the study and their logical interpretations, the following conclusions were made:

Women of the study area are contributing in each of the selected homestead agricultural activities *i.e.*, homestead vegetable cultivation, post-harvest

activities, poultry raising, livestock rearing, tree plantation and fish cultivation and the extent of contribution is high in all cases which is encouraging. In fact, these activities are mostly performed by women in our country and have rightly been reflected in the present study. Of course, their extent of contribution in different items under each activity varied depending on nature of the activity, availability of inputs, technical know-how and also due to other characteristics of the women. So, there is a need for strengthening extension services by GOs and NGOs to ensure a continuous flow of information and technical know-how to the women for enhancing their skills and knowledge in the respective areas.

Though contribution is high in the selected activities, question arises about productivity of the enterprises that has been studied. It is very important to know the present level of production to find possible means for its improvement because contribution is not enough to increase production.

1. More than half (53 percent) of the respondents had very low to medium contribution in vegetable cultivation. 57 percent of the respondents had very low to medium contribution in post-harvest activities, 53 percent in poultry raising, 54 percent in livestock rearing, 65 percent in tree plantation and 73 percent in fish cultivation. The findings revealed that women had a very limited contribution in homestead agricultural production. This may be due to the fact that a considerable proportion of the women had illiteracy, had no or low organizational participation, low information sources use (individual, group, mass), low innovativeness and unfavourable attitude towards homestead agriculture. For achieving agricultural development high level of women contribution in homestead agricultural production is desirable, but the existing situation is quite reverse. The findings, hence, suggest the need for greater emphasis for devising ways and means to improve women contribution in production of homestead agriculture and look into these issues thoroughly from local and national perspectives.

2. Age of the women had no significant relationships (except post-harvest activities) with their contribution in homestead agricultural production. It means housewives of all ages (starting from 18 to 61, as found in the present study) somehow were engaged in homestead agricultural production.
3. More than half (59 percent) of the women in the study area were literate. Education of the women has a considerable high significant positive relationship with their contribution in homestead agricultural production. Findings of stepwise multiple regression analyses also indicated that education had the highest significant contribution upon women contribution and it only accounts for 37.6 percent on vegetable cultivation, 30.6 percent on post-harvest activities and 15.5 percent on poultry raising and 12.7 percent on fish cultivation of the total variance. Path analysis also indicated that education had the highest direct positive effect and substantial indirect effect on women contribution. It means that education is the crucial factor influencing women contribution. Education is generally believed to have the effect of widening the mental horizon of an individual and thereby predisposes her to be receptive to new ideas. However, more than two-thirds (74 percent) of the women in the study area are illiterate and primary educated. All these facts lead to the conclusion that non-formal adult education programme and mass literacy programme on homestead agricultural production will be specially designed for illiterate and less educated women.
4. Correlation test indicated a moderate significant positive relationship between farm size and women contribution in the homestead agricultural production. This means that the bigger the farm size the higher was their contribution. The finding also reveal that the contribution of the women having medium to large farms was the highest in comparison to women having marginal farms and small farms. Hence, 74 percent of the women

having marginal and small farms have comparatively lower contribution than the women of medium or large farms. Above facts lead to the conclusion that more attention may need to be paid towards the marginal and small farm women, so that they become conscious about production of homestead agriculture.

5. More than three-quarters of the women had very low to medium income. Correlation test indicated positive relationship between annual income of the women and their contribution. The findings also implied that 90 percent of the women were under very low to medium income categories having comparatively lower contribution than the women of high income category. High income category of the women are generally respected persons in their locality. Change agents of different GOs and NGOs prefer them to communicate first and discuss about new idea and concept, which make them conscious about production of homestead agriculture. Above facts lead to the conclusion that necessary steps should be taken to pay more attention to very low to medium income women so that they become conscious about production of homestead agriculture.
6. Near about three-quarters (73 percent) of the women in the study area had no to low organizational participation. This might be due to their lack of education, family education and information sources (individual, group, and mass extension contact). Organizational participation of the women has a positive relationship with their contribution of the homestead agricultural production.
7. Correlation test indicated significant positive relationship between family size and their contribution of all items of homestead agricultural activities. Most of the women (56 percent) in the study area had medium to large family size. Multiple regression analysis indicated that family size had somewhat significant contribution by the women in homestead agricultural production.

Path analysis indicated that family size had second highest positive direct effect on women contribution. Such consideration lead to the conclusion that enough motivational training and mass media exposure are needed for small or medium family size category of women to make them aware on homestead agricultural production.

8. Training experience was also found as an important factor contributing to homestead agricultural production by the women. Training improves knowledge and skills of the women. But majority (86 percent) of the women in the study area had no training experience. This indicates serious weaknesses of the GO-NGO extension systems. In almost all agricultural development programs and project of the GOs and NGOs, there is the provision of training for the women. Non-receipt of any training by 86 percent of the women raises questions about the effectiveness of the implementation of various training programs. Thus, it may be concluded that if the women could have easy and effective access to various training opportunities and if the training activities of the GOs and NGOs could be strengthened, the contribution of the women in the production of homestead agricultural could be greatly minimized. Efforts should, therefore, be made to improve existing knowledge and skills of the women through organizing need based practical training for the women in connection with needed skill for homestead agricultural production.
9. Near about seventy percent (68 percent) of the women had no or had low individual extension contactness. 73 percent of the women had no or had low group extension contact and 80 percent of the women had no or had low mass extension contact. Communication exposure was a significantly contributory factor to both knowledge and skill of the women. Exposure to various extension/communication media enables a women to expand her horizon of knowledge and broaden the outlook. Through interaction with various sources

of information, it is possible that a women can gather relevant information about the production of homestead agriculture. It is, therefore, concluded that the contribution gaps of the large majority of the women will be reduced if they are motivated to make use of various extension media in one hand and adequate opportunities are created for their easy access to the extension communication media.

10. About three-quarters (70 percent) of the women had less favourable to moderate favourable attitude towards homestead agricultural production. Attitude towards homestead agriculture of the women had considerable high positive relationship with their contribution in homestead agriculture. Hence, contribution of less favourable and moderate favourable attitude category of women is lower than that of vavourable attitude category. In view of these facts it is necessary to train or motivate women having less favourable to moderate attitude towards homestead agriculture on different aspects in production.
11. Innovativeness of the women was found the highest contributing factor to contribution of homestead agricultural production. But 75 percent women had low to medium innovativeness category. Generally, women having higher innovativeness are quickly motivated to adopt modern practices than poor innovative ones due to their high knowledge, education and positive attitude towards innovations. Such facts lead to the conclusion that unless proper action is taken to increase the innovativeness of the women, none of the plans for higher contribution will bring any satisfactory result.

Recommendations

One the basis of findings of the study some recommendations were made which have been divided into two groups as: recommendations for policy implication and recommendation for further studies. These are stated below:

Recommendations for policy implication

Many potential homestead agricultural production technologies released by different research organizations were poorly informed to the women due to limitations in technology transfer process. The women can not cope with the latest technologies with their existing knowledge, skills and attitudes. The existing knowledge level of the women on various production practices of modern homestead agriculture being poor, the concerned authorities should take appropriate measures to increase the practical knowledge and skills of the women. This can be achieved through such means as:

1. Training program for rural women should be arranged in providing existing improved knowledge and technologies regarding homestead agricultural activities specially vegetable cultivation, poultry raising, livestock rearing and fish cultivation. It should be mentioned as an important point that all category women should be considered as the target population and effective training should be conducted in the villages in appropriate time.
2. For effective involvement and utilization of rural women, location specific off- farm job opportunities should be incorporated. In this regard agro-based and small scale rural industries should be established for provision of goods and services such as processing food, tailoring, handicraft, potteries etc. Credit facilities and managerial training should be provided for women in trade and commerce. They should also be encouraged to explore the use of locally available raw materials in the production of marketable goods.
3. Improved technologies related to homestead agricultural production should be developed on priority basis, which should be cost effective and within the purchasable capacity of the reach of rural poor farm family.
4. Organizational participation and group extension contact can help an individual to work in cooperation with others for solution to various problems. In this study there were significant relationship of the concerned variables with the contribution of homestead agricultural production. So,

rural women should be encouraged to participate in different related organizations and groups.

5. Department of Agricultural Extension (DAE) should pay more attention to rural women. Rural farm women generally face problems to make face to face contact with male extension agents. So, suitable and effective programme should be launched to reach the half of the population and incorporated them into the mainstream of the national development. Therefore, it is recommended to recruit more female extension workers for different projects of DAE and other organizations.
6. Proper extension approach should be developed to educate the rural women regarding homestead agricultural activities. It is further recommended that an effective and integrated extension approach should be evolved for the women folk of the rural society.
7. Near future a separate division for the women should be established under DAE.

Recommendations for future study

On the basis of scope and limitations of the present study and observation made by the researcher, the following recommendations are made for future study:

1. The study was conducted in only four villages of Rajshahi district. The findings of this study need to be validated by similar research in other parts of the country.
2. Findings in respect of annual income indicated that majority of women had very low income. To raise their economic status, action-oriented research programmes should be undertaken for further development of the economic status of the rural women.
3. The findings indicate that the extension media contact (individual, group, and mass) of women is very low. Research should be conducted particularly for their preference and nature of exposition to different media.

4. Research should be done and highlight the changing occupational structures and employment patterns for rural women folk and to identify the off-farm activities for utilization of time.
5. There are many personal, economic, social and psychological characteristics of the women which largely determine women contribution in different activities. The present study has investigated the relationships of 16 characteristics of the women on their contribution. Hence, there is a need for exploring the relationships of characteristics other than these 16 characteristics with women contribution.
6. Age and farming experience of the women is likely to have relationship with their contribution of the homestead agricultural production. But this study does not indicate any relationship of these variables with women contribution. There is a need for future study to find out the reasons.
7. Correlation test reveals that training exposure had significant positive relationship with contribution. But path analysis indicated that this variable has negative direct effects on contribution. Though this contradictory result was possible due to the multi-collinearity problem, but it is recommended that further study should be needed to explore the relationships and effects of this variable on women contribution.
8. Problem-oriented research should be done to demonstrate the strength and weakness affect the standard of living of rural women as well as their family.

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APPENDIX I

(English Version of the Preliminary Interview Schedule)

Department of Agronomy and Agricultural Extension
Rajshahi University, Rajshahi.

“Contribution of Women in Homestead Agricultural Production in
Rajshahi district of Bangladesh”

Serial No. Date of interview

1. Village Union Upazila
.....

2. Name of the respondent
Father's/Husband's name

3. Have you engaged in homestead agricultural production activities in the last
year (2003-2004)? If yes, please answer the following:

Name of the items of homestead agricultural production	Time spent/day
Homestead vegetable cultivation	
Post-harvest activities	
Poultry raising	
Livestock rearing	
Tree plantation	
Fish cultivation	

4. Please provide particulars of your farm size

Types of land use	Amount of land		Total
	Localunit	Hectare	
House hold			
Own land under own cultivation			
Own land given to other on borga			
Land taken from other on borga			
Pond			
Garden			
Fallow land			
Nursery			
Total			

Signature of respondents

Thank You

APPENDIX II

এছোনমী এ্যান্ড এগ্রিকালচারাল এক্সটেনশন বিভাগ
রাজশাহী বিশ্ববিদ্যালয়, রাজশাহী

"Contribution of women in Homestead Agricultural
Production in Rajshahi District of Bangladesh"

সাক্ষাৎকার অনুসূচী

ক্রমিক নং :..... সাক্ষাৎকার গ্রহণের তারিখঃ

সাক্ষাৎকার দাতার নাম :..... পিতা/স্বামীর নামঃ

গ্রাম :..... ইউনিয়ন :..... উপজেলা :.....

(অনুগ্রহপূর্বক নীচের প্রশ্নগুলোর উত্তর দিন)

১. কৃষক পরিবারের বৈশিষ্ট্যঃ

ক) পরিবারের ধরণ : একক যৌথ

খ) পরিবারের সদস্য সংখ্যা

গ) উত্তরদাতার বয়স বছর

২. উত্তরদাতার শিক্ষাগত যোগ্যতাঃ অনুগ্রহ পূর্বক আপনার শিক্ষার লেভেল উল্লেখ করুনঃ

স্কুলে যাইনি শুধুমাত্র সহকরতে পারি শ্রেণী পাশ

৩. বসতবাড়ীতে কৃষি উৎপাদন করতে গিয়ে উত্তরদাতার শারিরিক সুস্থতাঃ

দৈহিকভাবে সুস্থ	দৈহিকভাবে অসুস্থ

৪. অনুগ্রহপূর্বক ২০০৩-২০০৪ সালে আপনার খামারের আকার সম্পর্কে উল্লেখ করুন :

ক্রমিক নং	জমি ব্যবহারের ধরণ	জমির পরিমাণ		মোট
		স্থানীয় একক	হেক্টর	
১.	বসতবাড়ী			
২.	নিজ জমি নিজের আওতাধীন চাষকৃত			
৩.	নিজের জমি অন্যের কাছে বর্গা দেওয়া			
৪.	অন্যের কাছ থেকে বর্গা নেয়া			
৫.	অন্যের কাছ থেকে লিজ নেয়া			
৬.	নিজের জমি অন্যকে লিজ দেয়া			
৭.	পুকুর			
৮.	বাগান			
৯.	পতিত জমি			
১০.	নাসরী			

৫. অনুগ্রহপূর্বক আপনার বাৎসরিক আয় উল্লেখ করুন।

নিম্নলিখিত কৃষি উৎসগুলো থেকে গত বছর আপনি কি পরিমাণ অর্থ উপার্জন করেছেন।

ক্রমিক নং	উৎপাদনের ধরণ	মোট উৎপাদন (স্থানীয় একক)	মূল্য/একক টাকা	মোট মূল্য টাকা
১.	মাঠ ফসল			
২.	শাকসবজী			
৩.	ফলমূল			
৪.	মাছ			
৫.	গবাদি পশু			
৬.	হাঁসমুরগী			
৭.	বৃক্ষ			
৮.	অন্যান্য			

৬. অনুগ্রহ করে আপনার বসত বাড়ীতে কৃষিউৎপাদন কাজের অভিজ্ঞতা উল্লেখ করুন বছর।

৭. আপনি কি কোন প্রশিক্ষণ নিয়েছেন? হ্যাঁ না।

যদি নিয়ে থাকেন তাহলে নীচে টিক চিহ্ন দিন।

ক্রমিক নং	প্রশিক্ষণের শিরোনাম	মেয়াদ	এজেন্সী
১.	শাকসবজী চাষের উপরে প্রশিক্ষণ		
২.	গবাদিপশু প্রতিপালন		
৩.	হাঁসমুরগী লালন পালন		
৪.	মৎস্য চাষ		
৫.	নার্সারী তৈরী		

৮. সাংগঠনিক সম্পৃক্ততাঃ

বিভিন্ন সাংগঠনিক কর্মসূচীতে আপনার অংশগ্রহণ সম্পর্কে উল্লেখ করুন।

ক্রমিক নং	পতিষ্ঠানের নাম	সম্পৃক্ত নই	সম্পৃক্ত			মেয়াদ কাল
			সদস্য হিসেবে	নির্বাহী সদস্য	চেয়ারম্যান সেক্রেটারী	
১.	মহিলা সমবায় সমিতি					
২.	BRDB সদস্য					
৩.	DAE কৃষক সমিতি					
৪.	ASA					
৫.	গ্রামীণ ব্যাংক					
৬.	CARE					
৭.	BRAC					
৮.	প্রশিকা					
৯.	ঠেঙ্গামারা মহিলা সবুজ সংঘ					

৯. অনুগ্রহ করে আপনার সম্প্রসারণ যোগাযোগের ধরণ সম্পর্কে উল্লেখ করুনঃ

যোগাযোগের ধরণ	মাধ্যমের নাম	যোগাযোগের সংখ্যা			কখনও না
		নিয়মিত	মাঝে মাঝে	কদাচিৎ	
ব্যক্তিগত যোগাযোগ	কৃষি কর্মকর্তা (UAO) AAO AEO JAE0 পুরুষ SAAO মহিলা SAAO ASA কর্মী BRAC কর্মী G.Bank কর্মী SUS কর্মী PROSHIKA কর্মী প্রতিবেশী আত্মীয় স্বজন				
দলীয় যোগাযোগ	ফলাফল প্রদর্শন পদ্ধতি প্রদর্শন দলীয় আলোচনা প্রশিক্ষণ				
গণযোগাযোগ	রেডিও টেলিভিশন কৃষি প্রদর্শনী পোস্টার পেপার লিফলেট				

১০. বসতবাড়ীতে কৃষি কাজে সিদ্ধান্ত নেয়ার ব্যাপারে আপনার অংশগ্রহণ উল্লেখ করুনঃ

ক্রমিক নং	কাজ	স্বামী একা	স্ত্রী একা	স্বামী-স্ত্রী দুজনে মিলে	আত্মীয় স্বজন ও অন্যান্যসহ
১.	বসতবাড়ীর আসেপাশে শাকসবজি চাষ				
২.	বসতবাড়ীর আশে পাশে বৃক্ষ রোপন				
৩.	বসতবাড়ীতে হাঁস মুরগীর চাষ				
৪.	বাড়ীতে গবাদি পশু প্রতিপালন				
৫.	বাড়ীতে ফসল কর্তনের পরবর্তী কর্মসূচী				
৬.	বাড়ীর আশে পাশের পুকুরে মৎস্য চাষ				

১১. 'বসত বাড়ীতে কৃষি' এর প্রতি মনোভাব।

নিম্নলিখিত বিবৃতি গুলোতে আপনার মতামত ব্যক্ত করুন।

ক্রমিক নং	বিবরণ	মতামতের ধরণ				
		দৃড় ভাবে সম্মত	সম্মত	সিদ্ধান্ত হীনতা	একমত নই	মোটোও একমত নই
১ (+)	বসতবাড়ীর আশেপাশে শাকসবজির চাষ পরিবারের পুষ্টির জন্য অত্যাৱশ্যক					
২ (-)	বসতবাড়ীর আশেপাশে শাকসবজির চাষ একটি বাড়তি ঝামেলার কাজ। তাই আমি এটা এড়িয়ে চলার চেষ্টা করি।					
৩ (+)	বসতবাড়ীর আশেপাশে শাকসবজির নিবিড় চাষাবাদ একটি ভাল কৌশল কারণ এতে সারা বছর পরিবারের সবজির চাহিদা পূরণ করে এবং বাড়তি উপার্জন ও এনে দেয়।					
৪ (-)	শাকসবজির চাষে বাড়তি পরিশ্রম এবং যত্নের প্রয়োজন হয় তাই এই কাজে আমি আগ্রহী নই।					
৫ (+)	বাড়ীর আশে পাশে বৃক্ষ রোপন জ্বালানীর প্রধান উৎস।					
৬ (-)	বাড়ীর আশেপাশে বৃক্ষ রোপন করি না কারণ এটা থেকে লাভ পেতে দীর্ঘ সময় আপেক্ষা করতে হয়।					
৭ (+)	বসত বাড়ীতে হাঁসমুরগীর চাষ কোন কষ্টকর কাজ নয় এবং এটা আমার জন্য লাভজনক।					
৮ (-)	হাঁসমুরগীর মড়ক রোগে বিরাট ক্ষতিসাধন হয়। তাই আমি এই কাজে সম্মত নই।					
৯ (+)	ছাগল পালন খুব সহজ এবং ছাগলকে খাওয়াতে কোন বাড়তি খরচ হয় না তাই আমি ছাগল পালন পছন্দ করি।					
১০(-)	ছাগল বাড়ীর দানা শস্য, শাকসবজি, চারা গাছ ধবংস করে। এছাড়া মাঠের ফসলের ও ক্ষতি করে তাই প্রতিবেশীর সাথে দ্বন্দ্বের সৃষ্টি হয়। এই সব কারণে আমি ছাগল ও গরু পালনে আগ্রহী নই।					
১১(+)	দেশী জাতের তুলনায় মুরগীর বিদেশী জাত বেশী ডিম দেয় তাই আমি ইহা পছন্দ করি।					
১২(-)	আমি বিদেশী জাতের মুরগী পছন্দ করি না। কারণ এটা প্রতিপালনে অধিক যত্ন এবং খাবারের অনেক খরচ পড়ে যায়।					
১৩(+)	বাড়ীর আশেপাশের পুকুরে মৎসচাষ লাভজনক কারণ এতে পরিবারের চাহিদা পূরণ হয় এবং অর্থ আসে।					
১৪(-)	শীতকালে পুকুর শুকিয়ে যায় তাই মাছ চাষে উৎসাহী নই।					
১৫(+)	দুগ্ধবতী গাভী পালন লাভজনক কারণ দুধের মূল্য অতিউচ্চ।					
১৬(-)	গাভীর জন্য প্রতিদিন ঘাস সংগ্রহ করা বিরজিকর কাজ। খাবারের খরচ অনেকবেশী এই সব কারণে আমি গাভী পালন পছন্দ করছি না।					

১২. ইনোভেটিভনেস/নতুন কলাকৌশল গ্রহণ প্রবনতাঃ

অনুগ্রহপূর্বক নীচের আধুনিক পদ্ধতি বা কৌশল ব্যবহার করেন কি না উল্লেখ করুন।

ক্রমিক নং	পদ্ধতি/কৌশল	ব্যবহারের ধরণ		
		ব্যবহার করি না	এই বছর থেকে ব্যবহার করছি	২ বছর বা তার অধিক সময় আগে থেকে ব্যবহার করছি
১.	ইনটেনসিভ শাকসবজি চাষাবাদ মডেল অনুসরণ			
২.	শাকসবজির আধুনিক জাত ব্যবহার			
৩.	শাকসবজির পোকামাকড় দমনে পেস্টিসাইডের ব্যবহার			
৪.	গরু মোটাতাজা করণ			
৫.	গবাদি পশুর জন্য ইউরিয়া মোলাসেস ব্লক ব্যবহার			
৬.	পোল্ট্রির জন্য সুষম খাবার			
৭.	পোল্ট্রি এবং ক্যাটেলের জন্য Vaccination			
৮.	মাছের আধুনিক জাত ব্যবহার			
৯.	ওর স্যালাইন ব্যবহার			
১০.	পরিবার পরিকল্পনা পদ্ধতি মেনেচলা			

১৩. শাকসবজি চাষে Contribution.

অনুগ্রহপূর্বক শাকসবজি চাষে নিম্নলিখিত কাজগুলিতে আপনার অংশগ্রহণ উল্লেখ করুন।

ক্রমিক নং	আইটেম/আপারেশন	অংশগ্রহণের ধরণ		
		নিয়মিত	মাঝেমাঝে	কখনই না
১.	জমি নির্বাচন			
২.	কোদালের সাহায্যে বেড তৈরী			
৩.	জৈব ও রাসায়নিক সার প্রয়োগ			
৪.	বপন/রোপন			
৫.	চারা রোপনের পর মালচিং			
৬.	সেচ			
৭.	আগাছা দমন			
৮.	লতানো শাকসবজিতে সাপেটি দেয়া			
৯.	শাকসবজি উত্তোলন/হার্ভেস্টিং			
১০.	বীজ সংগ্রহ ও সংরক্ষণ			

১৪. পোষ্ট-হার্ভেস্টি কর্মচূচীতে অংশগ্রহণঃ

অনুগ্রহ পূর্বক ফসল কর্তনের পর নিম্নলিখিত কর্মসূচীতে আপনার অংশগ্রহণ উল্লেখ করুন।

ক্রমিক নং	আইটেম/আপারেশন	অংশগ্রহণের ধরণ		
		নিয়মিত	মাঝেমাঝে	কখনই না
১.	থ্রেসিং - ধান - অন্যান্য ফসল			
২.	ঝাড়ো - ধান - অন্যান্য ফসল			
৩.	শুকানো - ধান - অন্যান্য ফসল			
৪.	থ্রেডিং - আলু - অন্যান্য ফসল			
৫.	সংরক্ষণ - ধান - অন্যান্য ফসল			

১৫. হাঁস মুরগী পালনে অংশগ্রহণঃ

ক্রমিক নং	আইটেম/আপারেশন	অংশগ্রহনের ধরণ		
		নিয়মিত	মারোমারো	কখনই না
১.	হাঁস মুরগী সংগ্রহ			
২.	হাঁস মুরগীর ঘর তৈরী			
৩.	মুরগীর ঘর পরিষ্কার করা			
৪.	ডিম সংগ্রহ ও সংরক্ষণ			
৫.	ডিম তা দেয়ার জন্য ব্যবস্থা করা			
৬.	হাঁস মুরগীর বাচ্চার যত্ন নেয়া			
৭.	টীকা দেয়ার ব্যবস্থা নেয়া			
৮.	ডিম বিক্রয়			
৯.	খাওয়ানো			
১০.	মুরগী বিক্রয়			

১৬. গবাদি পশু প্রতিপালনে অংশগ্রহণঃ

অনুগ্রহ পূর্বক গবাদি পশু প্রতিপালনে নিম্নলিখিত কর্মসূচীতে আপনার অংশগ্রহন উল্লেখ করুন।

ক্রমিক নং	আইটেম/আপারেশন	অংশগ্রহনের ধরণ		
		নিয়মিত	মারোমারো	কখনই না
১.	গবাদি পশু সংগ্রহ			
২.	মাঠে চরানো			
৩.	সন্ধ্যাবেলায় মাঠ থেকে গবাদিপশু সংগ্রহ			
৪.	খাওয়ানোর জন্য পাতা সংগ্রহ			
৫.	গর্ভকালীন অবস্থায় অতিরিক্ত যত্ন নেয়া			
৬.	বাচ্চা প্রসবের সময় নার্সিং করা			
৭.	বাছুরের দেখাশুনা করা			
৮.	শীতকালে গায়ে কাপড় জড়ানো			
৯.	টীকা দেয়া			
১০.	বিক্রয়			

১৭. বৃক্ষ রোপনে অংশগ্রহণ (ফল এবং টিম্বার বৃক্ষ):

ক্রমিক নং	আইটেম/আপারেশন	অংশগ্রহনের ধরণ		
		নিয়মিত	মাবেমাবে	কখনই না
১.	সীড বেড তৈরী করা			
২.	চারা সংগ্রহ ও চারা তৈরী			
৩.	চারা রোপন			
৪.	চারার যত্ন নেয়া			
৫.	সেচ এবং সার প্রয়োগ			
৬.	ট্রেনিং/প্রুনিং			
৭.	প্রটেকটিভ মেজার			
৮.	ফল সংগ্রহ			
৯.	ফল এবং কাঠ বিক্রী			
১০.	রোগবালাই ও পোকামাকড় নিয়ন্ত্রণ			

১৮. মৎস্য চাষে অংশ গ্রহণ:

ক্রমিক নং	আইটেম/আপারেশন	অংশগ্রহনের ধরণ		
		নিয়মিত	মাবেমাবে	কখনই না
১.	পাঁড় বাঁধানো			
২.	আগাছা দূর করা			
৩.	পুকুরে রোটেনন প্রয়োগ			
৪.	পুকুরে চুন প্রয়োগ			
৫.	পুকুরে সার প্রয়োগ			
৬.	ফিডিং রিং তৈরী করা			
৭.	মাছের জাত নির্বাচন			
৮.	পুকুরে খাবার দেয়া			
৯.	মাছ ধরা			
১০.	বিক্রয়			

১৯. নিম্নলিখিত কৃষি উৎপাদন কর্মসূচী করতে গিয়ে আপনি কি কি সমস্যার সম্মুখীন হয়েছেন তা উল্লেখ করুনঃ

ক্রমিক নং	বসতবাড়ীতে কৃষি উৎপাদন কর্মসূচী	সমস্যার ধরণ	Ranking
১.	শাকসবজি চাষ	১. ২. ৩. ৪. ৫. ৬. ৭.	
২.	ফসল উত্তোলন উত্তর কর্মসূচী	১. ২. ৩. ৪. ৫. ৬. ৭. ৮.	
৩.	হাঁস -মুরগী পালন	১. ২. ৩. ৪. ৫. ৬. ৭. ৮.	
৪.	গবাদিপশু প্রতিপালন	১. ২. ৩. ৪. ৫. ৬. ৭. ৮.	
৫.	বৃক্ষ রোপন	১. ২. ৩. ৪. ৫. ৬. ৭.	
৬.	মৎস্য চাষ	১. ২. ৩. ৪. ৫. ৬. ৭. ৮.	

আপনার সহযোগিতার জন্য ধন্যবাদ

সাক্ষাৎকার গ্রহণকারীর

স্বাক্ষর

তারিখ :
.....

APPENDIX III

Department of Agronomy and Agricultural Extension University of Rajshahi Rajshahi-6205

"Contribution of Women in Homestead Agricultural Production in Rajshahi District"

INTERVIEW SCHEDULE

Serial no. Farm category Date of interview

Identification of Respondent

Respondent Name Respondent's husband/father's
Name..... Village Union Upizila

(Please answer the following questions)

1. Particulars' of farm family

- i. Family type: nuclear joint
- ii. Number of family member
- iii. Age of the respondentyears.

2. Education of the respondent: Please mention your level of education.

No Schooling Can sign only Class (passed)

3. Physical fitness of the respondent to do homestead agricultural production activities:

Physically well	Physically Sick	Extent of Sickness		
		Always	Sometime	Rarely

4. Please provide particulars of your farm size.

Sl. No.	Type of land use	Amount of land		Total
		Local unit	Hectare	
1	Household			
2	Own land under own cultivation			
3	Own land given to other on barga			
4	Land taken from other on barga			
5	Land taken from other on lease			
6	Pond			
7	Garden			
8	Fallow land			
9	Nursery			

5. Please mention your annual income.

How much money you received from the following agricultural sources last year?

Sl. No.	Name of the product	Total production (local unit)	Price/Unit (Tk.)	Total price (Tk.)
1	Field crops			
2	Vegetables			
3	Fruits			
4	Fish			
5	Cattle and goat			
6	Poultry			
7	Trees			
8	Others			

6. Please mention your experience in the homestead agricultural production years.

7. Have you received following training? Yes No. if yes, please put tick mark against the items.

Sl. No.	Title of training received	Duration	Agency
	Training on vegetable production		
	Training on live-stock rearing		
	Training on poultry raising		
	Training on fish cultivation		
	Training on nursery		

8. Organizational Participation.

Please mention your involvement in organizational activities.

Name of the organization	No involvement	Involvement			Duration
		Member	Executive member	Chairman/Secretary	
Mohila Samabay Somity member					
BRDB member					
DAE farmers association					
ASA					
Grameen Bank					
CARE					
BRAC					
PROSHIKA					
Thengamara Mohila Shobuj Shongho					

9. Please give your particulars of extension contact.

Type of contact	Name of media	Frequency of exposure (number)			
		Regularly	Occasional	Rarely	Never
Individual	Agriculture officer (UAO) AAO AEO JAEO Male SAAO Female SAAO				
	ASA worker BRAC worker G. Bank Worker SUS worker Neighbour PROSHIKA worker Relative				
Group contact	Result demonstration Method demonstration Group discussion Training				
Mass Contact	Radio TV Agricultural exhibition Poster Paper Leaflet				

10. Please indicate your participation in decision-making process regarding homestead agricultural production.

Sl. No.	Activities	Husband alone	Wife alone	Husband and wife	Relative and other
1	Homestead vegetable cultivation				
2	Post-harvest activities				
3	Poultry raising				
4	Livestock rearing				
5	Homestead tree plantation				
6	Fish cultivation				

11. Attitude towards homestead agriculture.

Please indicate your opinion regarding the following statements.

Sl. No.	Activities	Nature of opinion				
		Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1. (+)	Vegetable cultivation in the homestead area is essential for family nutrition.					
2. (-)	Vegetable cultivation in the homestead is an extra botheration to me, hence I try to avoid it.					
3. (+)	Intensive vegetable cultivation in the homestead is a good technique that meets vegetable requirement of the family round the year and also provides some income.					
4. (-)	Vegetable cultivation is expensive requires extra labour and care that's why I am not interested in it.					
5. (+)	Trees planted in the homestead are main source of fuel.					
6. (-)	Did not plant trees (for timber) in the homestead, as it requires long time to get return from it.					
7. (+)	Raising poultry in the homestead is not a cumbersome job but it is profitable to me.					
8. (-)	Epidemic disease of poultry incurs huge loss. Hence, I do not prefer raising poultry.					
9. (+)	Goat rearing is easy and does not require extra cost for feeding that is why I prefer it.					
10. (-)	Goat destroys food grain, vegetables, and seedlings of trees in the homestead. It also destroys other's crop field, which creates conflict among the neighbors. Due to these reasons I do not rear goat & cattle.					

11. (+)	Foreign breeds of poultry give more eggs compared to local breed, So I like it.					
12. (-)	I do not like foreign breed of poultry, as it requires much care and costly feed.					
13. (+)	Fish culture in the homestead pond is profitable as it serves family consumption and also provides cash.					
14. (-)	Drying of pond in the winter discourages me growing fish.					
15. (+)	Rearing milk cow is profitable as the price of milk is high.					
16. (-)	Collection of grass for the cow everyday is a tedious job. Feed cost is also high. Thus I do not like to rear milk cow.					

12. Innovativeness.

Please mention extent of use of the following modern practices/methods.

Sl. No.	Practice/Method	Extent of use		
		Do not use	Using from this year	Has been using from 2 or more years
1	Intensive vegetable cultivation model			
2	Modern varieties of vegetables			
3	Pesticides application for control insect-pest of vegetables			
4	Beef fattening			
5	Urea-molasses block for cattle			
6	Balance feed for poultry			
7	Vaccination to poultry and cattle			
8	Modern breeds of fish			
9	Orsaline			
10	Family planning methods			

13. Contribution in the homestead vegetable cultivation.

Please indicate your extent of contribution in the following items of vegetable cultivation:

Sl. No.	Item/operation	Extent of participation		
		Regular	Occasional	Never
1	Land selection			
2	Bed preparation using spade			
3	Application of manures and fertilizers			
4	Sowing/transplanting			
5	Mulching after transplanting of seedlings			
6	Irrigation/drainage			
7	Weeding			
8	Support arrangement for creeper vegetables			
9	Harvesting			
10	Collection and preservation of seed			

14. Contribution in the post-harvest activities.

Please indicate your extent of contribution in the following items of post-harvest activities.

Sl. No.	Item/operation	Extent of participation		
		Regular	Occasional	Never
1	Threshing - Rice - Other crops			
2	Winnowing - Rice - Other crops			
3	Drying - Rice - Other crops			
4	Grading - Potato - Other crops			
5	Storing - Rice - Other crops			

15. Contribution in poultry raising

Please indicate your extent of contribution in the following items of poultry raising.

Sl. No.	Item/operation	Extent of participation		
		Regular	Occasional	Never
1	Collection of hen			
2	Making the poultry house			
3	Cleaning the poultry house			
4	Collection and preservation of eggs			
5	Arrangement for hatching eggs			
6	Care for the chicks			
7	Arrangement for vaccination			
8	Selling eggs			
9	Feeding			
10	Selling birds			

16. Contribution in livestock rearing.

Please indicate your extent of contribution in the following items of livestock rearing.

Sl. No.	Item/operation	Extent of participation		
		Regular	Occasional	Never
1	Collection of Livestock			
2	Grazing in the field			
3	Collection of livestock from the field during evening			
4	Collection of leaves for feeding			
5	Care during pregnancy			
6	Nursing during labour			
7	Looking after the kids			
8	Clothing during winter			
9	Vaccination			
10.	Selling			

17. Contribution in tree plantation (Fruit & Timber plants)

Please indicate your extent of contribution in the following items of tree plantation.

Sl. No.	Item/operation	Extent of participation		
		Regular	Occasional	Never
1	Preparation of seed bed			
2	Collection and raising seedling			
3	Plantation tree seedling			
4	Nursing and care of tree seedling			
5	Irrigation and manuring			
6	Training/Pruning			
7	Protective measure			
8	Control disease & pest			
9	Fruit harvesting			
10	Selling fruits and timbers			

18. Contribution in fish cultivation.

Please indicate your extent of contribution in the following items of fish cultivation.

Sl. No.	Item/operation	Extent of participation		
		Regular	Occasional	Never
1	Dike repairing			
2	Removal of weed			
3	Rotenone application			
4	Application of lime			
5	Fertilizer apply			
6	Preparation of feeding ring			
7	Selection of species			
8	Application of feed			
9	Harvesting			
10	Selling			

19. Please put tic mark against the constraints you face during the homestead agricultural activities.

Sl. No.	Homestead agricultural activities	Nature of problem	Ranking
1	Vegetable production	1. 2. 3. 4. 5.	
2	Post-harvest activities	1. 2. 3. 4. 5.	
3	Poultry raising	1. 2. 3. 4. 5.	
4	Livestock rearing	1. 2. 3. 4. 5.	
5	Tree plantation	1. 2. 3. 4. 5.	
6	Fish cultivation	1. 2. 3. 4. 5.	

Signature of the respondent

Thank you very much.

APPENDIX IV

Construction of the Attitude Scale

In order to measure the attitude of the women the attitude scale was developed in the following way. In constructing any scale using the available technique, the Thurston's equal appearing interval scale and Likert's (1932) summated rating scales are quite well known. The Thurston's and Chave (1929) technique requires a large number of items and judges. This technique is time consuming and requires calculation values of all items. The Likert's technique has no such difficulties. A most comprehensive comparison of the two techniques is to be found in Edwards and Kenny (1949). This investigation tested Thurston and Likert type scales from the same universe of attitudinal statement and found the two techniques fairly comparable. So, in the present study Likert summated ratings method was used.

Collection of items

Twenty attitude statements about homestead agricultural production of vegetable cultivation, post-harvest activities, poultry raising, livestock rearing, tree plantation and fish cultivation were collected initially from sources like progressive farmers, agricultural scientists, extension specialist, available literature, unpublished, theses and researcher's own experience. The statements were examined and edited as per 16 criteria set up by Edwards (1957).

Item selection

This phase consisted of determining the relevance of a particular statement and eliminate those, which did not discriminate well between person holding different attitude. As the basis for rejecting statements in the method of summated rating item analysis was used as suggested by Edwards (1957). Item analysis is an important step to construct valid and reliable scale. For item analysis, the items were first administered to a random sample of 30 women in the study area and these women were different from the final sample. The selected women were asked to give their reactions to each statement on the five

point continuum i.e. strongly agree, agree, undecided, disagree and strongly disagree. The scoring pattern was 5, 4, 3, 2 and 1 for positive statements and 1, 2, 3, 4 and 5 for the negative statements. The score for each individual on the scale was computed by summing the weights or the individual item response.

Then critical ratio value (t-value) was used for item selection. Following Edwards (1957) the farmers were arranged in the ascending order according to their total scores. The criteria groups i.e. the 25% of the women having the highest total scores and the 25% of the women having the lowest total scores were separated for the calculation of t-values.

The critical ratio for each individual statement was worked out by using the following formula suggested by Edwards (1957).

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum (X_H - \bar{X}_H)^2 + \sum (X_L - \bar{X}_L)^2}{n(n-1)}}$$

Where,

$$\sum (X_H - \bar{X}_H)^2 = \sum X_H^2 - \frac{(\sum X_H)^2}{n}$$

and

$$\sum (X_L - \bar{X}_L)^2 = \sum X_L^2 - \frac{(\sum X_L)^2}{n}$$

$\sum X_H^2$ = Sum of the squares of the individual scores in high group

$\sum X_L^2$ = Sum of the squares of the individual scores in the low group

$\sum \bar{X}_H$ = The mean score on a given statement for the high group

$\sum \bar{X}_L$ = The mean score on a given statement for the low group

n = Number of subjects (respondents) in each group

Item No.	Statements	t-value
1 ⁺	Vegetable cultivation in the homestead area is essential for family nutrition	3.65
2 ⁻	Vegetable cultivation in the homestead is an extra botheration to me, hence I try to avoid it.	4.88
3 ⁺	Intensive vegetable cultivation in the homestead is a good technique that meets vegetable requirement of the family round the year and also provides some income.	3.30
4 ⁻	Vegetable cultivation is expensive requires extra labour and care that's why I am not interested in it.	4.80
7 ⁺	Trees planted in the homestead are main source of fuel.	5.56
8 ⁻	Did not plant trees (for timber) in the homestead as it requires long time to get return from it.	5.32
5 ⁺	Homestead vegetable cultivation does not influence environmental pollution	.88*
6 ⁻	Lack of knowledge about the sources of seeds and seedling hampers homestead vegetable cultivation.	.64*
9 ⁺	Goat rearing is easy and does not require extra cost for feeding that is why I prefer it.	3.56
10 ⁻	Goat destroys food grain, vegetables, and seedlings of trees in the homestead. It also destroys other's crop field which creates conflict among the neighbours. Due to these reasons I do not rear goat & cattle.	1.90
11 ⁺	Foreign breeds of poultry give more eggs compared to local breed, so I like it.	4.04
12 ⁻	I do not like foreign breed of poultry, as it requires much care and costly feed.	2.65
13 ⁺	Poultry raising in homestead does not require extra cost but it met up our protein need of our body.	1.41*
14 ⁻	Poultry raising creates a unhygienic environment in homestead so, I am not interested to do it.	1.30*
15 ⁺	Fish culture in the homestead pond is profitable as it serves family consumption and also provides cash	5.35
16 ⁻	Drying of pond in the winter discourages me growing fish	4.22

17 ⁺	Rearing milk cow is profitable as the price of milk is high.	4.30
18 ⁻	Collection of grass for the cow everyday is a tedious job. Feed cost is also high. Thus I do not like to rear milk cow.	4.30
19 ⁺	Raising poultry in the homestead is not a cumbersome job but it is profitable to me.	3.70
20 ⁻	Epidemic disease of poultry incurs huge loss. Hence I do not prefer raising poultry.	5.86

The critical values were calculated for each of the 20 statements, which had been introduced to the 30 farmers. The value of *t* is a measure of the extent to which a given statement differentiate between the high and low groups. As crude and approximate rule of thumb, it may be regarded any *t*-value equal to or greater than 1.75 as indicating that the average response of the high and low group to a statement. The 't' values for the 20 statements were listed in the ascending order. The range of values was .64 to 5.86. As suggested by Edwards (1957), there is a thumb rule of rejecting items with 't' value less than 1.75. Kashem (1986), Rahman (1990) and Islam (2000) in Bangladesh followed the same rule. As such, 16 statements were finally selected for the attitude scale. The statements were arranged randomly in the scale in order to have real attitude unbiasedly.

Scoring and administering the attitude scale

The 16 selected statements for final format of the attitude scale were randomly arranged to avoid response biase, which might contribute to low reliability of scale. The women were asked whether they strongly 'disagree with weights of 5, 4, 3, 2, and 1 for favourable or positive sentences and 1, 2, 3, 4 and 5 for unfavourable or negative sentences. Total attitude score of a women towards recommended practice of technology was equal to the sum of scores of all the 16 statements. Thus, range of attitude scores could be from 16 to 80, 16 indicating unfavourable attitude and 80 indicating favourable attitude.

APPENDIX V

Contribution Test Development Procedure

The steps followed in developing the contribution test in measuring the level of contribution of the women about the 6 selected practices of homestead agricultural production for this study are discussed below:

Item collection

The content of any test is composed of question called items. Various subject matter specialists, agronomist, horticulturists, livestock scientists, fisheries scientists, extension personnel of the study area, and literatures from different sources were consulted for collecting items. The selection of the items for contribution test was done, keeping the following two criteria.

- It should promote thinking rather than simply rote memorization
- Item should differentiate the well informed women from the poorly informed and should have a certain difficult value

Eighty questions (items) under 6 practices selected for the study were framed for contribution test. In framing of items naming, correct specification of the recommendation, advantage and disadvantages of practicing recommendations were emphasized. A schedule was prepared with these 80 items for administering for item analysis and screen out unimportant ones.

Item analysis

The item analysis of a test usually yields two kinds of information. Firstly, it provides an index of item difficulty and secondly an index of discrimination. The index of item difficulty indicates how difficult an item is, where as, the

index of discrimination explore to which an item discriminates the well informed women from the poorly informed ones. The items were checked and modified on the basis of pre-testing. The items were administered to a randomly selected 30 women for item analysis. The women for administering the items were different from the sample women for the present study. However, these 30 women were representative of the community. In which the final study was conducted. The item of question had two scores but some items had not scope to be scored partially i.e., the score for the correct answer was 2, and for incorrect answer 0 and other items had the scope to be scored as 2, or 1 or 0 for correct, partial correct, and incorrect response. Total score obtained by a respondent through correct answer against all the 80 items constituted her contribution score scored by her. Thus, a respondent could obtain the score within the limit of (0) and 160. After calculating the score obtained by each 30 of the women the scores were arranged highest to the lowest in order of magnitude. These 30 women were then divided in to six equal groups, each having five women and were arranged in descending order of total score obtained by them. These groups were named as G_1 , G_2 , G_3 , G_4 , G_5 and G_6 respectively. For item analysis, the two middle groups G_3 and G_4 were eliminated. Only four extremes groups with high and low scores were considered for item analysis.

Calculation of difficulty index

The difficulty index of an item was defined as the proportion of responses, which are correct. It is an inverse measure, the higher the numerical value of index of difficulty, the easier the test item. (Ebel, 1966) This was calculated by using the following formula.

$$P_i = n/N \times 100$$

P_i = Difficulty index in percentage of i th item

n = Total scores obtained from correct answer by all the women to whom the item was administered.

N = Total possible score that could be obtained by all women to whom was administered, that is 30 women in the present study and score were $30 \times 2 = 60$ as each item's score value was assigned two.

Calculation of discrimination index

It refers to the extent to which an item discriminates the well informed from the poorly informed. Discrimination index (indicated by Mehta, 1958) was worked out for each item by using the following formula.

$$E \frac{1}{3} = \frac{\{(S1+S2)-(S5+S6)\}}{N/3}.$$

N = Total number of women in item analysis i.e. 30.

Where,

$S1$, $S2$, $S5$ and $S6$ were the score of correct answers in $G1$, $G2$, $G5$ and $G6$ respectively and this method is suggested by Mehta (1958), Singh (1981), Ray and Bora (1991) and also used by Haider (2001) in Bangladesh.

The difficulty indices (P_i) and discrimination indices ($E \frac{1}{3}$) for the 80 questions are given below:

Sl. No.	Obtained scores from correct answers of high and low groups of women				Total obtained scores ($S_1+S_2+S_3+S_4+S_5+S_6$)	Total possible scores by 30 women	Difficulty index (P_i)	Discrimination index ($E \frac{1}{3}$)
	S_1	S_2	S_5	S_6				
1	6	8	2	3	23	60	0.38	0.90*
2	10	10	8	4	44	60	0.73	0.80
3	8	4	0	4	18	60	0.30	0.80
4	7	5	3	1	25	60	0.42	0.80
5	8	2	4	10	34	60	0.75	0.80
6	10	6	4	4	26	60	0.43	0.40
7	6	4	4	0	20	60	0.33	0.60
8	8	4	2	2	16	60	0.27	0.80
9	6	8	5	4	36	60	0.60	0.50
10	6	7	7	1	38	60	0.63	0.50
11	10	8	2	8	28	6	0.47	0.80
12	6	5	6	4	33	60	0.55	0.10
13	8	6	6	6	37	60	0.62	0.20
14	4	6	4	4	28	60	.047	0.20
15	5	7	5	6	32	60	0.53	0.10*
16	6	8	2	3	23	60	0.38	0.90*
17	6	6	4	2	20	60	0.33	0.60
18	7	8	6	7	43	60	0.72	0.20
19	9	7	3	6	38	60	0.63	0.70
20	7	4	3	6	26	60	0.58	0.20
21	7	6	2	2	25	60	0.42	0.90*
22	8	6	6	0	22	60	0.37	0.80
23	7	8	4	5	37	60	0.62	0.50
24	9	7	6	4	43	60	0.72	0.60
25	4	6	1	0	16	60	0.27	0.90*
26	6	7	4	4	35	60	0.58	0.50
27	10	8	4	5	38	60	0.63	0.90*
28	8	2	4	0	18	60	0.30	0.60
29	10	8	4	6	38	60	0.63	0.80
30	7	7	1	4	27	60	0.45	0.90*
31	4	6	2	2	22	60	0.37	0.60
32	10	6	4	4	34	60	0.57	0.80
33	8	8	6	4	38	60	0.32	0.10*
34	9	6	7	5	42	60	0.35	0.80
35	8	7	7	4	44	60	0.70	0.30
36	5	7	5	6	32	60	0.53	0.10*
37	7	8	4	3	39	60	0.63	0.80

38	5	7	5	6	32	60	0.53	0.10*
39	10	6	4	6	40	60	0.65	0.60
40	2	4	2	4	16	60	0.27	0.20
41	6	8	2	3	23	60	0.38	0.90*
42	10	10	8	4	44	60	0.73	0.80
43	8	4	0	4	18	60	0.30	0.80
44	7	5	3	1	25	60	0.42	0.80
45	8	2	4	10	34	60	0.75	0.80
46	10	6	4	4	26	60	0.43	0.40
47	6	4	4	0	20	60	0.33	0.60
48	8	4	2	2	16	60	0.27	0.80
49	6	8	5	4	36	60	0.60	0.50
50	6	7	7	1	38	60	0.63	0.50
51	10	8	2	8	28	6	0.47	0.80
52	6	5	6	4	33	60	0.55	0.10
53	8	6	6	6	37	60	0.62	0.20
54	4	6	4	4	28	60	0.047	0.20
55	5	7	5	6	32	60	0.53	0.10*
56	6	8	2	3	23	60	0.38	0.90*
57	6	6	4	2	20	60	0.33	0.60
58	7	8	6	7	43	60	0.72	0.20
59	9	7	3	6	38	60	0.63	0.70
60	7	4	3	6	26	60	0.58	0.20
61	7	6	2	2	25	60	0.42	0.90*
62	8	6	6	0	22	60	0.37	0.80
63	7	8	4	5	37	60	0.62	0.50
64	9	7	6	4	43	60	0.72	0.60
65	4	6	1	0	16	60	0.27	0.90*
66	6	7	4	4	35	60	0.58	0.50
67	10	8	4	5	38	60	0.63	0.90*
68	8	2	4	0	18	60	0.30	0.60
69	10	8	4	6	38	60	0.63	0.80
70	7	7	1	4	27	60	0.45	0.90*
71	4	6	2	2	22	60	0.37	0.60
72	10	6	4	4	34	60	0.57	0.80
73	8	8	6	4	38	60	0.32	0.10*
74	9	6	7	5	42	60	0.35	0.80
75	8	7	7	4	44	60	0.70	0.30
76	5	7	5	6	32	60	0.53	0.10*
77	7	8	4	3	39	60	0.63	0.80
78	5	7	5	6	32	60	0.53	0.10*
79	10	6	4	6	40	60	0.65	0.60
80	2	4	2	4	16	60	0.27	0.20

Final selection of items

Two criteria namely item difficulty index and item discrimination index were considered for the final selection of items of contribution test. In the present study, the items with P value ranged from 20 to 80 and discriminating index ranging from 0.20 to 0.80 were considered for the final selection of the items for contribution test. Haider (2001), Nagaraja and Sethurao (1996) also considered this range for item selection in their respective study. In this way 60 items which fulfilled both the two criteria were selected for the final format of the contribution test. The contribution scale included 10 questions on vegetable cultivation, 10 questions on post-harvest activities, 10 questions on poultry raising, 10 questions on livestock rearing, 10 questions on tree plantation and 10 questions on fish cultivation. Each of those questions was assigned a full weight of 2 score. Full score of 2 was given to a women for correct answer of each questions and '0' was assigned for wrong or no answer. However, partial score was given to partially correct answer to certain questions. Then, all the scores obtained by a women for her correct answers was added up to obtained her level of her contribution score. Thus, a women could obtain a total score of 120 for all her correct answers and '0' for all her wrong answers.

APPENDIX VI

Table 33. Inter- correlations between sixteen independent variables and six dependent variables (N = 200)

Variable	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅	X ₁₆	Y ₁	Y ₂	Y ₃	Y ₄	Y ₅	Y ₆	
X ₁	1.00																						
X ₂	-.217**	1.00																					
X ₃	-.187**	-.070	1.00																				
X ₄	.140*	-.713**	-.031	1.00																			
X ₅	-.183**	.541**	.108	-.687**	1.00																		
X ₆	-.050	.474**	-.062	-.188**	.174*	1.00																	
X ₇	-.276**	.525**	-.141*	-.330**	.229**	.370**	1.00																
X ₈	.953**	-.166*	-.144*	.097	-.136	-.025	-.245**	1.00															
X ₉	-.224**	.685**	-.027	-.465**	.496**	.383**	.311**	-.188**	1.00														
X ₁₀	-.180*	.840**	-.114	-.634**	.395**	.365**	.461**	-.156*	.559**	1.00													
X ₁₁	-.155*	.767**	-.236**	-.526**	.376**	.364**	.450**	-.140*	.485**	.891**	1.00												
X ₁₂	-.106	.640**	-.301**	-.408**	.251**	.316**	.413**	-.116	.403**	.717**	.847**	1.00											
X ₁₃	-.071	.665**	-.188**	-.441**	.390**	.415**	.477**	-.086	.503**	.689**	.780**	.842**	1.00										
X ₁₄	-.181*	.789**	-.060	-.589**	.375**	.334**	.503**	-.150*	.484**	.707**	.654**	.518**	.535**	1.00									
X ₁₅	-.282**	.476**	-.118	-.296**	.325**	.375**	.782**	-.250**	.316**	.292**	.329**	.284**	.371**	.519**	1.00								
X ₁₆	-.308**	.447**	-.129	-.376**	.391**	.259**	.609**	-.234**	.234**	.273**	.371**	.323**	.313**	.422**	.689**	1.00							
Y ₁	-.120	.613**	-.187**	-.426**	.336**	.374**	.377**	.066	.324**	.544**	.531**	.449**	.430**	.485**	.362**	.345**	1.00						
Y ₂	-.229**	.554**	-.027	-.380**	.373**	.323**	.293**	-.204**	.260**	.443**	.462**	.300**	.295**	.414**	.313**	.275**	.753**	1.00					
Y ₃	-.024	.393**	-.183**	-.206*	.175*	.382**	.288**	-.084	.230**	.299**	.313**	.339**	.352**	.333**	.252**	.209**	.540**	.530**	1.00				
Y ₄	-.026	.352**	-.047	-.238**	.344**	.321**	.247**	.003	.185**	.297**	.368**	.277**	.292**	.291**	.245**	.344**	.512**	.460**	.510**	1.00			
Y ₅	-.098	.209**	-.061	-.018	.223**	.312**	.123	-.073	.072	.014	.074	.007	.144*	.117	.215**	.146*	.310**	.442**	.350**	.327**	1.00		
Y ₆	-.081	.356**	.068	-.251**	.310**	.262**	.264**	.019	.150*	.233**	.259**	.177*	.205**	.233**	.230**	.234**	.448**	.391**	.172*	.228**	.584**	1.00	

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

- | | |
|--|--|
| <p>X₁ = Age</p> <p>X₂ = Education</p> <p>X₃ = Physical fitness</p> <p>X₄ = Family type</p> <p>X₅ = Family size</p> | <p>X₆ = Farm size</p> <p>X₇ = Annual income</p> <p>X₈ = Farming experience</p> <p>X₉ = Training exposure</p> <p>X₁₀ = Organizational Participation</p> |
| <p>X₁₁ = Individual extension contact</p> <p>X₁₂ = Group extension contact</p> <p>X₁₃ = Mass extension contact</p> <p>X₁₄ = Participation in decision making process regarding homestead agriculture</p> | <p>X₁₅ = Attitude towards homestead agriculture</p> <p>X₁₆ = Innovativeness</p> <p>Y₁ = Contribution in vegetable cultivation</p> <p>Y₂ = Contribution in post-harvest activities</p> <p>Y₃ = Contribution in poultry raising</p> <p>Y₄ = Contribution in livestock rearing</p> <p>Y₅ = Contribution in tree plantation</p> <p>Y₆ = Contribution in fish cultivation</p> |