

**HOUSEHOLD FOOD CONSUMPTION STATUS OF THE
RURAL FAMILIES OF JAMALPUR SADAR UPAZILA**

BY

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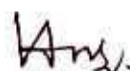
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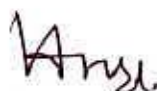
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*This is to certify that the thesis entitled, **Household Food Consumption Status of the Rural Families of Jamalpur Sadar Upazila** submitted to the faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE in AGRICULTURAL EXTENSION**, embodies the result of a piece of bona fide research work carried by **Nuid Mahmud**, Registration No. **05-01763** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.*

I further certify that such help or source of information, as has been availed of during the course of this investigation has been duly acknowledged by him.

Dated:
Dhaka, Bangladesh

(Professor Dr. Md. Rafiqueel Islam)
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***Dedicated To
My
Beloved Parents***

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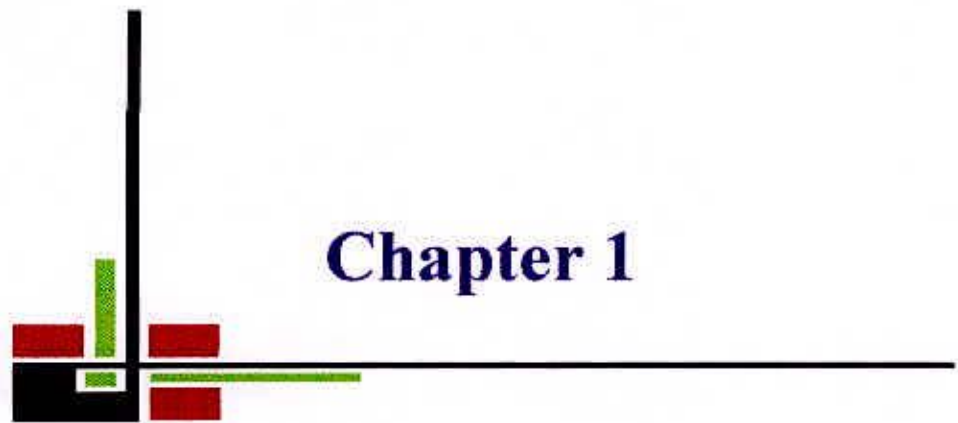
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ABSTRACT

The main objective of this study was to determine the household food consumption status of the farm families. Data were collected from a random sampling of 112 families out of 750 families in four selected villages of Sadar upazila of Jamalpur District. The data were collected through personal interviewing by using pre-tested structured questionnaire during 28 January to 15 February, 2013. Appropriate scales were developed and used to measure the concern variables. Household food consumption status was the predicted variable and the selected ten characteristics of the farm families constituted the experimental variable of the study.

The food consumption of the farm families was divided into three categories i.e, low food consumption families were 17 percent, medium food consumption families were 71.4 percent and high food consumption families were 11.6 percent. Among ten characteristics of the farm families, Family Education, Effective Farm Size, Annual Family Income, Knowledge on Agriculture, Innovativeness, Family Training Exposure, Agricultural Input Availability, Commercialization and Aspiration were positively correlated but only Family Size was negatively correlated. The characteristics *viz.* Effective Farm Size, Annual Family Income, Knowledge on Agriculture, Commercialization of the respondents showed significant correlation with their achievement of the household food consumption status. Considering the main focus of the study, it can be concluded that most of the farm families have medium food consumption status.



Chapter 1

Introduction

CHAPTER 1

INTRODUCTION

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1.1 Background of the Study

The food consumption of the large people of Bangladesh is directly related with the advancement of agriculture. Despite poverty reduction, betterment of standard of living and increasing the employment opportunity are also related with agriculture. Profitable, sustainable and eco-friendly agricultural system are inevitable to ensure long term food consumption of the people. The agriculture and the rural development sectors have been prioritized over other sectors to make Bangladesh self-sufficient in food within 2013. The government of Bangladesh is trying hard and soul to develop agricultural sector with the help of Sixth Five Year Plan, National Agriculture Policy and the Millennium Development Goals (MDG). The food production in Bangladesh has been raising condition since few last years. According to Bangladesh Bureau of Statistics, the crop productions will be 375.08 lac Metric Ton in 2012-2013 fiscal year. It was 348.85 lac Metric Ton in 2011-2012 fiscal year. The target of importing crops of the government will be only 11.77 lac Metric Ton in 2012-2013 fiscal year. The subsidy in agriculture was 12000 crore taka in 2011-2012 fiscal year to help the farmers by considering the increase of crop production. (Economic review 2013).



1.2 Statement of the Research Problem

The agriculture is a dominating sector in the economy of Bangladesh. Farmers play a vital role in this sector. When farmers remain in well condition then the production will increase. But this is a matter of great sorrow that they can hardly make both ends to meet. Ensuring food consumption and agricultural development in Bangladesh are almost similar. It is important to know the

household food consumption (HFC) status of farm families who produce food to feed the whole nation. Household food consumption depends on having financial, physical and social access as availability and stable that means food availability at the national level, regional level and stable and sustainable access at the local level were both considered essential to HFC. For many years the focus has been on food shortage and poverty as the main cause of food insecurity (Mahzabin, 2011). Food consumption is always analyzed in national level by comparing the availability and the requirement of food grains. But supply and requirement are not same. Therefore, it is important to understand that food security or consumption level is different family to family. However, to achieve desired agricultural production for gaining sustained food consumption, it is necessary to have a clear understanding about present HFC status of farm families. Hence, the researcher tried to find out answer of the following research questions.

1. What is household food consumption status of the farmers?
2. What is the relationship between existing characteristics of the farm families and household food consumption status?

1.3 Objectives of the Study

The present study has been carried out to fulfill the following specific objectives:

- i) To determine and describe following selected characteristics of the farm families
 1. Average family Education
 2. Family size
 3. Effective farm size
 4. Annual family income
 5. Agricultural Input availability
 6. Family knowledge on Agricultural
 7. Innovativeness
 8. Family Training Exposure
 9. Commercialization
 10. Aspiration

- ii) To assess the household food consumption status of the farm families.
- iii) To explore the relationship between characteristics of the farm families and their household food consumption status.

1.4 Scope and Significance of the Study

Now a days food consumption or security is worldwide discussed matter as well as in Bangladesh. The main point of sustainable development goal (SDG) is food consumption. Food consumption is an important thing to agricultural development of Bangladesh. Most of the people in our country depend on agriculture. The contribution of GDP is estimated 18.70% in Economic Review 2013. When 60% of the total labour forces in Bangladesh involves in agriculture. Although food consumption or security is not concern only for having enough production, it is also for having an equal chance of access to food for all. There is enough food in the world but equal distribution is not occurring also in Bangladesh. The recent increased food price has worsened the situation and millions of people had fallen under poverty line. At the same time Bangladesh is struggling to combat poverty and hunger. The findings of the present study, in particular, will be applicable to the four villages of sadar upazila Under Jamalpur district. However, these findings may also have applications for other rural areas of the country having similar physical, socio-economic, cultural and geographical conditions to the study area. A finding of the study is more significance to the policy makers, particularly planners for preparation of future program on food consumption.

1.5 Justification of the Study

Governments of developing countries are more aware that they have a major responsibility for rural development i.e. food consumption, but lack the capacity and solutions to meet the challenge. In 1996, the world's heads of state meeting in Rome committed their countries to eradicate hunger and reduce the number of under nourished people by 50 percent by the year 2015 (FAO, 2000). We had enough food so that there was no scope to study food

consumption in Bangladesh as well as the world. There is a little work or research in our country widely. The Researcher seems that the findings of the research is helpful to the policy maker in our country to make appropriate policy and give the security for the consumption of food and equal distribution of food to the people. It is especially on eradication of hunger, malnutrition of the target group.

1.6 Assumptions

The researcher had the following assumptions in mind while undertaking this study.

1. The respondents selected for the study were competent enough to answer the queries made by the researcher.
2. The respondents included in the sample were capable of furnishing proper responses to the questions included in the interview schedule.
3. The views and opinions provided by the farm families included in the sample were the representative views and opinions of all farm families of the study area.
4. The data collected by the researcher from the respondents were free from biases.
5. The items, questions and scales used for measuring the variables were reasonably adequate to reflect the respondents' real views and opinions.
6. The data for the study were valid and reliable.
7. The findings of the study were expected to be useful for planning and implementation of various extension programs for improving HFC status of the country.

1.7 Limitations of the Study

Considering the time and other necessary resources and also to make the study manageable and meaningful, it became essential to impose certain limitations as mentioned below:

1. The study was confined to a selected area *i.e.* Mollahpara, Kalaboho, kachasora, Mongolpur Villages under sadar upazila of Jamalpur district.
2. There were many characteristics of the farm families but only ten characteristics of them were selected for the study.
3. The researcher depended on the information furnished by the respondents while interviewing.

1.8 Definition of Key Terms

The key terms which have been used throughout the thesis are defined and interpreted below:

Household: A group of persons who live in the same dwelling and eat meals together is termed as household.

Food: It is the material that provides living things with the nutrients. It essential for better energy and growth.

Food consumption: Food consumption is the proper biological use of food and requiring a diet providing sufficient energy. Effective food consumption depends in large measure on knowledge within the household of food storage and processing techniques, basic principles of nutrition, proper childcare and illness management.

Food security: Exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

Household food security: Household Food Security has been defined by Food and Agriculture Organization of the United Nations (FAO) as the economic,

physical and social capacity of a household to continually provide family members with sufficient food for individual bodily needs without threats of shortage. Three dimensions of the FAO household food security program are: availability, access and stability.

Annual dietary needs of family: It may be defined as the total calorie needed by all of the family members at the rate of 40 kcal per day per kg body weight.

Average family education: Education of an individual was defined as the extent of formal education received by an individual from the educational institute or adult learning center. Family education was measured by adding the educational scores of the family members. Average family education is measured by the sum of educations of the family members except the members who are below six years old and divided by the members.

Family Size: Family size was defined as the number of individual in the family including family head and other dependent members who lived and ate together.

Annual family income: Annual family income was defined as the total financial return per year of a family from farm (crops, livestock, poultry and fish) and non-farm sources (service, business, selling labor, bank interests, remittance, financial help from relatives etc.).

Effective farm size: Effective farm size of a respondent referred to the area of homestead, farm area and surrounding areas used for vegetables garden, fruit trees, pond, cattle, goat rearing etc.

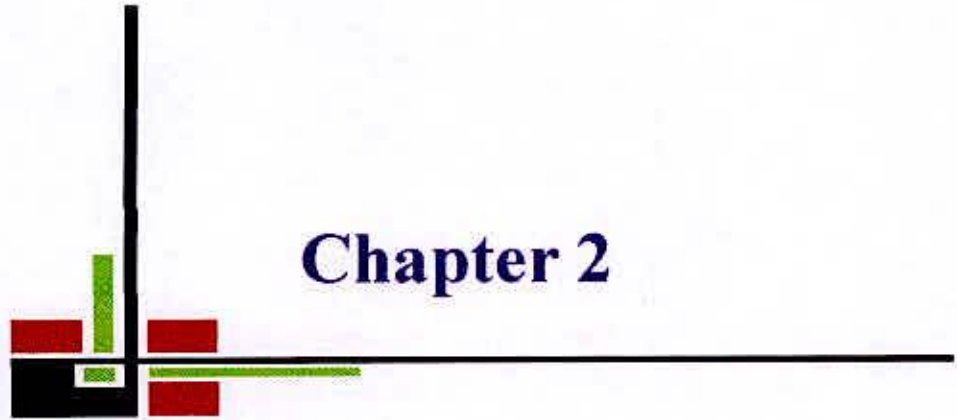
Family knowledge on agriculture: Literally knowledge means knowing or what one knows about a subject, fact, person etc. Knowledge on agriculture referred to farmers' understanding of the facts, phenomena and methods in different aspects of agriculture. Family knowledge on agriculture is measured

by asking questions to the members who are present at the time of interviewing.

Innovativeness: It is the degree to which an individual adopts new farming practices relatively earlier than others within a specific locality.

Commercialization: Commercialization of an individual referred to the ratio of value of crops sold and total value of crops raised. It was expressed in percentage.

Aspiration: According to Haller (1968), an aspiration usually refers to a person's or a group of persons' orientation towards a goal. In the present study aspiration of an individual has been defined as the standards set by himself regarding the level he wanted to achieve with future performance.



Chapter 2

Review of Literature

CHAPTER 2

REVIEW OF LITERATURE

This Chapter contains the pertinent literatures relevant to the household food consumption status. Very few researches, especially regarding the household food consumption status have been carried out in different countries of the world. Besides, it was a preliminary investigation in this regard. However, pertinent literatures from related articles and websites have so far been documented in this Chapter.

2.1 Literature Related to Household Food Consumption

Low food consumption is a complex, multidimensional phenomenon which varies through a continuum of successive stages as the condition becomes more severe. Each stage consists of characteristic conditions and experiences of food insufficiency to fully meet the basic needs of household members and of the behavioral responses of household members to these conditions. A variety of indicators is needed to capture the various combinations of food conditions, experiences and behaviors that, as a group, characterize each such stage which were published in 1990 by the Life Sciences Research Office (LSRO) of the Federation of American Societies for Experimental Biology. Food consumption- "Access by all people at all times to enough food for an active, healthy life. Food consumption or security includes at a minimum: (1) the ready availability of nutritionally adequate and safe foods and (2) an assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing or other coping strategies)."

Definitions on food consumption or security, provided by different Authors, have a common emphasis. The most commonly accepted definition of the food

security was given by Reutlinger (1987). He defined food security as access by all people at all time to enough food needed for an active and healthy life. Its essential elements are the availability of food and the ability to acquire it.

According to USAID (2008), there is a food consumption or security when all people at all times have sufficient physical and economical access to safe and nutritious food to meet their dietary needs including food performances, in order to live a healthy and active life.

Fairbrain *et al.* (1997), household food consumption or utilization is a complex sustainable development issue, linked to health through malnutrition, but also to sustainable economic development, environment and trade.

Sharma (1992), a household is food secured when it is both physical and economical access to adequate food for all its members and when it is not at undue risk of losing such access. Household food security is a year round access to inadequate supply of nutritious and safe food to meet the nutritional needs of all household members (IFAD, FAO and WFP, 2000).

At national level food security or consumption mean the availability in the country of sufficient stocks of food to meet domestic demand until such time as stocks can be replenished from harvests or imports. At household level, it means that all members including, women and children, have access to food as they need, either from their own production from market or from government's transfer mechanism. However even when national food consumption is achieved individuals and groups in the country can still go hungry because they do not have the means to access food (IRRI, 2006).

Webb *et al.* (2002) stated that physical availability of food underscores the significance of production in order to supply enough food for all people at all times. The production component encompasses farm production and non-farm production. Farm production is noted by generic indicators such as area cultivated, crop yield, crop diversity, number of cropping seasons and access to



and use of inputs. There are several factors that mediate the process of attaining food availability, food access and food utilization is an attempt to achieve food security as shown in Figure 2.1.

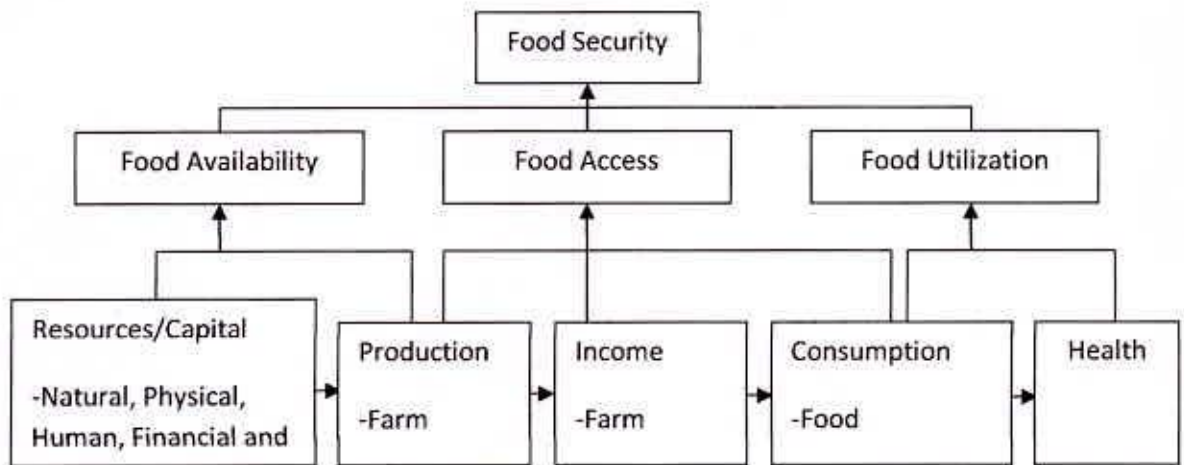


Figure 2.1 Conceptual framework of food security (Webb *et al.*, 2002:14)

Gopalan (2000) indicated that a comprehensive food based approach towards achieving household nutrition security (including micro-nutrient adequacy) is, in effect, a 'people's movement'. The corner stone's of this movement are self-help, self-reliance, effective mobilization and optimal utilization of locally available food resources.

Fisseha (1987) stated that the growing dependence of rural people on off-farm employment suggests that the potential for linking tree products with off-farm employment and income creation probably also. Small rural processing enterprises based on wood and other tree and forest products are one of the largest sources of off-farm rural employment.

Frankenberger (1992) mentioned that worsening lack of food consumption came to be viewed as an evolving process in which the victims were not passive to its effects. Social anthropologists observed that vulnerable populations exhibited a sequence of responses to economic stress, giving recognition to the importance of behavioral responses and coping mechanisms in food crises.

Hamilton *et al.* (1997) stated that the full range of food insecurity and hunger cannot be captured by any single indicator. Instead, a household's level of food insecurity or hunger must be determined by obtaining information on a variety of specific conditions, experiences and behaviors that serve as indicators of the varying degrees of severity of the condition. Responses to individual items in this supplement are not, taken alone or in themselves, meaningful measures of food insufficiency, food insecurity or hunger and should not be used in such a manner.

Maxwell and Frankenberger (1992) concluded that the household livelihood consumption or security model allows for a broader and more comprehensive understanding of the relationships among the political economy of poverty, malnutrition and the dynamic and complex strategies that the poor use to negotiate survival. The model places particular emphasis on household actions, perceptions and choices. Food is understood to be only one of the priorities that people pursue. People are constantly required to balance food procurement against the satisfaction of other basic material and non-material needs.

Maxwell and Smith (1992) indicated that the focus on food and nutritional security as they were currently conceived needed to be broadened. It was found that food security is but one subset of objectives of poor households; food is only one of a whole range of factors that determines why the poor take decisions and spread risk and how they finely balance competing interests in order to subsist in the short and longer term.

Maxwell and Smith (1995) stated that not all households are equal in their ability to cope with stress and repeated shocks. Poor people balance competing needs for asset preservation, income generation and present and future food supplies in complex ways.

Jones and Parikh (1998) found that in Bangladesh, short- and long-term wage effects are different and policy, in promoting the growth of agriculture, should

mitigate against short-run food insecurity amongst the landless poor and marginal farmers who are generally the poorest section of society.

Maxwell (1995) stated that the concept of food consumption is based on three distinct yet inter-related fundamental concepts: food availability, food access and food utilization. These concepts together determine the food consumption status at any level of analysis.

Sen (1981) found on food entitlement had a considerable influence on this change in thinking, representing a paradigm shift in the way that famines were conceptualized. Households derive food entitlements from their own production, income, gathering of wild foods, community support (claims), assets, migration, etc. Thus a number of socio-economic variables have an influence on a household's access to food.

Saxena and Farrington (2003) found that India shows agricultural labor wage rates rising at a rate of 3 percent per annum during the 1970s and 1980s.

Stringer (2001) mentioned that the cultural and social association of cash crops and large livestock to men's control while subsistence food crops and small livestock as being in women's domain illustrates how food consumption as a gendered concept.

Thrupp (1998) stated that household food consumption by small farmers is actually dependent on a rich diversity of biological resources and management of these resources.

Watson *et al.* (1998) revealed that all adverse impact on the household livelihood food security of the small farmers depends on natural resources. Diversification and land degradation leading to intensive population pressure and improper resources use that degrade land, reduce its productivity, decrease food security and health prospects, increase poverty and increase pressure for large scale migrations.

Webb *et al.* (2002) reported that household consumption consists of expenditure on both food and non-food items that are enhanced by an increase in household income. Aspects relating to consumption, such as number of meals per day, access to clean water, dietary diversity, food prices, food quality, food taboos and share of non-food expenditure (e.g. education and health services) are crucial in mediating food utilization.

Wickens *et al.* (1986) estimated that 75 percent of the tree species (7,000-10,000) of tropical Africa are used as browse. Fodder trees contribute in several ways to the overall food consumption of households: they make a significant contribution to domestic livestock production which in turn influences milk and meat supply.

Wold *et al.* (1998) stated that lack of standards and a form of regulation of actors in the market system has led to an increase in buyers cheating and swindling small-scale farmers of their resources. As a result farmers feel that the statistic policies are appropriate policies because of government institutions and agencies provided reliable market and agricultural support systems at their door steps.

World Bank (1989) reported that the household firstly involved the household's access to resources for food. This is the path from production or income to food. The second process involves translating the food obtained into satisfactory nutritional levels.

Borton and Shoham (1991) found that adequate food availability at the national level did not automatically translate into food consumption at the individual and household levels. Researchers and development practitioners realized that food unconsumption occurred in situations where food was available but not accessible because of erosion to people's entitlement to food. "Entitlement" refers to the set of income and resource bundles (e.g. assets, commodities) over which households can establish control and secure the consumption of their livelihoods.

Ellis (2000) stated that household food consumption by the small farmers requires attention to assets, access and activities. A key theme is diversification and in turn, livelihood diversification can be analyzed through several dimensions: extent of diversification, poverty and income distribution, agriculture, environment, gender, and macro policies and reform. Diversification, as such can have positive effects: it takes advantage of seasonal variation in labor requirements, and can lead to risk reduction, higher income, asset improvement, and environmental improvement. Conversely, it can have disadvantages in terms of income distribution, farm output, and adverse gender effects.

Chambers (1989) found that the risk of livelihood failure determines the level of vulnerability of a household to income, food, health and nutritional insecurity. Therefore, livelihoods are secure when households have secure ownership of or access to, resources and income earning activities, including reserves and assets, to offset risks, ease shocks and meet contingencies.

Dev (1998) provided that more evidence from India and suggests that 12 percent increases in agricultural productivity led to 125 percent increases in average incomes of the landless. Agricultural development also generates new and better-paid jobs off-farm for the poor through linkages between agriculture and the wider rural economy. The combination of extra jobs within and outside farming can have strong effects on rural labor markets, pushing up wages and improving the ability of the poor to buy food.

Devereux (2000) mentioned that less directly, hunger and food insecurity may force people to undertake risky activities (e.g. prostitution, crime or migration) in a desperate bid to find food and work. Frequently, where mass migration takes place, it is the spread of diseases like measles and diarrhea that leads to mortality, rather than hunger directly.

DFID (2004) stated that the contribution of household production to food consumption is based on two assumptions. First, it is assumed that an increase

in agricultural production would increase the physical availability of food from own household production as well as increase physical availability of food in markets at affordable prices for the poor. Secondly, increased agricultural production would provide jobs and increase household income to enhance economic access to food.

Drinkwater and McEwan (1992) defined household livelihood consumption as adequate and sustainable access to income and resources to meet basic needs (including adequate access to food, potable water, health facilities, educational opportunities, housing, time for community participation and social integration). Livelihoods can be made up of a range of on-farm and off-farm activities which together provide a variety of procurement strategies for food and cash. Thus, each household can have several possible sources of entitlement which constitute its livelihood. These entitlements are based on the household's endowments and its position in the legal, political and social fabric of society.

Radimer *et al.* (1990) and Hamilton (1997) stated that qualitative research with low-income households in America provided insight into the following ways that households experience food insecurity (access). Feelings of uncertainty or anxiety over food (situation, resources, or supply);

- Perceptions that food is of insufficient quantity (for adults and children);
- Perceptions that food is of insufficient quality (includes aspects of dietary diversity, nutritional adequacy, preference);
- Reported reductions of food intake (for adults and children);
- Reported consequences of reduced food intake (for adults and children);
- and
- Feelings of shame for resorting to socially unacceptable means to obtain food resources.

Maxwell and Smith (1992) found that livelihood promotion involves improving the resilience of household livelihoods so that food and other basic needs can be met on a sustainable basis (i.e. development). Interventions of this type often aim to reduce the structural vulnerability of livelihood systems by focusing on:

- improving production to stabilize yields through diversification into agro-ecologically appropriate crops and natural resource management measures (e.g. soil and water conservation);
- creating alternative income-generating activities (e.g. activities to develop small enterprise);
- reinforcing coping strategies that are economically and environmentally sustainable (e.g. seasonally appropriate off-farm employment);
- improving on-farm storage capacity to increase the availability of buffer stocks;
- Improving common property management through community participation.

2.2 Literatures Related to Relationship between Selected Characteristics of the Respondents with their Food Consumption Status

2.2.1 Average Family Education and Household Food Consumption Status

Nigussie (2008) found that educational status of the household family is important to affect how money spends efficiently. Sufficient amount of income is a precondition to attain food consumption but not an end by itself, when it is supported by education there will be better management of the available income and efficient utilization, which in turn paves the way to have food consumption.

Haile *et al.* (2005) in their study revealed that education was found to have a positive relationship with household food consumption. They found that educated family is more secured than uneducated family.

Hasan (2006) stated that the education made the largest contribution of wealth accumulation and primary education had an effect on poverty alleviation.

Mahzabin (2011) stated that education and household food security have a positive relationship.

2.2.2 Family Size and Household Food Consumption Status

Maharjan and Khatri-Chhetri (2006), Paddy (2003) and Mahzabin (2011) found a negative correlation between household or family size and food consumption as food requirements increase in relation to the number of persons in a household.

Haile *et al.* (2005) found in their study that household or family size has a negative and significant relationship with the probability of food consumption.

2.2.3 Effective Farm Size and Household Food Consumption Status

Haile *et al.* (2005) found in their study that farm size is positively and significantly related to the probability of a household being sufficient food for consumption.

Shiferaw *et al.* (2003) observed in their study that the farm size of the food secure households is significantly larger than the low food consumption or food insecure households.

Mahzabin (2011) observed in her study that there is a positive and significant relationship with farm size and household food security status.

2.2.4 Annual Family Income and Household Food Consumption Status

Jacob (2009) found that low-income household is more likely to suffer food shortages than a wealthier household.

Babatunde *et al.* (2007) found that the higher annual family income, the higher is the probability that the household would food for consumption.

Mahzabin (2011) found that there is a positive relationship between Annual family income and household food security (consumption basis) status.

2.2.5 Agricultural Input Availability and Household Food Consumption Status

No literature was found on relationship between agricultural input availability and their food consumption status.

2.2.6 Family knowledge on Agriculture and Household Food Consumption Status

Moira Gundu (2009), the main findings of this study support the view that women play an active role in food production but their potential is limited by inadequate levels of literacy that affect the way they access and utilize resources for sustainable agriculture and household food consumption among other factors. This may be generalized to the situation of female farmers in Zimbabwe. Improved literacy competencies among the female farmers in Zimbabwe lends itself as one of the interventions that may assist in improving access to information and its effective utilization.. This calls decision-makers to boost literacy for women, develop available agricultural information resources and harness effort towards making them accessible.

2.2.7 Innovativeness and Household Food Consumption Status

No literature was found on relationship between innovativeness and their food consumption status.

2.2.8 Family Training Exposure and Household Food Consumption Status

No literature was found on relationship between family training exposure and their food consumption status.

2.2.9 Commercialization and Household Food Consumption Status

Linlin Fan (2012) found that market liberalization increases agricultural production and commercialization. Agricultural commercialization significantly increases nutrition overall, and especially increases nutrition and food consumption. He also found that commercialization of field crops and horticulture increases nutrition.

2.2.10 Aspiration and Household Food Consumption Status

No literature was found on relationship between aspiration and their food consumption status.

2.3 Conceptual Framework of the Study

Agriculture continues to be an important sector of gross domestic product (GDP) of Bangladesh. It of course contributes not only food and fiber for the population but also provides employment and livelihood options and vital foreign exchange for socio-economic development. However, farmers have remained largely an invisible factor in the development process. They mainly depend on crops for their household food consumption. The first and foremost

constraint of the farmers is poverty and land inadequacy. This problem has severely limited farmer's capacity as productive members of the rural community. It is also the main cause of low social and economic status of farmers. Their low literacy levels and limited educational attainment are to some extent other outcomes of poverty. These contribute to ensure the much more limited access of farmers to employment and income opportunity. It is clear that for farmers to become better food producers their economic empowerment is necessary. This would enable them to participate more effectively in the planning and decision-making process that is important for improving their productivity.

In this study, it was expected that household food consumption status as predicted variable which would be influenced by selected characteristics *viz.* average family education, family size, effective farm size, annual family income, agricultural input availability, family knowledge on agriculture, innovativeness, family training exposure, commercialization and aspiration of the respondents' family as experimental variables. However, for more clear understanding of the present study, a conceptual model has been presented in Figure 2.2. The solid one-way arrows indicate the cause-effect relationships which have been observed and broken one-way arrows indicate the relationships which have not been measured in the present research work.



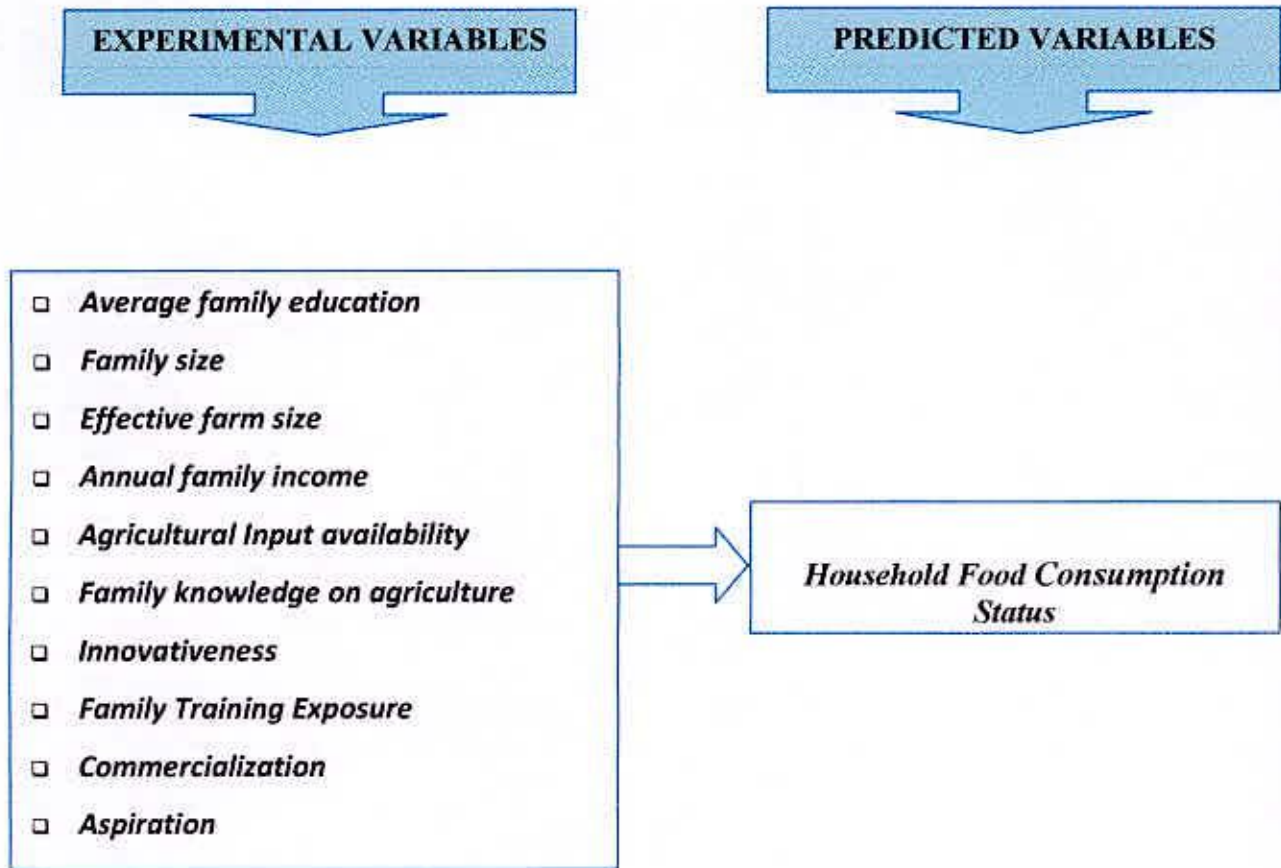
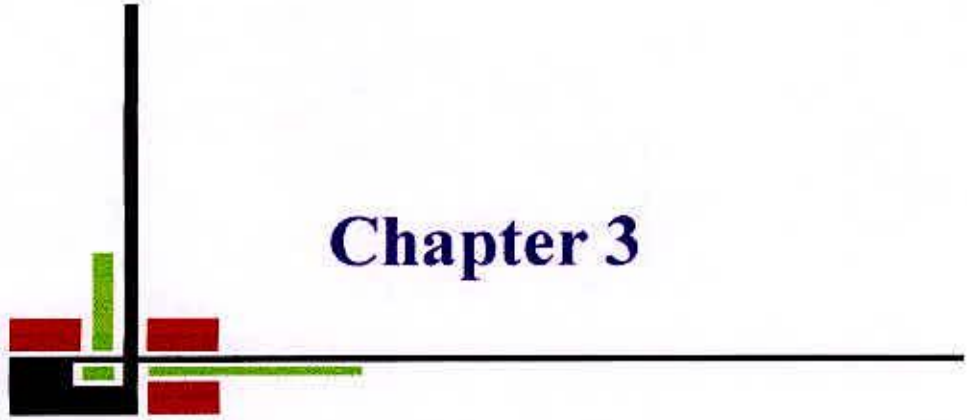


Figure 2.2 Experimental and predicted variables of the study



Chapter 3

Methodology

CHAPTER 3

METHODOLOGY

This chapter gives a scientific and logical methodology for different stages of carrying out the research and description of the design and conduct of a survey to collect necessary data. Methods and procedures that were followed are discussed below:

3.1 Research Design

A research design helps the researcher to answer the questions of the research objectively, accurately, economically as possible. It sets up a framework for the test of relationship among the variables and helps to keep research in proper direction (Ray and Mondal, 2004).

3.2 Study Area

The aim of the study was to ascertain the household food consumption status of farmers. For selecting study area preliminary visits were made and finally the study was conducted in Mollahpara, Kalaboho, kachasora, Mongolpur villages under sadar upazila of Jamalpur district.

3.2.1 Rationale for the research site

The soil fertility status is not suitable for agriculture crop production. There are some reasons such as Modhupur hilly area is the south of sadar upazila and the char land as well as breaking of the bank of the river Brahmapura. Sadar upazila is identified as moderate food unconservative area. Over all these four villages have good communication facilities from Jamalpur sadar and researcher himself was familiar with language of the people of the study area.

For better understanding a map of Jamalpur district showing different upazila and another map of sadar upazila showing the study area have been present in figure 3.1 and figure 3.2 respectively.



Figure: 3.1. Map of Jamalpur District

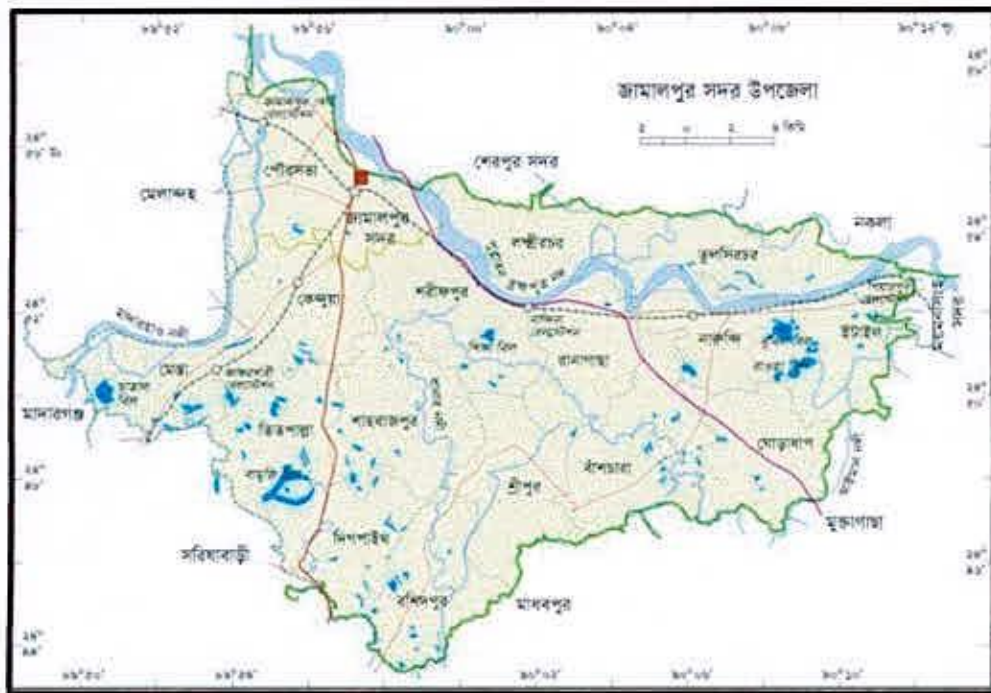


Figure: 3.2. Map of Jamalpur Sadar upazila

3.2.2 Basic features of the study area

Total families of the village Mollahpara, Mongolpur, kalaboho and kachasora are 210, 305, 320 and 285 respectively. Most of the houses of those four villages are “Adha Paka”. Literacy level is not up to the mark. Most of the people of those villages earn their livelihood from farming activities and business. About 70% of the families are engaged in Agriculture.

3.3 Population Sample of the study

An updated list of all the farm families of the selected villages was prepared by the help of SAAO of DAE. There were a total of 750 farm families in the four selected villages related to agriculture which was considered as the population of the study. A total of 112 farm families were constituted as the sample of the study by taking proportionately 15% of farm families of the villages with the help of random sampling method.

3.4 The research Instrument and Preparation

A structured interview schedule was prepared on the basis of the objectives of the study to collect the relevant data. The questions and statements contains in the schedule were simple, direct and easily understandable.

Both open and close formed questions were used in the schedule. There were also some scales in the schedule. The draft interview schedule was pre-tested among the 20 farmers from the study area. It helped the researcher to identify the faulty questions in the draft schedule and the necessary correction, modification, adjustment, deletion and addition were made. An English version of interview schedule has been attached in *Appendix A*.

3.5 Method of data collection

In a social science research, the selection of variables required a careful consideration and comprehensive search. Selection and measurement of variables are important tasks. Considering the objectives, review the available literature and discussing with experts and researchers in the relevant field the researcher constituted the primary basis for selecting the variables of the study. "Household food consumption status" of the farm families Sadar upazila under Jamalpur district was the main focus of the study and considered as a predicted variable. The characteristics of the farm families i.e. average family education, family size, effective farm size, annual family income, agricultural input availability, family knowledge on agriculture, innovativeness, family training exposure, commercialization and aspiration were considered as the experimental variables of the study.

3.6 Measurement of variables

3.6.1 Measurement of experimental variables

The selected characteristics of the selected farm families of the study were average family education, family size, effective farm size, annual family

income, agricultural input availability, family knowledge on agriculture, innovativeness, family training exposure, commercialization and aspiration. Procedures followed for measuring each of these characteristics are described below:

3.6.1.1 Average family education

Education was measured in terms of one's year of schooling. One score was given for passing each level in an educational institution (Amin, 2004). For example, if a individual passed the SSC examination, educational score of that individual was given as 10. If a individual did not know how to read and write, his educational score was given as '0'. Then, average family education of a family was measured by the following formula:

$$AFE = \frac{\text{Sum of education score of all family members}}{\text{No. of family members above six years}}$$

AFE means average family education.

This variable appears in the item no. 1 in the interview schedule (Appendix-A).

3.6.1.2 Family size

The family size was measured by the total number of members in the family. The family members included family head and other dependent members like husband/wife, children, etc. who lived and ate together. A unit score was assigned for each member of the family. If a respondent had five members in his/her family, his/her family size score was given as 5 (Khan, 2004). This variable appears in the item no. 1 in the interview schedule (Appendix-A).

3.6.1.3 Effective farm size

Farm size of respondents was determined as the total area of his farm on which he continued his farming operation during the period of this study. It included as area of farm owned by him as well as those obtained from other by rented in, lease or other means. The farm size of a respondent was measured in hectares by using the following formula:

$$FS = A_1 + A_2 + \frac{1}{2} (A_3 + A_4) + A_5$$

Where,

FS = Farm size

A₁ = Homestead area

A₂ = Own land under own cultivation

A₃ = Area taken by a respondent from other for cultivation on rental (borga) System

A₄ = Area given by a respondent to others for cultivation on rental (borga) system

A₅ = Cultivable area taken as lease/mortgagee by a respondent from others

3.6.1.4 Annual family income

Annual income referred to the total financial return of a household from farm (crops, livestock, poultry and fish) and non-farm sources (business, job, remittance and others) in one year. It was expressed in Taka. In measuring this variable, total earning in Taka of a respondent was converted into score. A score of one was given for every 1000 Taka (Waheduzzaman, 2004). This variable appears in the item no. 3 in interview schedule (Appendix-A).

3.6.1.5 Agricultural Input availability

Agricultural input availability is measured by the degrees of availability of agricultural inputs like seeds, fertilizer, pesticide, farm implements and irrigation facilities. The family members were asked to indicate their responses

regarding the degree of availability of each five selected inputs with four alternate responses as highly available, moderately available, poorly available and not at all available with the assigned score as 3, 2, 1 and 0 respectively. Finally agricultural input availability score of the family was measured by the adding of the scores from all the five (5) items. Thus, the possible range of agricultural input availability could be 0-20, while 0 indicates no agricultural input availability and 20 indicates highly agricultural input availability.

3.6.1.6 Family knowledge on agriculture

Agricultural knowledge of a family was measured by asking 20 selected questions to the any family members related to various components of agriculture. A full score of 2 (two) was assigned for each correct answer and zero (0) for no or wrong answer. Partial score was assigned for each partial correct answer. However, for correct responses to all the questions, a family could get a total score of 40, while for wrong responses to all the questions a family could get '0'. As such, '0' indicates having very low agricultural knowledge and 40 indicates very high agricultural knowledge.

3.6.1.7 Innovativeness

Innovativeness is the degree to which an individual adopts an innovation relatively earlier than other members in the social system (Rogers, 1995). The term innovativeness refers to the degree to which an individual is relatively earlier in adopting new ideas than the other members of a social system (Rogers, 1995). Innovativeness of the respondents was measured on the basis of their adoption of 10 agricultural innovations. Score was assigned on the basis of earliness in use of five point scales as follows:



Score 4	= use of technologies within one year after hearing
Score 3	= use during one to two years after hearing
Score 2	= use during two to three years after hearing
Score 1	= use after three years of hearing
Score 0	= never used

Thus, the innovativeness score of a respondent was obtained by adding the score for all ten items. The range of innovativeness score could vary from 0 to 40, where 0 indicates no innovativeness and 40 indicates very high innovativeness.

3.6.1.8 Family Training Exposure

Family training exposure was measured by the total number of days the members of the family received training on different subject matters in their life.

3.6.1.9 Commercialization

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

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

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

3.6.1.10 Aspiration

According to Haller (1968), an aspiration usually refers to a person's or a group of persons' orientation towards a goal. Muthaya (1971) developed 12-item 'Aspiration ratings for the present and future'. Sagar (1983) constructed a 13-item aspiration scale in his study by picking up 12 items from Muthaya's scale. Islam (2000) used 9 items with slight modification from Sagar's scale. Ali (2008) constructed a 10-item aspiration scale by picking up 8 items from Islam's (2000) scale with some modification. The scale of Ali (2008) was used in the study for determination of family aspiration. To have clear responses from the farm families, the items (statements) were provided with 5-point response categories weighted from 0 to 4 indicating low to high level of aspiration. Level of aspiration score of a family was determined by adding the score for responses to all the items in the scale. Therefore, total score of a family could range from 0 to 40, while 0 indicating no aspiration and 40 very high level of aspiration.

3.6.2 Measurement of household food consumption status

Household food consumption (HFC) status was the main focus and predicted variable of the study. The HFC status was determined by using the consumption approach. Consumption is preferable to measure HFC than income because it is less vulnerable to seasonality and life cycle, less vulnerable to measurement errors because respondents have less reason to lie, it is closer to the utility that people effectively extract from income and for the poor most income is consumed (FAO,2002).

Food consumption status of the family was measured with the following steps:

First step: The requirement of food for adult male of 19-59 years is 2318 kcal/day/person as suggested by HIES (2010). The requirement of food can vary by age and sex. Food requirement of a family member was determined by multiplying the conversion factor (Appendix-B) by age and sex as suggested by World Bank (1986) with 2318 kcal/day/person. Then the food consumption of

the family per day was determined by the adding of food requirements of all the members of the family. Then the weekly requirement of food of the family was determined.

Second step: The family members were asked to indicate their consumption of different food items in a week. Calories for each food items was determined by using the calorie content table as suggested by World Bank (1986) and shown in Appendix-C. Then the total calorie consumption of the family in a week was determined by the addition of the calories of all consumed food items.

Third step: Food consumption of the family was determined by using the following formula:

$$\text{Food consumption status} = \frac{\text{Consumed calories}}{\text{Required calories}} \times 100$$

Thus, the possible range of food consumption status of a family could range from 0-100, while '0' indicates no food consumption status and 100 indicates medium food consumption status and above 100 indicates high food consumption status.

Question on these characteristics appears in item no. 10 in the interview schedule (Appendix A).

3.7 Data collection

Before finalizing the data collection instrument i.e. interview schedule, it was pre tested in actual field situation in order to bring its appropriateness during data collection. However, the empirical data were collected during 28 January to 15 February, 2013. Four villagers of the selected villages helped the researcher to introduce him with the farm families. The researcher first established rapport with the family members and then clearly explained the objectives of the study as far as possible. As a result, the respondent furnished proper responses to the questions and queries without any hesitation. The respondent and family members were very much cooperative during the period of data collection.

3.8 Validity, Reliability and Ethical Measures

The researcher made consultation with extension scientists and field workers to maintain validity of the research instruments. The success of the research depends not only on the validity of the research but also on the reliability of data. The respondents did not keep records of the daily food consumption. Sometimes it was difficult to collect the actual data and the researcher had to rely on the memory of the respondents. The respondents were treated with great respect and interviewed at their leisure time so that they could give accurate information. Their privacy, confidentiality and nonjudgmental views were considered during collection of data. Questions were asked systematically and explanation was done whenever it was felt necessary. The information supplied by the family members was recorded directly in the interview schedules. The information was checked carefully before leaving the study area. In order to minimize errors data were collected in appropriate standard units.

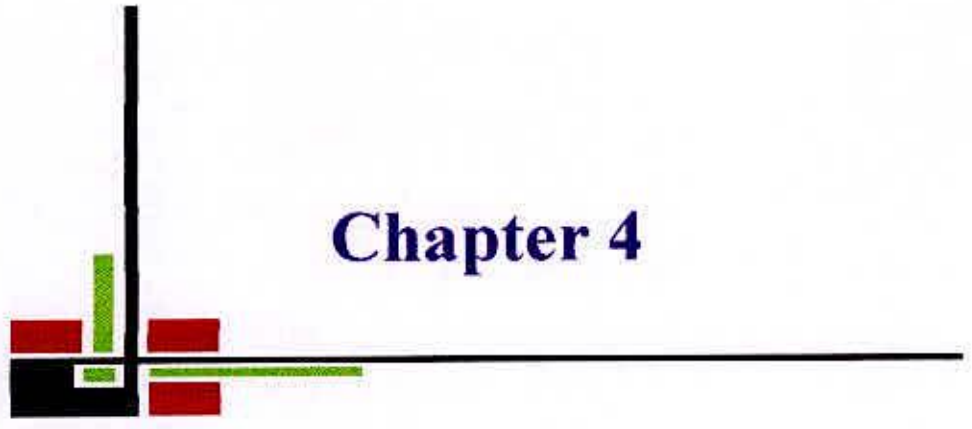
3.9 Data Analysis

At the end of data collection all the responses from the farm families of the interview schedule were given numerical coded values. Qualitative data were converted into Quantitative one whenever necessary. Data obtained from the respondents were compiled to a master sheet, then tabulated and analyzed in accordance with the objectives of the study. SPSS (Statistical Package for social science) computer program was used to process all collected information in computer. Descriptive statistical methods like range, mean, percentage distribution and standard deviation were used. In order to test hypotheses of the study Pearson's Moment Correlation co-efficient (r) was used.

3.10 Hypotheses of the study

Research hypothesis: There is a relationship between each of the characteristics of the farm families and their household food consumption status.

Null hypothesis: There is no relationship between each of the characteristics of the farm families and their household food consumption status.



Chapter 4

Findings And Discussion

CHAPTER 4

FINDINGS AND DISCUSSION

The findings of the study and interpretations of the results have presented in three sections of this chapter according to the objectives of the study. The first section deals with the selected characteristics of the families while the second section deals with the household food consumption status. In the third section, the relationships between the household food consumption status and the selected characteristics of farm families have discussed.

4.1 Selected characteristics of the farm families

The selected characteristics of the farm families were average family education, family size, effective farm size, annual family income, agricultural input availability, family knowledge on agriculture, innovativeness, family training exposure, commercialization and aspiration. The salient features of these characteristics like measuring unit, possible range, observed range, percent, mean and standard deviation of the farm families are presented in Table 4.1 and described below:

4.1.1 Average family education

Average family education of the farm families ranged from 0-15, the average being 7.27 with a standard deviation of 2.44. The families were classified into three categories on the basis of their average family education as follows:

Table 4.1 Categorization of average family education

Categories	Basis of categorization
Low average family education	$< \text{Mean} - 0.5 \text{ sd}$, i.e., < 6.050
Medium average family education	$\text{Mean} \pm 0.5 \text{ sd}$, i.e., $6.051 - 8.49$
High average family education	$> \text{Mean} + 0.5 \text{ sd}$, i.e., > 8.50

According to the classification, the low average family education was 25.9%, the medium average family education was 52.7% and high average family education was 21.4%. Data presented in Table 4.2 indicated that half of the respondent's families had medium average family education.

Table 4.2 Farm families characteristics profile

Characteristics	Measuring unit	Possible range	Observed range	Categories	Number (N = 112)	Percent 100%	Mean	Standard deviation
Average Family Education	Score	-	0-15	Low family Education (upto 6.050) Medium family Education (6.051-8.49) High family Education (8.50-above)	29 59 24	25.9 52.7 21.4	7.27	2.44
Family size	Number of Members	-	2-9	Small (2-4) Medium (4-6) Large (7 and above)	67 38 7	59.8 33.9 6.3	4.30	1.23
Effective Farm Size	Hectare	-	0.15-5.37	Small (up to .5) Medium (.51 – 1.50) Large (above 1.51)	45 53 14	40.2 47.3 12.5	0.87	0.69
Annual Family income	'000' taka	-	35-380	Low (upto 100) Medium (101-200) High (201 and above)	60 42 10	53.6 37.5 8.9	119.86	61.21
Agricultural Input Availability	Score	0-15	0-15	Low (upto 5) Medium (6-10) High (11-15)	2 10 100	1.8 8.9 89.3	12.60	2.43
Family Knowledge on Agricultural	Score	00-40	9-38	Low (0-13) Medium (14-26) High (27-40)	3 93 16	2.7 83.0 14.3	22.63	4.84
Innovativeness	Score	0-40	0-36	No(00) Low (1-12) Medium (13-24) High (25-36)	6 33 65 8	5.4 29.5 58.0 7.1	14.62	7.36
Agricultural Training Exposure	No. of Days		0-6	No Training experience (0 days) Low Training experience (1-2 days) Moderate Training experience (3-4 days) High Training experience (5-6 days)	45 33 26 8	40.2 29.5 23.2 7.1	1.71	1.70
Commercialization	%		0-100	Low (00-33) Medium (33.01-66) High (66.01-100)	10 25 77	8.9 22.3 68.8	66.77	22.47
Level of Aspiration	Score	0-40	5-38	Low (0-13) Medium (14-26) High (27-40)	7 64 41	6.3 57.1 36.6	23.57	6.19

4.1.2 Family size

The number of family members ranged from 2 to 9. The mean was 4.30 with the standard deviation 1.23. Based on the family size score, the farm families were classified into three categories. Computed data indicated that 59.8 percent of the farmers had small family size, 33.9 percent of them had medium family size and 6.3 percent had large family size (Table 4.2).

Findings revealed that about half of the families had small family size. It is a general trend in Bangladesh that family size of the people is being decreased day by day.

4.1.3 Effective farm size

Farm size of the farm families ranged from 0.15 to 5.37 ha having an average of 0.87 ha and standard deviation 0.69. On the basis of the farm size of the farm families, they were classified into three categories. Data presented in Table 4.1 show that 40.2 percent of the farmers had small farm, 47.3 percent had medium and the rest 12.5 percent had large farm. Based on the observed information, it was very much clear that most of them had fewer to medium amounts of land holdings.

4.1.4 Annual family income

The observed range of the annual family income of the farm families varied from 35 to 380 thousand taka with a mean of 119.86 thousand taka and standard deviation of 61.21 thousand taka (Table 4.1). On the basis of annual family income, the farm families were categorized into three classes namely low, medium and high income respondents. The highest proportion of the respondents (53.6 percent) had low annual family income while 37.5 and 8.9 percent of them had medium and high annual family income respectively.

Findings revealed that most (90 percent) of the respondents' families had low to medium annual family income indicating the present status of the farmers. They operated mainly subsistence type of enterprises in the farms, so their annual family income remains low to medium.

4.1.5 Agricultural input availability

Agricultural input availability scores of the farm families ranged from 0 to 15. The average score and standard deviation were 12.59 and 2.42 respectively. Based on the agricultural input availability the respondents were classified into three categories. 89.3 percent of the respondents were high categories and only 1.8 percent and 8.9 percent of the respondents were low and medium range respectively.

The result show that most of the farmers got Agricultural input available.

4.1.6 Family knowledge on Agricultural

Family knowledge on Agricultural scores of the farm families ranged from 9-38 against the possible range of 0-40. The average score and standard deviation were 22.63 and 4.84 respectively. Based on the agricultural knowledge scores, the farm families were classified into three categories, namely low knowledge, medium knowledge and high knowledge (Table 4.2).

Data presented in the Table 4.2 revealed that 83 percent of the farm families had medium family knowledge on Agricultural, 2.7 percent had low knowledge and 14.3 percent had good knowledge. Thus, an overwhelming majority (83 percent) of the farm families had moderate knowledge.

4.1.7 Innovativeness

Innovativeness scores of the farm families ranged from 0 to 36. The mean score was 14.62 and standard deviation 7.36. On the basis of innovativeness scores, the farm families were classified into four categories as shown in Table 4.2.

Data presented in Table 4.2 indicated that the highest proportion (58 percent) of the farm families had medium innovativeness compared to 29.5 percent had low innovativeness, 7.1 percent had high innovativeness and 5.4 percent had no innovativeness. Data also revealed that majority (58 percent) of the respondents in study area had low to medium Innovativeness.

4.1.8 Agricultural Training Exposure

The observed range of the Agricultural Training Exposure of the farm families varied from 0 to 6 days with a mean of 1.71 and standard deviation of 1.70 (Table 4.2). On the basis of Agricultural Training Exposure, the respondents were categorized into four classes namely no, low, medium and high training exposure farm families. The highest proportion of the respondents (40.2 percent) had no training while 29.5, 23.2 and 7.1 percent of them had low, medium and high Agricultural Training Exposure respectively. Findings revealed that most (70 percent) of the respondents had no to low Agricultural Training Exposure.

4.1.9 Commercialization

It was found that the commercialization scores of the r farm families ranged from 00 to 100, the average being 66.77 and standard deviation 22.47. On the basis of commercialization scores mean, the farm families were classified into three groups as shown in Table 4.2.

It was showed that the highest proportion (68.8 percent) of the respondents constituted the high commercialization category as compared to 8.9 percent and 22.3 percent constituting the low and medium commercialization category



respectively. The findings indicated that respondents (68.8 percent) had medium commercialization of their produce and there was not a single respondent without some commercialization in any way.

4.1.10 Aspiration

The aspiration scores ranged from 5 to 38. The average and standard deviation was 23.57 and 6.19 respectively. Based on the computed scores of aspiration the farm families were classified into three categories as shown in Table 4.2.

It was showed that higher proportion (57.1 percent) had medium aspiration, 36.6 percent high and 6.3 percent low aspiration. Aspiration makes a man innovative and hard working to achieve success.

4.2 Household food consumption status

The range of household food security status was 66.39 to 130.75. The mean and standard deviation were 96.74 and 12.52 respectively. The food security of the farm families was divided into three categories presented below:

Table 4.3. Categorize the farm families by food consumption status

Categories	Basis of categorization	Number	Percentage
Low food consumption	<Mean - 1sd, i.e, <84.22	19	17
Medium food consumption	Mean \pm 1sd, i.e, 84.23- 109.26	80	71.4
High food consumption	>Mean + 1sd, i.e, >109.27	13	11.6

4.3 Relationships between the selected characteristics and their household food consumption status

Pearson's Product Moment Coefficient of Correlation (r) was computed in order to explore the relationships between the selected characteristics of the farm families and their household food consumption status. The coefficient of correlation (r) was used to test the null hypothesis regarding the relationship between two concerned variables. The null hypothesis was formulated as H_0 : There is no relationship between each of the selected characteristics of the farm families and their household food consumption status. The relationship between the concerned variables has been presented in Table 4.4. However, the correlation matrix among all the variables has been presented in Appendix-D.

Table 4.4. Relations between predicted and experimental variables

Characteristics of the farmers	'r' value with 110 df
Average family education	0.010
Family size	-0.092
Effective farm size	0.255**
Annual family income	0.239*
Agricultural input availability	0.106
Family knowledge on Agricultural	0.358**
Innovativeness	0.149
Agricultural training exposure	0.169
Commercialization	0.208*
Aspiration	0.044

** Significant at 1% level of probability

* Significant at the 5% level of probability

4.3.1 Average Family Education and Household Food Consumption Status

The correlation coefficient between family education of the farm families and the household food consumption status was 0.010 (Table 4.4). Computed 'r' value notified the non-significant relationship between family education and household food consumption status. So, the concerned null hypothesis could be accepted. It could be concluded that family education of the respondents could not influence their achievement of household food consumption status.

The majority of the farm families had low to medium family education. In addition, among the farm families 21.4 percent were highly educated. All of them wanted to achieve the food consumption status. Therefore, the relationship between these two variables was not significant.

4.3.2 Family size and Household Food Consumption Status

The correlation coefficient between family size of the farm families and the household food consumption status was -0.092 (Table 4.4). Computed 'r' value notified the negative and non-significant relationship between family size and the household food consumption status. So, the concerned null hypothesis could be accepted. It could be concluded that family size of the respondents could not influence their achievement of household food consumption status.

The majority of the farm families were small family size. The members of the small family always try to achieve the food consumption status. Therefore, the relationship between these two variables was not significant.

4.3.3 Effective farm size and Household Food Consumption Status

The correlation coefficient between farm size of the farm families and the household food consumption status was 0.255 (Table 4.4). Computed 'r' value

notified the significant relationship between farm size and the household food consumption status. So, the concerned null hypothesis could not be accepted. It could be concluded that farm size of the families could influence their achievement of household food consumption status.

The family who had large farm could achieve food consumption status easily. So the relationship between these two variables was highly significant.

4.3.4 Annual family income and Household Food Consumption Status

The correlation coefficient between Annual family income of the farm families and the household food consumption status was 0.239 (Table 4.4). Computed 'r' value notified the significant relationship between Annual family income and the household food consumption status. So, the concerned null hypothesis could not be accepted. It could be concluded that Annual family income of the families could influence their achievement of household food consumption status.

Higher annual family income of the farm families makes them more courageous to achieve food consumption status. Moreover, they can meet up the family needs at the expense of their income. Hence, the relationship between annual family income and the household food consumption status became significantly positive.

4.3.5 Agricultural input availability and Household Food Consumption Status

The correlation coefficient between Agricultural input availability of the farm families and the household food consumption status was 0.106 (Table 4.4). Computed 'r' value notified the non-significant relationship between

Agricultural input availability and the household food consumption status. So, the concerned null hypothesis could be accepted. It could be concluded that Agricultural input availability could not influence their achievement of household food consumption status.

Most of the farm families got all kinds of Agricultural facilities at their hand at any moment. There was no impact on achieving the food consumption status. Therefore, the relationship between these two variables was not significant.

4.3.6 Family knowledge on Agricultural and Household Food Consumption Status

The correlation coefficient between family knowledge on Agricultural of the farm families and the household food consumption status was 0.358 (Table 4.4). Computed 'r' value notified the significant relationship between family knowledge on Agricultural and the household food consumption status. So, the concerned null hypothesis could not be accepted. It could be concluded that family knowledge on Agricultural could influence their achievement of household food consumption status. They knew very well about their dietary need.

The respondent who had high family knowledge on Agricultural could achieve food consumption status easily. So the relationship between these two variables was highly significant.

4.3.7 Innovativeness and Household Food Consumption Status

The correlation coefficient between Innovativeness of the farm families and the household food consumption status was 0.149 (Table 4.4). Computed 'r' value notified the non-significant relationship between Innovativeness and the household food consumption status. So, the concerned null hypothesis could be accepted. It could be concluded that Innovativeness could not influence their achievement of household food consumption status.

4.3.8 Agricultural training exposure and Household Food Consumption Status

The correlation coefficient between Agricultural training exposure of the farm families and the household food consumption status was 0.169 (Table 4.4). Computed 'r' value notified the non-significant relationship between Agricultural training exposure and the household food consumption status. So, the concerned null hypothesis could be accepted. It could be concluded that Agricultural training exposure could not influence their achievement of household food consumption status.

This implied that most of the farm families got short duration or no training and there were not a big variation among the farm families.

4.3.9 Commercialization and Household Food Consumption Status

The correlation coefficient between Commercialization of the farm families and the household food consumption status was 0.208 (Table 4.4). Computed 'r' value notified the significant relationship between Commercialization and the household food consumption status. So, the concerned null hypothesis could not be accepted. It could be concluded that Commercialization could influence their achievement of household food consumption status.

Higher commercialization of the farm families makes them more courageous to achieve food consumption status. Hence, the relationship between commercialization and the household food consumption status became significantly positive.

4.3.10 Aspiration and Household Food Consumption Status

The correlation coefficient between aspiration of the farm families and the household food consumption status was 0.044 (Table 4.4). Computed 'r' value notified the non-significant relationship between aspiration and the household food consumption status. So, the concerned null hypothesis could be accepted.

It could be concluded that aspiration could not influence their achievement of household food consumption status.

This implied that farmers' aspiration was not an important factor for household food consumption status.



Chapter 5

Summary, Conclusion and Recommendations

CHAPTER 5

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Findings

5.1.1 Selected Characteristics of the Farm families

Family Education

According the classification, the percent of low family education was 25.9%, the medium family education was 52.7% and high family education was 21.4%.

Family size

Computed data indicated that 59.8 percent of them had small family size, 33.9 percent of them had medium family size and 6.3 percent had large family size.

Effective Farm size

It showed that 40.2 percent of the farm families had small farm, 47.3 percent had medium and the rest 12.5 percent had large farm.

Annual family income

The highest proportion of the farm families (53.6 percent) had low annual family income while 37.5 and 8.9 percent of them had medium and high annual family income respectively.

Agricultural Input Availability

89.3 percent of the farm families were high categories and only 1.8 percent and 8.9 percent were low and medium range respectively.

Agricultural Knowledge

Data revealed that 83 percent of the farm families had medium agricultural knowledge, 2.7 percent had low knowledge and 14.3 percent had good knowledge.

Innovativeness

Data indicated that the highest proportion (58 percent) of the farm families had medium innovativeness compared to 29.5 percent had low innovativeness, 7.1 percent had high innovativeness and 5.4 percent had no innovativeness.

Agricultural Training Exposure

The highest proportion (40.2 percent) had no training while 29.5, 23.2 and 7.1 percent of them had low, medium and high Agricultural Training Exposure respectively.

Commercialization

It was showed that the highest proportion (68.8 percent) constituted the high commercialization category as compared to 8.9 percent and 22.3 percent constituting the low and medium commercialization category respectively.

Aspiration

It showed that higher proportion (57.1 percent) had medium aspiration, 36.6 percent high and 6.3 percent low aspiration.

5.1.2 Household Food Consumption status

According to the Mean \pm 1sd, low food consumption status, medium food consumption status and high food consumption status families were 17 percent, 71.4 percent and 11.6 percent respectively.

5.1.3 Relationships between the experimental Variables and Household Food Consumption status

Pearson's Product Moment Coefficient of Correlation (r) was computed in order to explore the relationships between the selected characteristics of the farm families and the household food consumption status. The coefficient of correlation (r) was used to test the null hypothesis regarding the relationship between two concerned variables. Effective farm size, annual family income, commercialization and family knowledge on agriculture showed significant positive relationship. Family education, innovativeness, family training exposure, input availability and aspiration showed positive relationship and only Family size showed negative relationship.

5.2 Conclusions

Findings of the study and the logical interpretations of their meanings in the light of other relevant facts prompted the researcher to draw the following conclusions:

- ❖ The findings of the study showed that low food consumption status, medium food consumption status and high food consumption status families were 17 percent, 71.4 percent and 11.6 percent respectively. It might be showed that few amounts of people had low food consumption status.
- ❖ Effective farm size, family knowledge on agriculture had a highly significant positive relationship with the household food consumption Status. It may be said that effective farm size, knowledge on agriculture of the farmers enables to improve the food consumption status. Knowledge helps to change an attitude of the farmers which in turn enables to adopt new Agricultural technologies and applied it in his farm and consequently it might have helped achieve household food consumption status.

- ❖ Commercialization, Annual family income had a significant positive relationship with the household food consumption status. Highly commercialization leads to earn higher annual income. Eventually, commercialization and family income were important indicators of the contribution of achieving household food consumption status.

5.3 Recommendations

5.3.1 Recommendations for policy implication

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

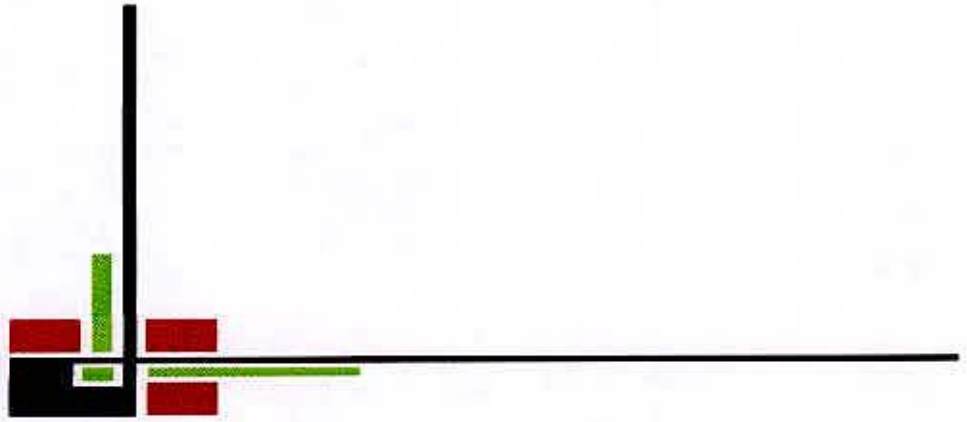
- The unsatisfied dietary needs of the family members should be fulfilled in order to have healthy manpower. Government should take initiatives to achieve the household food consumption status in this regard.
- Family size should be kept under control as small as possible through long term family planning for the farmers. It would minimize the annual dietary needs of the family and the status of household food consumption would ultimately be increased.
- Land tenure policy should be reformed by the government action and properly monitored in order to promote the decision making capacity and benefits from the sharecropping, leased and mortgaged farms by the farmers.
- Extension organizations including Department of Agricultural Extension (DAE) have to conduct more number of result demonstration and other educational programs for the farmers especially having comparatively larger farm size to increase the knowledge and income of their farms. DAE should also conduct result demonstration as a method of motivation.

- Government and non-government organizations should improve training facilities according to need of farmers for increasing their knowledge, management skill and operational ability for practicing different farming activities in achieving their household food consumption.

5.3.2 Recommendations for further study

The researcher conducted a small piece of study which could not make available all information for the proper understanding of the household food security status. Therefore, the following recommendations could be made for further research works:

- ✓ The present study was conducted in one union namely Kandua of Jamalpur sadar upazila of Jamalpur district. Similar studies may be conducted in other parts of the country to generalize the findings.
- ✓ The study was undertaken to explore the relationships of ten selected characteristics of the farm families and the household food consumption status. Therefore, it could be recommended that further studies should be conducted with other experimental and predicted variables.
- ✓ The present study was exclusively confined to household food consumption status. Further studies should be conducted to determine various aspects of food consumption of the farm families.



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Appendices

Appendix A
 (English Version of the Interview Schedule)
Department of Agricultural Extension and Information System
Sher-e-Bangla Agricultural University, Dhaka.

An interview schedule on

**Household Food Consumption Status of the Rural Families
 of Jamalpur Sadar Upazila**

Serial No. : -----

Name of respondent : -----

Father's/Husband's Name : -----

Village : ----- Upazila : -----

Mobile:

1. Please mention the following information about your family members.

Sl No.	Name of the family members	Relationship with you	Gender	Age	Educational status	Calorie need in a week
		Self				

2. Effective farm size

Please furnish information about your effective farm size.

Sl. No.	Type of land use	Land area	
		Local unit	Hectare
1	Homestead area (A_1)		
2	Own land under own cultivation (A_2)		
3	Land taken from others on barga (A_3)		
4	Land given to others on barga (A_4)		
5	Land taken from and/or given to others as lease (A_5)		
Total			

$$\text{Total farm size} = A_1 + A_2 + \frac{1}{2}(A_3 + A_4) + A_5$$

3. Annual Income

Please mention your annual income from the following different sources (last year).

Source of income		Amount (Tk)
Agriculture sector	1. Field crops production	
	a) Rice	
	b) Wheat	
	c) Sugarcane	
	d) Jute	
	e) Mustard	
	f) Potato	
Livestock, poultry and fisheries sector	2. Vegetables production	
	3. Fruits production	
	4. Cow sheep, goat etc. rearing	
Livestock, poultry and fisheries sector	5. Poultry and pigeon etc. rearing	
	6. Fish culture	
	Non-agricultural sector	7. Business
8. Service		
9. Daily labour		
10. Others		
Total		

4. Agricultural knowledge

Please answer the following questions.

Sl. No.	Questions	Total marks	Marks obtained
1	Name two modern varieties of paddy.	2	
2	Mention two harmful insects of paddy.	2	
3	Name two modern varieties of potato.	2	
4	Name two modern varieties of wheat.	2	
5	Mention the name of two weeds of paddy.	2	
6	Name two varieties of Banana.	2	
7	Mention the name of two green manure crops.	2	
8	Name two varieties of goat.	2	
9	Name two predator species of fish.	2	
10	Mention the two methods for controlling rats.	2	
11	Mention the names of two her disease.	2	
12	Mention the names of two fertilizers to your local Bazar.	2	
13	Mention problems associated with improve poultry rearing.	2	
14	Name two winter vegetables.	2	
15	Name two summer vegetables.	2	
16	Mention the names of two fruits available over year.	2	
17	Name two organic fertilizers.	2	
18	Name two fruits of vitamin-C.	2	
19	Mention the names of two insecticides.	2	
20	Mention two characteristics of good seed.	2	
	Total	40	

5. Innovativeness

Please indicate the extent of your use of the following agricultural technologies.

Name of technology	Never used	Time of adoption after Hearing			
		Within 1 year	1-2 years	2-3 years	After 3 years
1. Hybrid rice cultivation					
2. Use of green manure crops					
3. Use of granule urea					
4. Use of power tiller					
5. Use of weedicide					
6. Use of sulpher fertilizer					
7. IPM					
8. Poultry rearing					
9. Compost					
10. Artificial breeding of cattle					

6. Agricultural Input availability:

Please give your information about following inputs availability.

Inputs	Degree of availability			
	Highly	Moderately	poorly	Not at all
1. Availability of Quality seeds				
2. Availability of fertilizer				
3. Availability of pesticide				
4. Availability of farm implement				
5. Irrigation facilities				

7. Agricultural training exposure

Have you received any training on agriculture? Yes No

If yes, please mention

Sl. No.	Name of training course	Duration (days)
1		
2		
3		
4		
5		

8. Level of aspiration

Please state your level of aspiration on the following items by putting tick mark on appropriate column.

Aspiration	Extent of aspiration				
	0	1	2	3	4
1. What level you expect your sons to reach in their education?	No education ()	Primary Level ()	Secondary level ()	Higher Sec Level ()	Graduate and above ()
2. What level you expect your sons to reach in their education?	No education ()	Primary Level ()	Secondary level ()	Higher Sec Level ()	Graduate and above ()
3. What level you expect your daughters to reach in their occupation?	Own occupation ()	Improved Occupation ()	Small business or service ()	Big business or service or Respectful occupation ()	Most respectful occupation or service ()
4. What is your Aspiration in respect to increase your own land in the next 3 year?	None ()	<25 % ()	>25-50% ()	>50-75% ()	>75% ()
5. What is your Aspiration in	None	<25 %	>25-50%	>50-75%	>75%

respect to crop production in the next 3 years?	()	()	()	()	()
6. What is your expectation with regard to Purchase of Agricultural implements/ Machineries in the next 3 years?	None ()	Small agril Implements ()	Thresher ()	Shallow tube well ()	Power triller ()
7. What is your Aspiration in respect to increase your income in the next 3 years?	None ()	<25 % ()	>25-50% ()	>50-75% ()	>75% ()
8. What is your aspiration with regard to house alteration or construction in the next 3 years?	None ()	Slight Improved of present house ()	One tin roof house ()	One building/mor e than one tin roof house ()	More than one building ()
9. What is your expectation with regard to Purchase of recreational instrument in the next 3 years?	None ()	Radio ()	Two in one cassette player ()	Television ()	Television with VCP ()
10. What level or post you expect to reach in your group or higher coordination committee in the next 3 years?	None ()	Executive of primary group ()	Executive of village coordinati on committee ()	Executive of union coordination committee ()	Executive of above union coordination committee ()

9. Commercialization:

Please furnish the particulars of selling of your produces last year

Sl No.	Source of production	Total Yield	Unit price	Value of total yield	Quantity of sold crop	Value of sold crop
1	Rice					
2	Wheat					
3	Jute					
4	Potato					
5	Pulse					
6	oilseed					
7	chilli					
8	Vegetable					
9	Fruits					

10. Food Consumption Status

Please mention the type and amount of food consumed by your family in last 7 days.

Sl.no.	Food Item	Total Quantity Consumed(kg)	Equivalent to kcal
1.	Rice		
2.	Wheat		
3.	Fish		
4.	Meat		
5.	Milk		
6.	Egg		
7.	Pulse		
8.	Vegetables		
	a		
	b		
	c		
	d		
	e		
	f		
9.	Fruit		
10.	Oil		
11.	Others (If any)		
Total			

Food security(%) = Consume kcal / Required kcal *100

Thank you for your kind co-operation in data collection



Signature of interviewer

Date:

Appendix: B

Conversion factor used to calculate adult equivalence scales		
Age Groups(years)	Male	Female
0-2	0.40	0.40
3-4	0.48	0.48
5-6	0.56	0.56
7-8	0.64	0.64
9-10	0.76	0.76
11-12	0.80	0.88
13-14	1.00	1.00
15-18	1.20	1.00
19-59	1.00	0.88
60 and above	0.88	0.72

Source: World Bank (1986)

Appendix: C

Calorie content of the foods consumed in the study area

Name of the food items	Calorie contents per 100 grams of each food item(Kcal)
Cereals	
Rice	346.5
Wheat (atta)	341
Parched rice (chira)	346
Fried rice (muri)	325
Pulses	
Lentil	343
Dry pea	315
Fish	
Telapia	128
Puti	106
Prawn	89
Dry fish	275
Hilsa	273
Meat, egg and milk	
Beef	114
Chicken	109
Hen egg	173
Duck egg	181
Cow milk	67
Vegetables	
Potato	89
Brinjal	42
Ladies finger	43
Pushak	27
Palong shak	20
Mukhi kachu	266
Kachu shak	56
Lal shak	43
Pumkin	25
Palong	20
Fruits	
Banana	109
Mango	90
Guava	57
Edible oil	
Soyabean oil	883
Others	
Sugar	389
Gur	394

Source: World Bank (1986)

Appendix: D
Correlations

Characteristics of the farm families	Average Family Education	Family Size	Effective Farm Size	Annual Family Income	Agricultural Input Availability	Family Knowledge on Agricultural	Innovativeness	Family Training Exposure	Commercialization	Aspiration	Household Food Consumption Status
Average Family Education	--										
Family Size	.131	--									
Effective Farm Size	.160	.266(**)	--								
Annual Family Income	.215(*)	.526(**)	.504(**)	--							
Agricultural Input Availability	.164	.156	.235(*)	.216(*)	--						
Family Knowledge on Agricultural	.210(*)	.023	.440(**)	.302(**)	.441(**)	--					
Innovativeness	.282(**)	.080	.540(**)	.362(**)	.486(**)	.583(**)	--				
Family Training Exposure	.177	.046	.451(**)	.372(**)	.361(**)	.547(**)	.663(**)	--			
Commercialization	.012	-.146	.356(**)	.138	.562(**)	.554(**)	.604(**)	.430(**)	--		
Aspiration	.359(**)	.305(**)	.245(**)	.284(**)	.237(*)	.423(**)	.292(**)	.266(**)	.209(*)	--	
Household Food Consumption Status	.010	-.092	.255(**)	.239(*)	.106	.358(**)	.149	.169	.208(*)	.044	--

* Correlation is significant at the 0.05 level (2-tailed).
 ** Correlation is significant at the 0.01 level (2-tailed).

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