

Food Security in Bangladesh: Role of Public Policies

A Dissertation

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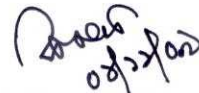
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Statement of the Candidate

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Abbreviations

ADP-Annual Development Program
BADC- Bangladesh Agricultural Development Corporation
BBS- Bangladesh Bureau of Statistics
BCCSAP- Bangladesh Climate Change Strategy and Action Plan
BRRI- Bangladesh Rice Research Institute
CBN-Cost of Basic Needs
FAO- Food and Agricultural Organization
FFE-Food for Education
FFW- Food for Work
GDP- Gross Domestic Product
GECAFS- Global Environmental Change and Food Systems
GHI- Global Hunger Index
GoB- Government of Bangladesh
GR- Gratuitous Relief
Ha- Hectare
HCR- Head Count Rate
HES- Household Expenditure Survey
HH- Household
HIES- Household Income and Expenditure Survey
HYV- High Yielding Varieties
IFRI- International Food Policy Research Institute
IPCC- International Panel on Climate Change
IPM- Integrated Pest Management
IRRI- International Rice Research Institute
K. Cal. - Kilo Calorie
LDCs- Least Developed Countries
MDG- Millennium Development Goal
MT- Metric Ton
NAPAs- National Adaptation Programs of Actions
NGO- Non Government Organization
NSAPR-National Strategy for Accelerated Poverty Reduction

OMS- Open Market Sale

PFDS- Public Food Distribution System

PPP- Public Private Partnership

RMG- Ready Made Garments

SPSS- Statistical Program for Social Science

SSNP- Social Safety Net Program

SWF- Seed, Feed and Wastage

Tk. - Taka

TR- Test Relief

UN- United Nations

UNDP- United Nations Development Program

UNICEF- United Nations International Children Emergency Fund

VGD- Vulnerable Group Development

VGf- Vulnerable Group Feeding

WCED- World Commission on Environment and Development

WFC- World Food Conference

WFP- World Food Program

WTO- World Trade Organization

Abstract

Ensuring food security for a huge population in Bangladesh with scarce land and limited resources is largely dependent on increasing domestic food production, proper management of food grain coupled with effective population control. Although the country has made good progress in increasing rice production through technological improvement and the supply of subsidized agricultural inputs; but the growing number of population always create pressure on the increasing production. Again domestic food production is very frequently damaged by the recurrent floods, droughts etc. that lead to sudden shortfall in food grain production. Inadequate production of food grain hampers the proper stock management of the government to run the social safety net programs as well as to intervene in the market at the time of price hike. At the same time weak diversification of crops leads the poor people to an unbalanced diet.

As still 40 percent of the population lives below the poverty line, income inequality is prevalent; lack of proper management of food is distinct, growth of population is continuing at the rate of 1.50 percent, so any sort of mismanagement and price hiking hits the poorest, landless household severely. In this situation the present study assesses the current trends of food security in Bangladesh both at micro and macro level. Micro level study was done with the analysis of primary data from two small villages of Sadar upazila under the district of Mymensingh. The study identifies the factors addressing food insecurity in Bangladesh along with the role of government policies in ensuring food security of the citizen. The study also focuses on the poverty and distribution of income and access to food through market. Finally the paper makes specific recommendations in line with the policy measures for ensuring food security particularly for the poor people of the country.

Chapter – One

Introduction

Prelude

Despite some commendable progress in several development indicators, pervasive poverty and under nutrition still persists in Bangladesh. Although the production of food grain has become double as compare to early 1970s, still Bangladesh remains a food deficit country due to weak implementation of policies regarding food, agriculture and related sectors. At present 40.4 percent people's food intake is less than 2122 kilocalorie per capita per day, whereas 19.5 percent people's per capita per day food intake is less than 1805 kilocalorie (BBS: 2007: IX). Again the typical rural diet in Bangladesh is repeatedly not well balanced. The main food in Bangladesh is cereals, largely rice. Nearly two thirds of the daily diet consists of rice, vegetables, a little amount of pulses and small quantities of fish. Milk, milk products and meat are consumed occasionally in very small amount. Fruit consumption is seasonal and includes mainly papaya and banana (FAO: 2007:1). To address the issue of balanced diet and to ensure minimum food for all, government of Bangladesh has taken initiatives formulating and implementing different policies. In view of the facts, the current study attempts to identify the areas where and how food security of the citizens is being hampered, how it can be achieved and what role public policies can play in ensuring food security in Bangladesh. The suggestions of this study will hopefully help attaining food sufficiency and to ensure food security in Bangladesh. With ensuring food security human capital development will be easier which will eventually lead to the development of the country.

Background of the Study

Since its inception Bangladesh has made commendable progress in several development indicators like reducing population growth and child mortality rate, achieving gender and urban-rural parity in primary education, coping with natural disasters, doubling the food grain production compared to the decade of 1970s and positive pro-poor changes in different policies related to food and agriculture, but ensuring safe and nutritious food for its huge population is still great concern for the government of Bangladesh and needs policy attention properly . Due to pervasive poverty, 40.4 percent of the total population cannot afford an adequate diet necessary for an active and healthy life (BBS: 2007:7).

Food and Agricultural Organization (FAO) depicts that average calorie intake per capita per day in Bangladesh is 2230 kilocalorie but the contribution of food groups to total dietary energy supply is not in the recommended range of balanced diet. Statistics suggests that in Bangladesh 81 percent of total dietary energy supply comes from carbohydrate and only 9 percent of total dietary energy supply comes from protein (FAO: 2008:51). But for a balanced diet the proportion of carbohydrate should be around 55% (Harun *et al.*: 2005: 27). Research conducted by United Nations International Children Emergency Fund (UNICEF), WFP and Institute of Public Health and Nutrition shows that in Bangladesh presently 25 percent families are food insecure. All over the country families are spending 62 percent of their income for purchasing food. Among them low labor class families are spending 76 percent of their income for purchasing food (Nayadiganta: 2009:8). With other factors, recent price hike of food grain in the global market has made the situation more critical. Leaving one fourth of total population hungry, the social and economic development of the country is nearly impossible. So, the challenges for ensuring food security are a great concern for the policy makers in Bangladesh.

To ensure the food security of the poor, the issue of addressing hunger has been repeatedly articulated in various national, regional and international forums. In Bangladesh the right to food has been incorporated in the Constitution of the People's Republic of Bangladesh as a fundamental principle. Article 15(a) of the Constitution of Bangladesh says that –‘It shall be a fundamental responsibility of the state to attain ... basic necessities of life, including food, clothing, shelter, education and medical care...’ It was also clearly enunciated in the World Food Conference (WFC), which clearly declared that ‘every man, woman and child has the inalienable right to be free from hunger and malnutrition’ (WFC: 1974: 37). To comply with the constitutional obligations, the Government of Bangladesh has formulated different policies like National Agriculture Policy, National Food Policy, and Disaster Management Policy etc. and to implement the policies different programs like Poverty Alleviation Programs, Weather Forecasting System, Public Food Distribution System (PFDS) etc. have been taken. National Agriculture Policy has been formulated giving emphasis to the increase of agricultural production with the progress in preservation, processing, marketing and

extension of agricultural crops including animal husbandry, fisheries and forestry for ensuring food based nutrition to improve food security down to the household level. National Disaster Management Policy has been formulated to minimize the risk of natural calamities both in life and property with a view to ensure food security immediate after natural calamities hits the people.

Along with other policies National Food Policy, 2006 has been formulated with the objectives of ensuring availability of sufficient, safe and nutritious food; ensuring accessibility of food with the increase of purchasing power of the people; and ensuring nutrition for all especially for women and children. Accordingly with huge population under poverty line Government has adopted United Nations Millennium Development Goal in 2000. One of the targets of the goals is to halve the proportion of people who suffers from hunger between 1990 and 2015 (World Bank Group: 2003: 2). National Strategy for Accelerated Poverty Reduction (NSAPR) has been taken to reduce the poverty which will help to ensure food security of the poor. Formulation and implementation of proper policies mainly depends on the bureaucracy of the country. But in Bangladesh after long 38 years of her independence the present reality is that the civil service remains totally inadequate, ineffective, corrupt and out of tune (Khan:2002:3). With the present reality sudden increase in global food prices have triggered a wide variety of policy responses around the world. To meet the constitutional responsibility as well as to achieve millennium development goals related to poverty reduction rather to say ensuring food security has become a great concern for the policy makers of Bangladesh.

Objectives

With the above discussion the objectives of my study focuses on the following aspects:

- To explore the current status of food security in Bangladesh on the basis of availability, accessibility and utilization of food;
- To identify the role of different public policies in ensuring food security of the people; and

- To examine whether a rigorous population control policy especially among the downtrodden population should be incorporated in the policy measures for ensuring food security.

Methodology

Research has been conducted on the basis of both quantitative as well as qualitative data. Both primary and secondary data were used for the purpose of the study. As secondary sources of data different books, journals, survey reports, articles from daily newspapers, periodicals and websites have been consulted. As a policy research different government policies related to food and nutrition have been consulted. Primary data has been collected through a semi-structured questionnaire. For collection of primary data 50 families were randomly selected from two villages namely Kustia Namapara and Putiali of Sadar upazila under the district of Mymensingh. Data have been processed and analyzed by using MS Excel. Primary data has been analyzed from different aspects of food security. To get the overall status of food security in Bangladesh secondary data has been analyzed on the basis of time series data. Due to time and resource constraint primary data have been collected only from two small villages of Mymensingh district namely Kustia Namapara and Putiali. For macro level analysis secondary data has been taken from different HIES report but in case of micro level analysis primary data of 50 respondent families are collected. Due to time and budget constraint it was not possible to collect data for a long period from different parts of the country.

Literature Review

A number of related literatures like books on the issues related to food, nutrition and food security, publications by different authors, reports presented in different conferences, seminars and articles published in dailies and periodicals have been consulted to conduct the study. A report entitled *Food 2000: Global Policies for Sustainable Agriculture* published by World Commission on Environment and Development (WCED) depicts on world regional food production that gave emphasis on the factors of agricultural production with some suggestions as action points for ensuring sustainable food and

livelihood security. The book suggests the ways of government intervention for sustainable livelihood security.

Another work titled *Food Security in South Asia* written by Dr. B. M. Bhatia reveals that the study of food security problems in this region should be of interest not only to the peoples and governments of this region, but also to the rest of the world (Bhatia: 1985:43). He discussed the food security problem of the countries of South Asia individually as well as of the region as a whole in the perspective of international effort at building a world food security system. He emphasizes on the action of regional as well as global cooperation for ensuring food security with the overall improvement in development for optimum agricultural growth. Finally he has suggested a plan of action on world food security by adopting food grain stock policies, special arrangement for food security assistance and collective self-reliance of developing countries with increased agricultural growth, ensuring distribution of agricultural inputs, exchange of technical education and training facilities, managing pest as well as increasing regional cooperation for joint development of water, power and other resources essential for agricultural development.

Alam G. Smith (1997) in his book titled *Human Rights and Choice in Poverty: Food Insecurity, Dependency, and Human Rights Based Development Aid for the Third World Rural Poor* discussed about the poverty, client based dependency, and the target group indicator in Bangladesh, Botswana and Tanzania. In Bangladesh chapter titled as 'The Scope of Food Supply and Health Care Insecurity in Bangladesh: Calorie intake and malnutrition' the author mentioned about the geo-climatic circumstances of Bangladesh favorable to agriculture. He mentioned about the problem of rural poverty and food insecurity of Bangladesh with available data of daily calorie intake based on different HES. To ensure food security for the rural poor he suggested draft animals, plows, simple technology water control devices such as hand pump tube wells and land to bring unencumbered ownership up to an acre. In another writings of Shiva and Bedi (2002) titled *Sustainable Agriculture and Food Security* mentions about the role of World Trade Organization (WTO) regarding food security and the right to livelihood for most developing countries. They argued that vast majority of the peoples of these countries derive their food entitlements primarily by producing food themselves, particularly as

expressed by WTO, is conversely threatening the very foundations of the Third World agrarian economies and hence could condemn millions of small and marginal farmers to perpetual poverty while seriously damaging the environment and bio-diversity. They have related globalization and food security, globalization of food insecurity and the impact of trade liberalization in case of food security particularly in the developing countries.

Leather and Foster (2005) in their book titled *The World Food Problem-Tackling the Causes of Undernutrition in The Third World* illustrates the causes and effects of under nutrition and related policies. The book elaborately examines the facts and provides answers to questions such as: What is malnutrition? How do we measure it? Who is malnourished? What are the trends? It illustrates the main causes of malnutrition and attributes these causes mainly economic, demographic, and agronomic and health variables. Finally they have explored public policies that would have an impact on under nutrition. The last portion of their writings contains some speculation regarding food and nutrition of the future generation. Felix W. Charles (1987) in his book titled *Food Protection Technology* mainly focuses on the utilization of food based current and protected technologies for food protection. He contributes mainly on risk assessment, toxicology, microbiology, epidemiology and surveillance of food borne diseases, developing regulations and standards for food production and service, quality in manufacturing processes, consumer's education on food and nutrition, and genetically engineered foods, and other chemical food and safety problems.

Ahmad in his work titled *Towards Ensuring Food Security in Bangladesh* has dealt with wide range of issues relating to food insecurity in Bangladesh including the nature and magnitude of the problem, the way its resolution may be approached, the constraints faced and how those may be addressed, and the need for social mobilization and community empowerment for solving the problem (Ahmad: 2001: 161-181). Identifying some areas of policy planning and actions he has made some specific recommendations on agricultural growth, population control, control of food prices and control of agricultural inputs to solve the problem of food security. Hossain *et al.* (2005) worked on 'Food Security and Nutrition in Bangladesh: Progress and Determinants' and mentioned food security is synonymous to achieving self sufficiency in food production.

In their study they mentioned that Bangladesh has made good progress in increasing rice production through technological progress facilitated by private sector investment in small scale irrigation. The paper assesses the trends in factors that affect food production, availability of food and their impact on nutrition outcomes. He has suggested for policy measures to enhance food security with the review of Agricultural Policies with the increased access to food through market. Talukder (2005) in his article titled 'Food Security, Self-sufficiency and Nutrition Gap in Bangladesh examined the status of food security and self-sufficiency of Bangladesh using both time series and cross section data. He founded that in reality Bangladesh is the net importer of food grain. He has suggested for the elimination of nutrition gap with different sorts of food intervention programs with the existing programs.

Zaman *et al.* guided by World Bank in their work 'Rising Food Prices- Are the right policy choices' mentioned rapid increase in prices of food has made the food security situation worse(World Bank:2008:6). They have suggested for lowering the domestic food prices by providing subsidies to agricultural inputs as well as investment in basic rural transport and information systems to reduce prices and increase opportunities. A report published by FAO in 2008 on 'The State of Food Insecurity in the World 2008' focuses on high prices, which are having a serious impact on the poorest populations in the world, drastically reducing their already low purchasing power. They mentioned that high prices of food have increased the level of food deprivation specially the poor people of the world.

In view of the above discussion and consultation of different literature and works done by different researchers it is found that food security is a multicultural issue. The issue of food security has been described by different researchers from different aspects. Some has made importance on increasing food grain production; some argued for fair distribution, some has made importance on sufficient stock of food grain with targeted intervention as a Social Safety Net Program (SSNP). From the above discussion it is very clear that as a multidisciplinary issue it draws attention to be addressed from various aspects including policy measures. It involves a number factors like increasing production of food grain, distribution of food grain, marketing of food grain as well as food assistance to the poor as an emergency based food intervention to meet the demands

of the poor. The present study is an endeavor to find out the current status of food security in Bangladesh both at macro and micro level, to explore the key constraints of food security. On the basis of the constraints to identify what role is played by the government and what should be policy role for ensuring food security of the poor specially for the downtrodden population like landless agricultural laborers, artisans, small and marginal farmers, fishermen, and rural non-farm and urban informal workers.

Organization of the thesis

For the convenience of the study, the paper is prepared under six chapters. Chapter one is Introduction starting with prelude, background of the study, aims and objectives, methodology including limitations, literature review and organization of the thesis. Chapter two contains the conceptual framework in which definition of food security and food insecurity, components of food security, dimensions of food security, measuring food security and insecurity, indicators of food security has been discussed. Chapter three discusses about the current status of food security in Bangladesh. In this section food security has been discussed in light of GHI, domestic food production, food import, food intake, calorie intake, household's entitlement to land etc. It discusses about the current status of food security on the base of primary data of two villages of Sadar upazila under the district of Mymensingh. In this part data has been analyzed from different aspects of food security giving importance on the average family members of the respondents, entitlement to land, and educational qualification with monthly income, expenditure and households per capita per day food intake by different groups. Chapter four identifies the factors addressing food insecurity in Bangladesh. Chapter five illustrates the role of public policies in ensuring food security and Chapter six makes some suggestions in ensuring food security of the country under the heading recommendations followed by conclusion.

Chapter - two

Conceptual Framework

Prelude

The concept of food security has evolved over a period of time. Until 1970s, adequate availability of food grains at the national level was considered as a good measure of food security. Emphasis was placed on food self-sufficiency at the national level, principally through domestic production. But in the early 1970s, rising fertilizer prices followed by the bad crop in the Soviet Union combined with the increasing demand of worldwide food grain reserve made the price of food grain skyrocketing. In 1974, World Food Conference added another dimension to food security when it emphasized, apart from the overall availability, stability of food supplies within and over the years. At that time it was found that 'the global grain bin was nearly empty' (Gilmore and Huddleston: 1983). Thus the phrase "food security" entered the literature, and food security was discussed as a problem of grain importing countries (Chisholm and Tyers: 1982).

The debate

To most people in Bangladesh, the common perception is that food essentially means food grains, mainly rice. This is the staple food in this country and the large majority of the population traditionally derives most of the nutrients by consuming rice. So, more commonly food security means a stock of cereals that can be used to meet an unforeseen food crisis. As food certainly is not cereal alone, so its security is not just a sufficient amount of cereal stock. Food means balanced diet and its security refers to availability of such diet at a reasonable price. In 1985 Anderson, J. R. and J. A. Roumasset have developed a series of inequalities for conceptualizing the risk of food insecurity on a national scale (Anderson and Romumasset: 1985). By adapting these inequalities to the household level, we can better understand the concept of food security as well as what delivers the risk of food insecurity to a household. According to them the equation is:

$$\text{Value of food production deficit in a household (HH)} \leq \text{Income and liquid assets available to purchase food}$$

In its simplest form, the food security equation compares the value of the food production deficit in a household with the income and liquid assets that household has available to purchase food. The value of that deficit is simply the minimum cost of

purchasing such a supply of food. From the equation it can be mentioned that a household becomes more food-secure when the right hand side of the equation is bigger relative to the left. It becomes less food secure when the left-hand side of the equation is bigger relative to the right. The risk of food insecurity is the probability that the left-hand side of the equation will be bigger than the right. The left-hand side of the equation can be factored into two components, the food purchase requirement and the price of food, for the value of the food production deficit is the product of these two variables. So the equation can be rewritten as follows:

$$\text{Food purchase requirement} \times \text{Price of food} \leq \text{Income and liquid assets available to purchase food}$$

From the above equation now we can demonstrate how the price of food affects food security. If the price goes up, the left-hand side gets bigger, and we see a greater risk of food insecurity. If the price goes down, the risk of food insecurity is reduced. In case of above equation the household's food purchased requirement can be shown as the difference between two factors: household (HH) food consumption requirement and HH production. The greater the households food production the less the food purchase requirement; the smaller the households food production the larger the food purchase requirement. Now we can rewrite the equation as follows:

$$\{\text{HH food consumption requirement} - \text{HH food production}\} \times \text{Price of food} \leq \text{Income and liquid assets available to purchase food}$$

For any given family, to the extent that we can adopt policies to assure that the left-hand side of the above equation is smaller than the right-hand side, we will reduce the risk of food insecurity. The household food consumption requirement is affected by the number of people in the household and by their age, sex, health and working status. Good health reduces the household food consumption requirement. At the same time childbearing and lactating mother need more food during pregnancy and lactation period and thus increases the consumption requirement.

Factors in Food Security

From the above equation it is clear that household food security is dependant on many factors. The poorest people in the world are generally landless and the household production and food security is mainly related to the families land ownership. In addition to the ownership of land, food production in farming household is influenced by a complex set of variables including the education of the farm manager and his workers, the quantity and quality of technology and capital available, how this technology and capital are used, and a set of government incentives and disincentives which includes tariffs, taxes, price controls and subsidies to agricultural and purchased inputs. With the production of food prices of food, income and liquid assets of the households also determines the food security of the family. The price of food is influenced by amount of food demanded, quantity produced, the size of the population as well as the per capita income and the tastes and preferences of consumers. The income and liquid assets positions of a household is the result of complex factors, among them education of its members, its capital position, its land position, its employment opportunities, attitude towards work, the cost of transportation to and from work, health and tendency to savings.

Reutlinger and his colleagues maintained that '*The world has ample food. The growth of global food production has been faster than the unprecedented population growth of the past forty years. ...Yet many poor countries and hundreds of millions of poor people do not share in this abundance. They suffer from a lack of food security, caused mainly by a lack of purchasing power*' (Reutlinger *et al.* 1986:1). From the above mentioned statement it is found that in the past forty yeas the production of food has increased than the unprecedented population but the lack of access to food due to poor purchasing power by the many of the poor countries of the world is one of the key factors of food insecurity. Hence, Reutlinger and his colleagues defined the term Food Security as 'access by all people at all times to enough food needed for an active and healthy life, its essential elements are the availability of food and the ability to acquire it' (Reutlinger: 1986:3). They argued that food production is no longer considered important in the hunger problem, it exists. They argued food shortages result in high food prices for food, which in turn make difficult for the poor to purchase adequate food.

World Bank (1986) defines 'Food Security is access by all people at all times to enough food for an active, healthy life'. World Commission on Environment and Development (1987) states Food Security as Sustainable Livelihood Security. Livelihood is defined as adequate stocks and flows of food and cash to meet basic needs. Security refers to secure ownership of, or access to, resources and income-earning activities, including reserves and assets to offset risk, ease shocks and meet contingencies. Sustainable refers to the maintenance or enhancement of resource productivity on a long-term basis. A house hold may be enabled to gain sustainable livelihood security in many ways- through ownership of land, livestock, or trees; rights to grazing, fishing, hunting or gathering; through stable employment with adequate remuneration; or through varied repertoires activities.

Amartya Sen(1981) has written extensively on the economics of hunger. Sen uses the term 'entitlements' to refer to an individual's ability to acquire food. "Since food ... [is] not distributed freely, people's consumption depends on their 'entitlements' that is, on the ... goods over which they can establish ownership through production and trade, using their own means. Some people own the food they themselves grow, while others buy [food] in the market on the basis of the incomes earned" (Sen, 1990). Sen points out that hunger can exists when there are not food shortages in the aggregate. In this framework, hunger can be seen as 'entitlement failure' – the failure of a person to assert an entitlement right to a quantity of food large enough to provide adequate nutrition. Production, income and price all work together in defining a person's entitlement; and entitlement depends on social, political and cultural systems in which the person lives. According to him in most of the developing countries food insecurity which leads to famine is not for the reason of insufficient food rather to lack of access to food by poor people.

The Plan of Action of the World Food Summit, 1996 defines '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'. Thus food security is defined as availability, access, and utilization by all people at all times to enough food for an active, healthy life. Food Insecurity has been

described as 'a condition in which people lack basic food intake to provide them with the energy and nutrients for fully productive lives' (Hunger Task Force).

Conceptualizing the discussion

In view of the above discussion the present study starts with the conceptualizing of the basic idea regarding food security, food insecurity, determinants of food security, components of food security, dimensions of food security, and indicators of food security. It describes about the current status of food security in Bangladesh on the basis of secondary data at macro level and on the basis of primary data at micro level. The study identifies the factors affecting food security as a whole and suggests for policy action for achieving food security of the people of the country particularly of the poor people. For ensuring comprehensive food security factors associated with production, availability, distribution and consumption of food is to be taken into consideration.

Availability of food depends on the domestic production, food import or export and food aid, security stock, exchange of food and the efficiency of distribution through market and other channels. Of these, domestic production is the major concern to ensure food availability at both national and household level. The availability of food depends not only on the production of rice and wheat but also in the production of other major food items, such as potato, pulses, oilseeds, vegetables, fruits, fisheries and livestock products. So, for measuring availability of food it would be quite sensible to take into consideration the total domestic production of food grains, production of substitutes of food grain like livestock, fisheries etc., import of food grains and different types of food aid for the calculation of availability of food. The critical factors which influences the availability of food is the number of total population, population growth, per capita consumption of food and utilization of food grain for further production preserved as seed and losses of food grain due to some obvious reasons like floods, droughts, cyclones and other natural calamities like saline water intrusion in the coastal areas etc.

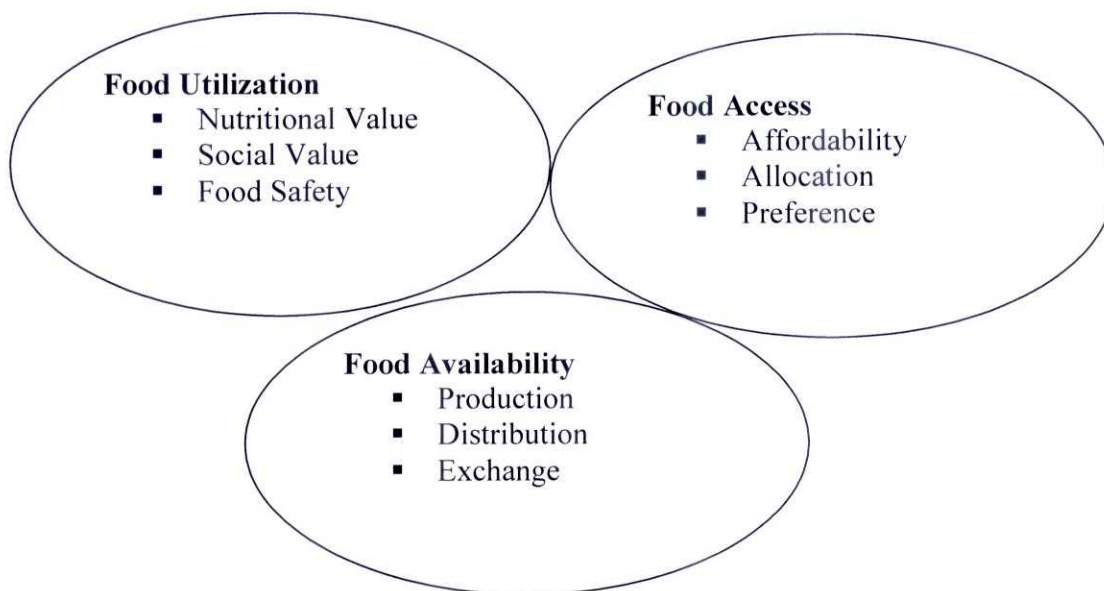
Availability of food grain does not itself guarantee food security for households or individuals. Even when aggregate supplies are adequate, a number of factors may prevent poor households or individuals from having access to required food. These factors are household's income, government transfers, assistance from relatives and friends;

remittance from abroad and assistance from (Non Government Organization) NGOs. Lack of purchasing power, intra household disparity in food allocation, landlessness, seasonal unemployment of agricultural labor, poor wages of labors in industries including readymade garments, rising inflation that erodes the income of the poor, depreciation of taka against dollar at different times, improper functioning of market, unholy alliances of business syndicates and inadequate budgetary allocation to SSNP are factors affecting accessibility of the poor to food.

Utilization of food including nutritional value is another component of food security at national, household and individual level. It is determined by intra household food allocation, dietary habit, storage, processing and cooking practices. Even though a household has enough food at its disposal, it does not necessarily mean that all individuals have the equal opportunity of utilization of food. Conventional food intake pattern in Bangladesh suggests that women and children have less access to food than male members. Dietary imbalance and availability and unavailability of micronutrients are also among the major factors responsible for poor nutritional outcomes. A person can intake relatively greater volume of food but it may contain lower level of nutrient because amount of nutrients depends on what composition of food people eat, given their status of health and sanitation, and other physical and socioeconomic environment. High consumption of cereals but low intake of edible oils, vegetables and fish may result in low level of absorption of micronutrients and high level of anemia and other deficiencies. Due to high intake of carbohydrate rather than a balanced diet a huge number of people are suffering from anemia specially the women. Apart from food preferences, improper processing and cooking, lack of proper sanitation and incidence of parasitic and other diseases may seriously affect utilization of food whatever people acquire through their entitlement.

The components of food security corroborates with the description of the components of food security described by Global Environmental Change and Food Systems (GECAFS). They described the components of food security in 2001 as food availability, food access and food utilization. As per the observation made by GECAFS the components of food security is shown in figure 1.

Figure 1: Components of food system with their main elements



Source: Ingram *et al.* (2005)

With the above diagram it is found that food system composed of different elements with sub-elements which are also different in nature. It indicates the complexity of food system which is very much related to its security. As food security is a cross-sectional and multidimensional issue, its insecurity is also multifaceted. On the basis of the nature of the problem it is primarily divided into two category named as transitory food insecurity and chronic food insecurity. Transitory food insecurity occurs when households face a temporary decline in access to enough food. It can be further divided into temporary food insecurity and seasonal food insecurity. Temporary food insecurity occurs when sudden and unpredictable shocks, such as drought or flood, affect a household's entitlement. Famine is the worst form of transitory food insecurity, which can result from one or more causes like flood, drought, cyclone, crop failure, market failure, loss of real purchasing power by group of households etc.

Seasonal food insecurity occurs when there is a regular pattern of inadequate access to food. *Monga* is an appropriate example of seasonal food insecurity. The term *monga* is not a new phenomenon in rural Bangladesh. It is being reported in dailies, weeklies and monthlies very frequently for the last couple of years. But the topic just

started to catch public interest in the last years. It is defined as 'seasonal food insecurity in ecologically vulnerable and economically weak parts of north-western Bangladesh, primarily caused by an employment and income deficit before *aman* is harvested. It mainly affects those rural poor, who have an undiversified income that is directly or indirectly based on agriculture' (Zug: 2006:2). Chronic food insecurity is termed as when individuals and groups of people suffer from food insecurity for all the time. It affects the households that persistently lack the ability either to buy or produce enough food. Transitory food insecurity may lead to chronic food insecurity, depending on how severe it is and how frequently it occurs. If a household suffers two drought years in a row, and is forced to sell some of its assets to survive, then it may move from a situation of transitory food insecurity to one of chronic food insecurity (Amin & Farid: 2005:2).

Thus food security is mainly related with the availability of food, accessibility of food and utilization of food which is determined by some other factors mentioned above. In this situation the present study covers the availability, accessibility as well as nutritional aspects of food security in Bangladesh. It will search for the factors which may play a vital role in line with policy implication in ensuring food security.

Chapter- Three

Current Trends of Food Security

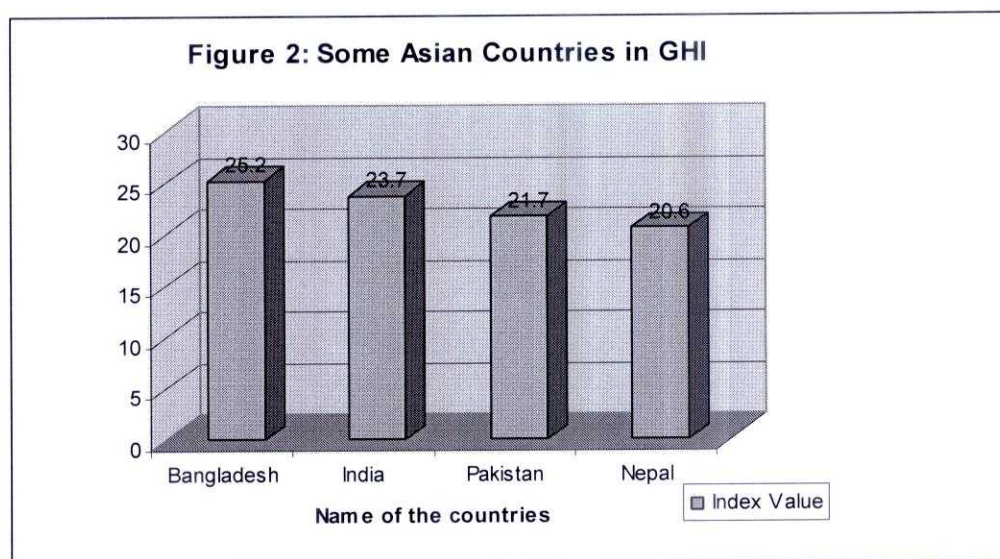
Prelude

In a country of agrarian economy like Bangladesh domestic production of food grain has an important role to play in the quest for food security. As a food producing sector contribution of agriculture to Gross Domestic Product (GDP) is 23.50 percent where as only crop sector contributes 13.44 percent of the countries national GDP (GoB:1999:1). But the natural calamities like recurrent floods, droughts, cyclones, tornados, tidal surges, river bank erosions, water logging and salinity hampers the domestic food production very frequently. With the destruction of domestic food production recurrent flood also severely hits the poor and the landless remaining unemployed for a long period of time. Despite such barriers domestic production has been increased reasonably which is the vital part of food security for a country like Bangladesh with less capacity to import. Along with increased productivity further improvements on access to food and utilization is essential. As ensuring individual need of food is the fundamental spirit of food security so the dynamics of food security is very much related to the fulfillment of basic requirement of food for both household and individual level. It can be done by ensuring all the aspects of food security such as availability, accessibility and utilization of food. To analyze the current status of food security both primary and secondary data has been consulted. Primary data has been collected by survey through a semi-structured questionnaire among 50 respondents in two villages of Sadar upazila under the district of Mymensingh in July, 2009 with the purpose of identifying the current status of food security of the rural people in micro level of the country. Respondents were selected randomly and interviewed with a semi- structured questionnaire prepared to know about the current status of food security of the people from different perspectives. The survey was aimed to know about the population size, entitlement of land, educational status, monthly income and expenditure of the respondents and how these factors influences the availability of food, access to food, and utilization of food. Secondary data was collected from the reports of different HIES and other surveys conducted by different organizations. With the use of both primary and secondary data a comparison was made to get current status of food security as well as the changes in different parameters of food security.

In view of this the current status of food security in Bangladesh is being described in the Global Hunger Index (GHI) standard, domestic food production, food import and food aid, food intake, calorie intake, pattern of food intake, households income distribution, households expenditure, share of food expenditure, households entitlement to land, fluctuation of food price at different periods of the year, share of public expenditure, population growth, prevalence of undernourishment, infant mortality both from micro and macro level. Finally the role of government for ensuring food security of the hardcore and absolute poor among the downtrodden population of the country through the implementation of different food based programs. On the basis of the above mentioned factors the status of food security of Bangladesh has been described under the four main heads which includes some other subheads. The main heads regarding the status of food security has been discussed below are food security in GHI standard, availability of food, accessibility of food and utilization of food both at micro and macro level.

Food Security in GHI Standard

Recently the world is suffering from chronic hunger mostly living in Asia and African countries. Among the 832 million chronically hungry people of the world 65 percent is living in only seven countries: India, China, the Democratic Republic of Congo, Bangladesh, Indonesia, Pakistan and Ethiopia (FAO: 2008:12). International Food Policy Research Institute (IFRI) states that Bangladesh is one of the 33 risky countries regarding food insecurity. IFRI constructed the index for 88 countries with three dimensions of food security: food crisis, malnutrition originating from lack of food and child death. The degree of food insecurity in some Asian countries as measured in the GHI is shown in figure 2.



Source: International Food Policy Research Institute, 2008.

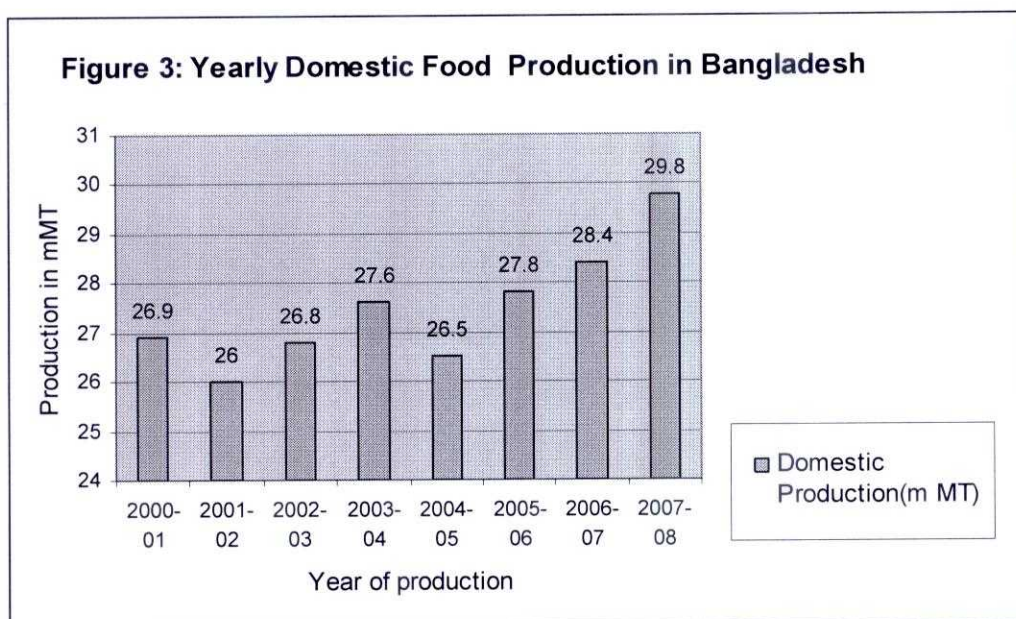
Among the food insecure countries with 5 points Mauritius is at the top of the list of Global Hunger Index, with 25.2 points Bangladesh is at the 70th position. Among the 25 malnourished Asian countries, Bangladesh is in 18th position (Khan: 2008:3). The index value of Bangladesh is shown in Figure 1 along with other south Asian countries like India, Pakistan and Nepal.

Availability of food

Availability of food is one of the key factors determining national food security which is strongly supported by accessibility and utilization of food. Availability of food is mainly determined by domestic production in addition to the amount of food import and food aid.

Domestic food production

In spite of doubling the domestic food production over the last three decades, Bangladesh is still a food deficit country. At present food grain requirement in Bangladesh has been estimated at about 32 million metric tons. Against this in 2007-2008 total production of food grain was 29.7 million metric tons (BBS: 2008-2009). So, there was a shortage of around 2 million metric tons of food grain for the year 2007-08. Trends of food production and food import are shown in Figure 3.



Source: Self compiled from BBS 2006 and BBS 2008-09

Available statistics shows that in early 1970s the domestic food production was less than 10 million metric tons which was more than 29 million metric tons in 2007-08. But the last eight years statistics shows that the increase of food production is not so satisfactory. The increase of food production is only 3.0 million metric tons. Figure 3 shows that in 2000-01 the domestic production of food grain was 26.9 million metric tons and in 2005-06 the domestic production of food grain was 27.8 million metric tons. The increase was only 0.9 million metric tons. But due to increasing population Bangladesh has to import 0.4 million metric tons more every year. On average Bangladesh has a deficit of 1-2 million metric tons of food grain.

Availability of food is also affected by the preservation of food grain which is to be used as seed in the next year's production. Wastage is another factor of gross production of food grain. The conventional practice is to use seed, feed and wastage (SFW) at 10 percent of gross production. FAO estimate showed SFW allowances of 12.5 percent for rice and 20 percent for wheat in Nepal and 11.5 percent in Srilanka (FAO: 1977). Agricultural experts in Bangladesh suggest SWF allowances of at least 12 percent for rice and wheat in the country (Talukder: 2005:38). So, the domestic production based availability of food is also determined by some other factors also like natural calamities, supply of agricultural inputs, preservation for seed and wastage.

Food import and food aid

For the convenience of discussion the issue of food import and food aid has been taken together. Despite increase in domestic production mainly of cereals Bangladesh still is heavily dependant on imports of all food items to meet the demand for growing population. Except shrimp export, Bangladesh is the net importer of all food items. The long term trend of import of major food items is shown in Table 1.

Table 1: Trends of imports of major food items (000 tons)

Food Item	1980-82	1990-92	1999-01	2005-06
Rice	295	140	872	543
Wheat	1366	1413	1969	1249
Pulses	3	113	245	-
Milk	211	291	334	56
Edible Oil	104	297	904	687
Sugar	56	65	230	-
Fruits	18	28	108	-

Source: FAO: 2004, Food Balance Sheet and BBS: 2007 a: 276

It can be noted from the table 1 that the amount of import shows an upward trend over the time. Although the trend of domestic food production is favorable for last 38 years especially in rice production, Bangladesh is not yet self-sufficient in cereal grains. The import of rice remains stagnant at around 0.5 million metric tons per year, with substantial amount of wheat import. In the year 1980-82 the average volume of wheat import was 1.4 million metric tons which increased in 2000-01 to 2.0 million metric tons. Although in year 1999 and 2001 following bumper harvest government declared achieving self sufficiency in rice production, but the amount of food grain import was also around 2.8 million metric tons. So, it depicts that in the year of sufficient rice production Bangladesh remain also a food grain importing country. In a normal year, Bangladesh imports rice from 0.3 to 0.7 million metric tons but in year of natural calamities it increases up to 1.5 million metric tons. On the other hand, wheat import is around 1.7 to 2.1 million metric tons (Mandal: 2009). As the population is increasing at the rate of 1.50 percent per year but the production of food grain along with others is not increasing at the same rate. From the above figure it is found that in the year 2006-07

Bangladesh imported rice and wheat of 2.3 million metric tons and in 2007-08 imported 3.5 million metric tons of food grains following two floods and cyclone Sidre in 2007. At the same time the amount of food aid has been decreased. The other food items for which imports have been growing very fast are pulses, milk, edible oil, sugar and fruits. Table shows that the volume of import of pulses was 3 thousand metric tons in 1980-82 which has raised to 245 thousand metric tons in 1999-2001. In 1980-82 the volume of milk import was 211 thousand metric tons which has increased to 334 thousand metric tons in 1999-01 and then fallen continuously to 2004-05 remaining at 56 thousand metric tons. Increase in import of edible oil, sugar and fruits have been growing faster. In 1980-82 the volume of import of edible oil, sugar and fruits were 104, 56 and 18 thousand metric tons which have increased to 904, 230 and 108 thousand metric tons respectively.

In the long run context along with domestic production and food import food aid has played important role in meeting the domestic food demand. In the early years of independence, the country faced major food deficits, most of which was taken care of through grain imports from the United States under the PL 480 program. Between 1975 and 1977, more than 1.3 million metric tons of food grains came into Bangladesh as food aid, which was more than 85 of the total inflow of food grain (Shahabuddin *et al.*:2005:108). Increases in domestic production and augmented capacity of the government to import food grains commercially have resulted in the downward trend in food aid in recent years. Price hike in the international market is one of the reasons for decreasing food aid from the international communities. Presently, this share has come down to less than 35 percent of total cereal imports with wheat accounting for 98 percent of the total food aid. Soaring prices of rice has also made negative impact on rice import. Bangladesh imports rice from India, Thailand, Vietnam and Myanmar but that is becoming increasingly restricted. Vietnam has set the price at \$ 460 per ton, which is a rise of more than 50% from a year ago. Thailand is now selling its rice for more than \$500 a ton, which was \$ 325 ton a year ago. India after a vigorous persuasion it has agreed to export 500 tons of rice at \$ 505 which was \$ 424 per ton a year ago. Finally in April, 2008 the prices of rice rose rapidly reaching at \$ 1000 per ton in international market and worsen the food security of the food deficit country (Daily Star: 2008). Soaring prices has shocked especially the poor people of the country

Access to food

Access to food, which is another import component of food security, is determined by the household's entitlement of land and other asset bases, level of poverty, size of the household population, household's income and expenditure, market prices of food, level of education, relief and subsidies provided by the government. The distribution of income and an individual's ability to access to food is the outcome of complex operation and interactions of all those elements. In line with the above discussion this section discuss about the entitlement of land, level of poverty of the household, households income and expenditure and the distribution of households income both at micro and macro level on the basis of primary and secondary data.

Households entitlement of land

Historically in Bangladesh land poor are the poor in general. So, the entitlement of land is directly correlated with poverty and food security. The entitlement of food based on household's own production, which is relevant for the farm population, would depend on the access to land. In Bangladesh, land resources are extremely scarce and have been shrinking under pressure of growing population. The reports of the Agricultural Censuses of Government of Bangladesh published in 1987 and 1999 as cited by Hossain *et al.* show the land area operated by rural households has declined from 9.2 million ha in 1983-84 to 8.2 million ha in 1996, indicating that on average 82000 ha of land is going out of cultivation every year. In percentage every year 1 percent of agricultural land is being converted into non-agricultural land. At the same time population is increasing at the rate of 1.50 percent per year (BBS: 2007a:127).

Percentage share of population below the poverty line by size of owned land in rural areas is presented in Table 2.

Table 2: Share of poor population by size of owned land in rural area

Size of land owned (Acre)	<2122 K. cal Absolute poverty	<1805 K. cal Hardcore poverty	<1600 K. cal Ultra poverty
2005			
Landless	59.57	33.15	15.26
0.01-0.49	47.87	23.61	9.57
0.50-1.49	36.97	14.52	4.60
1.50-2.49	32.10	11.19	3.59
2.50-7.49	23.35	7.32	1.61
7.50+	12.34	5.45	2.74
2000			
Landless	55.9	27.8	15.6
0.01-0.49	48.7	23.4	9.1
0.50-1.49	37.7	14.9	6.1
1.50-2.49	31.1	9.5	1.8
2.50-7.49	25.3	8.2	2.5
7.50+	15.2	2.7	1.7

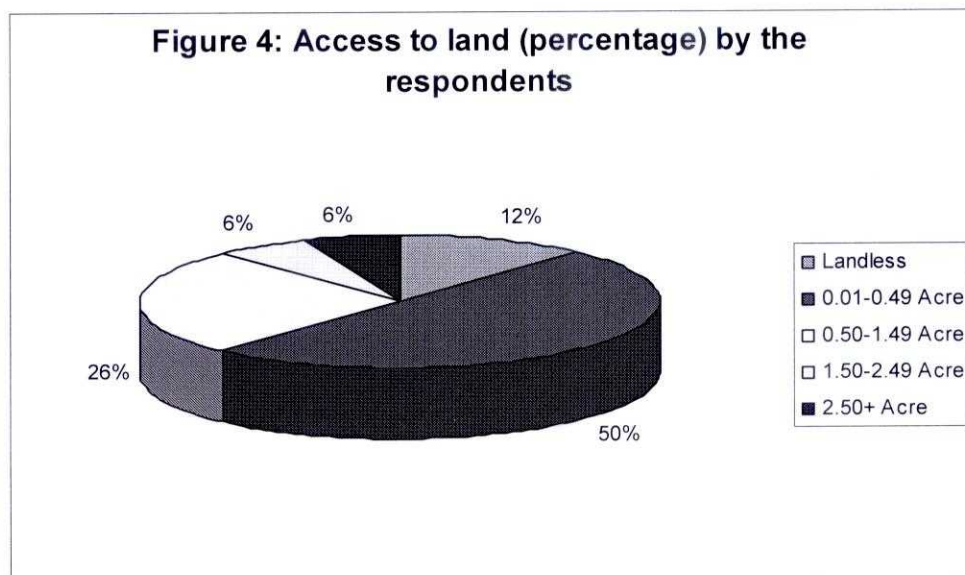
Source: BBS: 2007:75

Table 2 shows the information on absolute poverty, hardcore poverty and ultra-poverty by the size of owned land in rural area. All the three parameters show a strong negative correlation with the size of the land owned in 2005 and in 2000. It shows that the hardcore poverty increased but ultra-poverty decreased for the landless in 2005 over the year 2000. It also shows that except for the range of land owned 0.50-1.49 acre, hardcore poverty increased for all other cases in 2005 over 2000. But in case of ultra poor it varies for different ranges of land owned people. In case of landless it has decreased in 2005 over 2000. But in case of 0.01-0.49 acre, 1.50-2.49 acre and 7.50 acre intensity of ultra poverty has increased in 2005 over 2000. At the same time it has decreased for the range of land owned from 0.50-1.49 acre and 2.50-7.49 acre. In case of absolute poverty

it has increased among the landless, but decreased among the people holding land of 7.50 acres and above in 2005 over 2000.

Level of poverty has a direct relation with the access to asset base mainly access to land. To get the statistics regarding the amount of food intake, percentage of people and the size of the population are discussed before discussing the average per capita per day food intake by the respondents. All these three factors are discussed one after another for the convenience of discussion. In the last part of discussed primary data has been compared with the secondary data regarding access to land and poverty which influence the access to food.

Data regarding the possession of land in percentage is shown in figure 4.

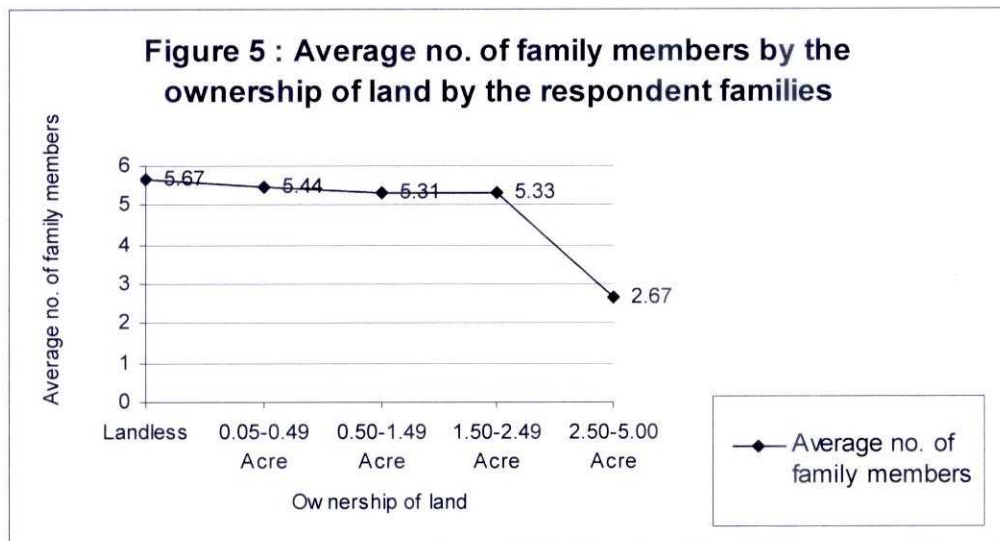


Source: Self Compiled

The figure shows that among the respondents 12 percent families are landless, 50 percent which is the half of the respondents have only 0.05 to 0.49 acres of land, 26 percent respondents have 0.50 to 1.49 acres of land, 6 percent respondents have 1.50 to 2.49 acres of land and another 6 percent respondents have a land of 2.50 to 5.00 acres.

As population has direct impact on the household's access to food. Generally in Bangladesh against the poor possession of land, average size of the households is large. Statistics show that average household size of Bangladesh is 4.9 and the average size of the household in Mymensingh district is 4.6 (BBS: 2007a:88, 89). But in the study area the size of the average household was more than that of both national and district

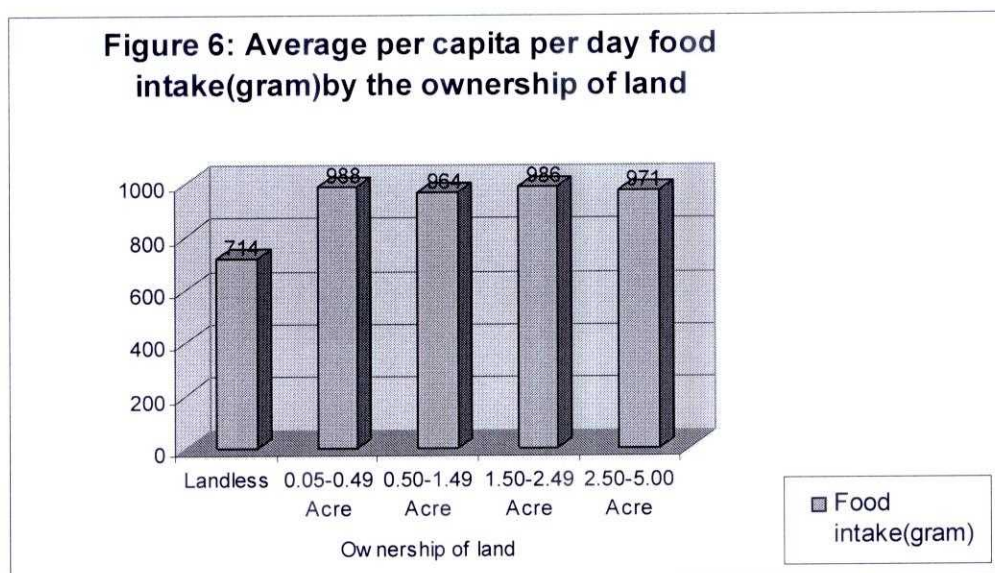
average. It is found that average size of the household in the surveyed area was 5.28. Against high population the possession of land per household was less. The average number of family members and the possession of land by the respondent families are shown in figure 5.



Source: Self Compiled

Figure shows that families with less area of land have more population. It is found that landless families have average population of 5.67; where as, families with 2.50- 5.00 acres of land have average population of 2.67. As the families with less area of land with more population, so they suffer from food insecurity. It is supported by the amount of food intake by the ownership of land. Against the ownership of land average food intake is shown in figure 6.

Figure 6: Average per capita per day food intake(gram)by the ownership of land



Source: Self Compiled

Figure shows that families with less area of land having large number of family members suffer from food insecurity. From the figure it is found that landless are the most food insecure. On average they can intake only 714 gm of food per capita per day against the recommended level of 934 gram per capita per day. The rest of the groups' intake is more than the recommended level but imbalanced due to high intake of carbohydrates. The above statement also corroborates with the national food intake by different area of land owned group. National statistics shows that among the landless 59.57 percent are absolute poor, 33.15 percent are hardcore poor and 15.26 percent are ultra poor where as among the highest land owner group only 12.34 percent are absolute poor, 5.45 percent are hardcore poor and 2.74 percent are ultra poor respectively. As poverty is another indicator of access to food, so from the above discussion it is clear that in Bangladesh those who are landless they are generally poor and have poor access to food.

Poverty

Level of poverty indicates the status of household's access to food. The level of poverty varies from house to house. It has also a regional dimension of household poverty. Estimates of Head Count Rate (HCR) and regional incidence of poverty using Cost of

Basic Needs (CBN) method of HIES, 1991-92 to 2005 incidence of poverty for upper and lower poverty lines are given in Table 3.

Table – 3: HCR of incidence of poverty

Residence	Upper poverty line				Lower poverty line			
	2005	2000	95-96	91-92	2005	2000	95-96	91-92
National	40.0	48.9	50.1	56.6	25.1	34.3	35.1	41.0
Rural	43.8	52.3	54.5	58.7	28.6	37.9	39.4	43.7
Urban	28.4	35.2	27.8	42.7	14.6	20.0	13.7	23.6

Source: BBS: 2007: 57

The statistics shows that using the upper poverty line in 2005, the incidence of poverty were estimated at 40.0 percent at national level, 43.8 percent in rural area and 28.4 percent in urban area and in 2000 the incidence of poverty were estimated at 48.9 percent at national level, 52.3 percent in rural area and 35.2 percent in urban area. It shows the reduction by 8.9 percent point at national level, 8.5 percent point in rural area and 6.8 percent point in urban area over the period 2000 to 2005. Using the lower poverty line, in 2005 the incidence of poverty was estimated at 25.1 percent at national level, 28.6 percent in rural area and 14.6 percent in urban area and in 2000 the incidence of poverty was estimated at 34.3 percent at national level, 37.9 percent in rural area and 20.0 percent in urban area. It shows the reduction by 9.2 percent point at national level, 9.3 percent point in rural area and 5.4 percent point in urban area during the period 2000 to 2005. Using the upper poverty line, the estimate of poverty incidence was estimated at 56.6 percent in 1991-92, whereas, it was estimated at 40.0 percent in 2005. It recorded a 16.6 point percent reduction during this period. On the other hand, using the lower poverty line, the incidence of poverty was estimated at 41.0 percent in 1991-92, whereas, it was recorded at 25.1 in 2005, a reduction of 15.9 percent point during this period. But the incidence of lower poverty line at national level estimated 25.1 percent in 2005 is still high. The level of incidence of poverty also varies from division to division. Divisional incidence of poverty using upper poverty line is shown in Table 4.

Table 4: Divisional HCR of incidence of poverty using the upper poverty line

Division	2005			2000		
	National	Rural	Urban	National	Rural	Urban
Barisal	52.0	54.1	40.4	53.1	55.1	32.0
Chittagong	34.0	36.0	27.8	45.7	46.3	44.2
Dhaka	32.0	39.0	20.2	46.7	55.9	28.2
Khulna	45.7	46.5	43.2	45.1	46.4	38.5
Rajshahi	51.2	52.3	45.2	56.7	58.5	44.5
Sylhet	33.8	36.1	18.6	42.4	41.9	49.6

Source: BBS: 2007:58

Table 4 shows that in 2005, the estimate of the HCR using the upper poverty line Barisal division had the highest incidence of poverty, estimated at 52.0 percent followed by Rajshahi and Khulna division measuring 51.2 and 45.7 percent respectively. On the other hand Dhaka division recorded the lowest HCR of incidence of poverty at 32.0 percent followed by Sylhet division 33.8 percent and Chittagong division 34.0 percent. Divisional incidence of poverty using lower poverty line is shown in Table 5. Table 5 shows that using the lower poverty line in 2005, Chittagong division had the lowest incidence of poverty of 16.1 percent, followed by Dhaka and Sylhet divisions with poverty levels of 19.9 and 20.8 percent respectively.

Table 5: HCR of incidence of poverty by division using the lower poverty line

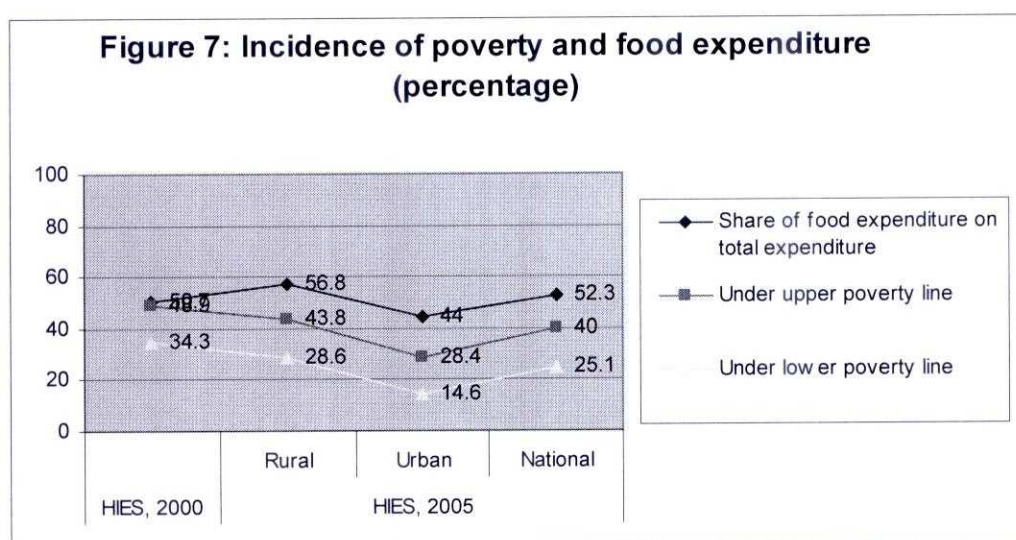
Division	2005			2000		
	National	Rural	Urban	National	Rural	Urban
Barisal	35.6	37.2	26.4	34.7	35.9	21.7
Chittagong	16.1	18.7	8.1	27.5	30.1	17.1
Dhaka	19.9	26.1	9.6	34.5	43.6	15.8
Khulna	31.6	32.7	27.8	32.3	34.0	23.0
Rajshahi	34.5	35.6	28.4	42.7	43.9	34.5
Sylhet	20.8	22.3	11.0	26.7	26.1	35.2

Source: BBS: 2007:58

The striking feature was that urban poverty of Dhaka and Chittagong division was remarkably lower in 2005 which was 9.6 and 8.1 percent respectively. The lower incidence of urban poverty in Dhaka and Chittagong division may be due to more employment opportunities than other divisional and district level urban centers. The other reasons may be comparatively strong asset base with government and non-government interventions in those regions. Incidence of poverty has another dimension to food security. Although the overall incidence of poverty has been decreased in Bangladesh, it is still alarming. The statement is paradoxical because with the decrease of poverty the share of food expenditure has been increased.

Another negative aspect of the increase of share of food expenditure is that with the increase of share of food expenditure other, expenses for the fulfillment of other basic needs will be decreased. When the expenditure for the fulfillment of other basic needs will be reduced the desired living will be hampered which will eventually create different types of health and sanitation hazard. Less expenditure on education and sanitation will hamper the development of life. Thus level of poverty in many ways related to the food intake and food utilization.

The level of incidence of poverty with the share of food expenditure is shown in Figure 7.



Source: Self Compiled based on HIES, 2005

Figure shows that the share of food expenditure has been increased from 50.7 percent to 56.8 percent from 2000 to 2005. Figure shows that in 2005, the share of food

expenditure in rural areas was more than the share of expenditure in the national and in urban area the share of food expenditure is 44 percent which is less than the share on national average of 52.3 percent.

Income and expenditure of the households

The access to food, along with other economic indicators, is largely determined by the income, expenditure of the household. Access to food is described by the Noble Laureate Amartya Sen (1982) as 'food entitlement'. Entitlement of food or access to food depends on production, market price of food, scope and opportunity cost of household and individual labor force and inheritance of property. The distribution of income and an individual's ability to access to food is the outcome of the complex operation and interactions of all those elements. The disparity in the share of income and expenditure is presented with the use of Gini Co-efficient. The more the value of Gini Co-efficient the more inequality exists in the distribution of income. This is more persistent in the developing countries of the world like Bangladesh. The values of Gini co-efficient are shown in Table 6 to discuss about the trends of income inequality from 1983 to 2005 with the use of different survey reports.

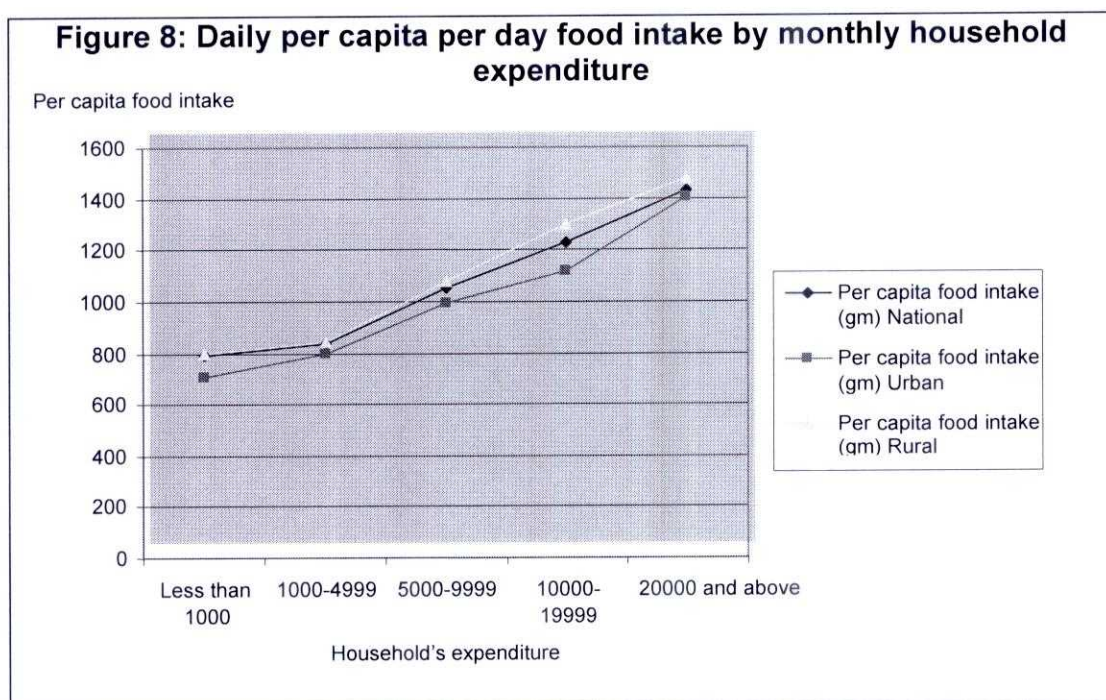
Table 6: Income Gini Co-efficient from 1983-2005

Year of Survey	Income Gini Co-efficient	
	Rural	Urban
1983-84	0.246	0.298
1988-89	0.265	0.326
1995-96	0.384	0.444
2000	0.393	0.497
2005	0.428	0.497

Source: BBS: 2007:28 and BBS: 2003:21

Table 6 shows that the incomes are highly unequally distributed and have been worsening day by day. The concentration of income, as measured by Gini co-efficient, was estimated 0.246 for rural areas and 0.298 for urban areas in 1983. The more the value of Gini co-efficient, the more the inequality is. From the table it is clear that the increase in income inequality was moderate in the 1980s, but was very fast in the 1990s. As compared to 1983-84, in 2005 the percentage of Gini co-efficient in rural areas has

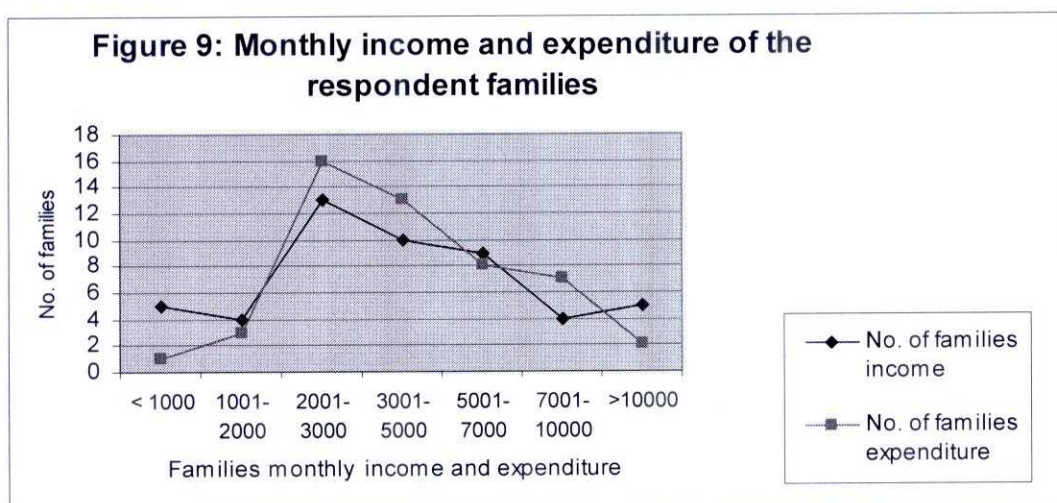
increased to 74 percent and in urban areas it has increased to 67 percent. It indicates the distribution of income is becoming more unequal. The data shows that in 2000 the lowest 5 percent people had 0.93 percent of income which has decreased in 2005 at 0.77 percent. In 2005 the top 5 percent had 26.93 percent of total income, where as lower 5 percent had 0.77 percent share of total income(BBS: 2007: 28). It clearly depicts the gravity of disparity of income. Even the average per capita calorie intake is satisfactory, but income disparity seriously hampers the food security. Against a satisfactory level of food intake required for balanced nutrition for a healthy and working life there exists a serious disparity in per capita per day food intake for different classes of people. It has also a regional dimension. Income inequality varies in different parts of the country as well it varies in rural and urban areas also. Generally rural people earn less and urban people earn more. National income per capita per household lies in between rural and urban household income. Accordingly a household food intake varies as per their monthly income and expenditure. Average per capita per day food intake by different classes of people by monthly household expenditure for rural, urban and national level is shown in figure8.



Source: Self compiled from BBS: 2007: 303,304

Figure 8 shows that per capita per day food consumption of the lowest expenditure group was about half of the consumption of the highest expenditure group for rural, urban and national level. At rural level the gap of per capita per day food intake between the lowest and highest level is 679 grams per capita per day which in urban area is more pronounced. In urban area the lowest expenditure group whose monthly expenditure is less than Tk.1000 per month per household consuming as lower as 707 grams per capita per day compared to 1403 grams per capita per day consumed by the highest expenditure group spending Tk.20000 and above per household per month. At national level, the lowest expenditure group of less than Tk.1000 per household per month is consuming only 788 grams per capita per day compared to 1432 grams per capita per day consumed by the highest expenditure group. This inequality of consuming food by different expenditure groups creating disparity among the higher and lower income groups in per capita per day calorie intake leading to malnutrition. The upper expenditure group is taking more calorie than required leading to obesity which is also against the concept of active and healthy life. Thus both the upper and lower expenditure groups in another way to say lower and upper income groups are suffering in different ways compared to smooth physiological norms of health leading to food insecurity.

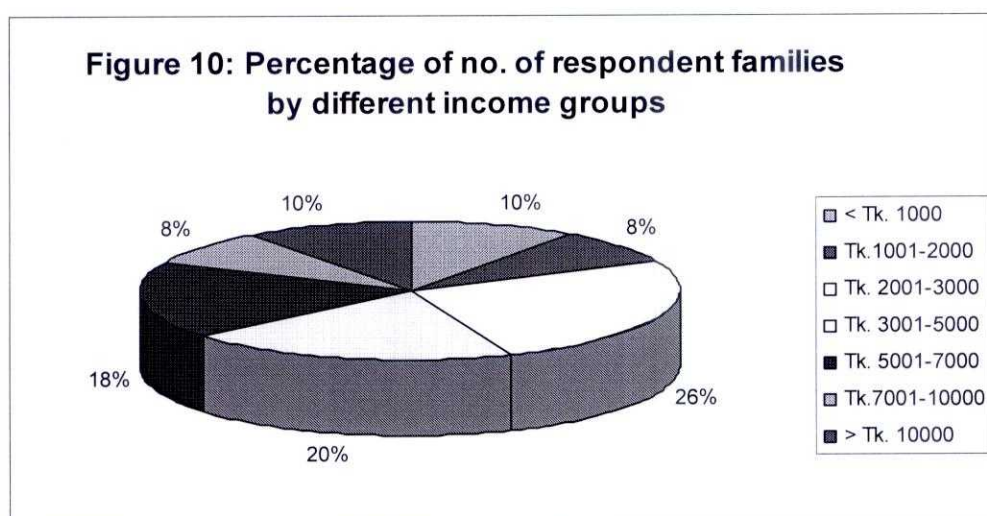
Due to pervasive poverty with low asset base and low income most of the households spend more than their income. The status of monthly average income and expenditure of respondent's households is shown in figure 9.



Source: Self Compiled

The above statement is corroborated by the primary data. Figure shows that most of the families spend more than their monthly income. Only families in the income group less than 1000, 1001-2000, 5001-7000 and more than 10000 spend less than their monthly income, but their number in the surveyed people is less. It indicates that as many of the families are spending more than income, so they are not able to purchase enough food as they required. It is also affected by sudden price rise of the commodity, frequent inflation and rising population of the household. As the price affects the households purchasing power, so families with less income suffer more from food insecurity.

Using the equation of Anderson and Roumasset the status of food security of the respondent families can be calculated. As per equation families with bigger left hand side than the right hand side of the equation are food insecure. It indicates that food purchased requirement of these families are more than their income and liquid assets available to purchase food. At the same time price hike at different periods both at national and international market makes the left hand side more unequal. As a result the people of mid-income group are the most vulnerable to food insecurity in the rural area of Bangladesh. In addition to income and expenditure percentage of respondents of different income groups illustrates the status of food security more specifically. The number of respondent families by different income groups is shown in figure 10.



Source: Self Compiled

Figure shows that 44 percent of the respondent family's income is below 3000 taka per month. Among the respondents largest number, 26 percent of the respondent households earn only from 2001 to 3000 taka. The next 18 percent of the respondent's household earns only 5001 taka to 7000 taka. Among the respondents only 10 percent families earn more than 10000 taka per month and the next 8 percent of the total respondent household earns taka from 7001 to 10000 taka. Against a poor monthly income with huge population families suffer from starvation or remain underfed.

Prices of food grain

Maintaining prices of staple food grains within affordable limit is an important element of food security in a low income country like Bangladesh. Given the level of income, the lower the prices, the higher is the purchasing capacity of that income. But recently rapid rising in international agricultural commodity prices have pushed up prices of basic food items in local market also. World Bank study shows that food grain prices have more than doubled since January 2006. Over 60 percent of this increase has occurred since January 2008 alone. Individual grain staple prices have increased even more, with monthly average wheat prices doubling and soybean oil prices up by 165 percent since January 2006. Rice prices shot up from \$376 per ton in January 2008 to over \$1000 in April (World Bank: 2008: 6).

FAO report shows that in the short term, the vast majority of poor urban and rural households are hit hardest by higher prices. Among the poor, it is the landless and female headed households that are most vulnerable to sharp rises in basic food prices. The relative impact is not uniform, even among poor households; it varies on a number of factors. Statistics shows that in Bangladesh in the year 2000 among all households 76.8 percent people were the net buyers of staple food where as it were 72.0 and 95.9 percent in rural and urban areas respectively. Among the poor households 84.2 percent were the net buyers of staple foods. In rural areas 83.4 and in urban areas 95.5 are the net buyers among the poor households (FAO: 2008: 22). A recent analysis by Bayes and Hossain based on a nationwide survey cited by M. A. Sattar Mandal in his work reveals that a 50 percent increase in rice price takes away 25 percent of poor household's income, meaning a negative effect on meeting other basic needs. The researchers analysis on 120

households in September 2008 shows that average quantities of rice and protein rich foods have significantly fallen in 2008, compared to 2007 and that 72 percent families have not only consumed lesser foods but also lower rice (Mandal: 2009: 58). It is also corroborated by another research done by UNICEF, WFP and Institute of Public Health and Nutrition. The study report reveals that presently 25 percent families are food insecure. All over the country families are spending 62 percent of their income for purchasing food. Among them lower class labor families are spending 76 percent of their income for purchasing food (Naya Diganta: 2009). Due to price hike 20 lac children are not getting sufficient nutritious food and suffering from malnutrition at the age of 6 months to 5 years. 5 lac children are suffering from long-term malnutrition due to insufficient food. More than 37% children are living with underweight. Research shows that the children of Barisal and Rajshahi are the more sufferers (Prothom Alo: 2009). Thus price hike in the national and international market seriously affecting the poor to meet up their daily requirement of food leading to food insecurity.

Social Safety Nets

In a disaster prone country like Bangladesh social safety net programs are must to insulate the poor and vulnerable from shocks of the sudden natural disasters like cyclones, tornadoes, flood, draughts etc. In addition, riverine Bangladesh also witnesses frequent land erosion causing thousands to lose their land every year. It is also essential to help those who are very frequently food insecure. Against such backdrop there are a number of safety net programs are being implemented for ensuring food security of the poor and the distressed. These include Food for Work (FFW), Food for Education (FFE), Vulnerable Group Development (VGD), Vulnerable Group Feeding (VGF), Test Relief (TR), Gratuitous Relief (GR) etc. Some of these programs have explicit development objectives such as rural infrastructure development (Hossain and Akash: 1993) boosting primary school enrolment rates and human capital development.

The quantum of public expenditure on safety net programs in Bangladesh have more than double over the last decade. This is largely because of the expansion of FFW and introduction of FFE since the mid 1990s. The amount of distribution of relief has been increased in different sectors. For example, in 1999-2000 the amount of VGF

distributed was 149 thousands metric tons and the amount of TR was 25 thousand metric tons (World Bank: 2003). In 2009-10 the target of distribution of VGF is 550 thousand metric tons and the target of distribution of TR is 400 thousand metric tons (Janakantha: 2009). In 2009- 2010 the number of VGF card has been increased 25 percent in comparison to 2008-2009. In 2009-2010 the target of food distribution has been fixed at 2675 thousand metric tons. Among that 2300 metric ton has been allotted only in the social safety net programs. In year 2009-2010 the allotment in VGF is 550 thousand metric tons, in VGD 265 thousand metric tons, in FFW 375 thousand metric tons, in TR 400 metric tons and in GR 64 metric tons and 75 tons in other sectors (Janakantha:2009). In addition to this Tk. 1176 crore has been allotted for the hard core poor. Recently government has declared to provide sufficient food for the people of the southern region of the country who are the worst victim of the cyclone '*Aila*' (Nayadiganta: 2009). Thus social safety net programs are helping the poor to ensure their food security at least at the minimum level.

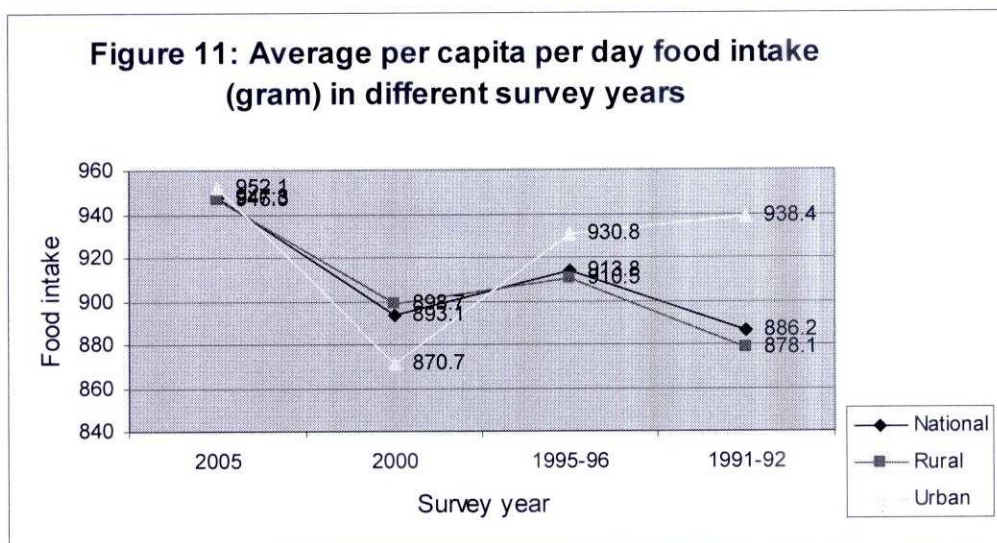
Utilization of food

Food is consumed by every individual as an essential item for living as well as for an active and healthy life. In Bangladesh, food accounts for bulk of the household expenditure of the poor. The poorest 40 percent of the household spends their 68.7 percent of their total income on food (BBS: 2007:41). In spite of this, many of the family can hardly take a balanced diet as a meal. Utilization of food and intake of a balanced diet is governed by a number of factors such as household's food intake, calorie intake, preference of food, knowledge on health and sanitation, processing and preservation of food and finally how and in which environment food is consumed.

Food and calorie intake

Consumption of food and nutrient indicates the status of food security of different socio-economic group of people. Data of different HIES is presented in figure 11 and 12. The figures show the trends of food and calorie intake in different survey years from 1991-92 to 2005. Figure 11 shows the pattern of food intake for different period for rural, urban

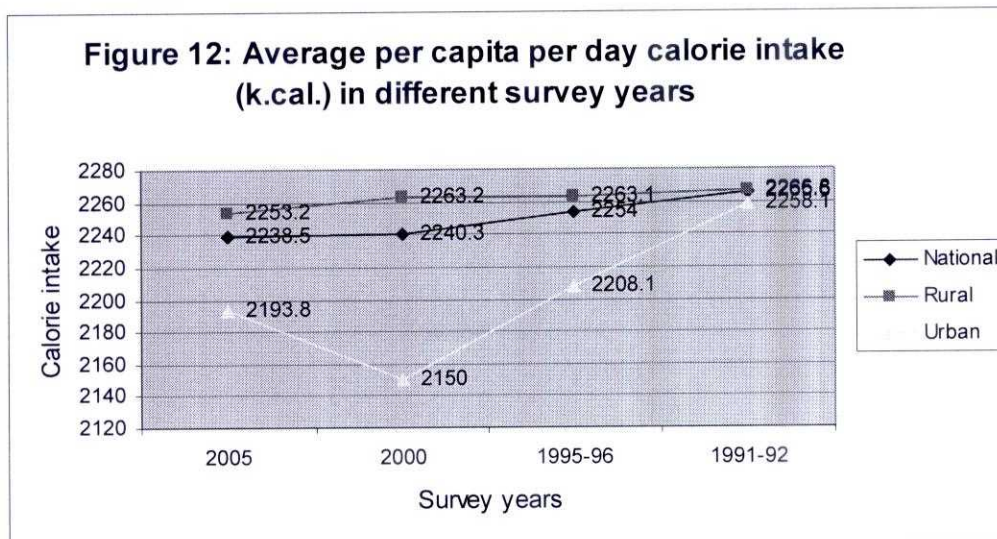
and national level and figure 12 shows the pattern of per capita per day calorie intake for rural, urban and national level from 1991-92 to 2005.



Source: BBS: 2007:43

Figure 11 shows that in 2005 at national level the average consumption of food were 947.8 grams per capita per day which was 893.1, 913.8 and 886.2 grams per capita per day in 2000, 1995-96 and 1991-92 respectively. The survey years shows an uprising trend of food intake from 1991-92 to 2005 except for the year 2000 which shows a declining trend from 1995-96. In 1991-92 the consumption of food at rural level was 878.1 grams per capita per day which rises to 946.3 grams per capita per day in 2005. In urban area in 1991-92 the average per capita per day food intake was 938.4 grams which rises to 952.1 grams per capita per day in 2005. Food intake at national level per capita per day has increased by 6.12 percent in 2005 over 2000. This is probably due to the increase of household's income over the time. In 2000 average households income was Tk.5842 per month which was Tk.7203 per month in 2005 (BBS: 2007:26). At the same time average expenditure also has increased from Tk.4096 to Tk.4881 in 2005 over 2000.

Average per capita per day calorie intake during different survey years with urban-rural break down shows the trend of food security of the people. It is shown in Figure 12.

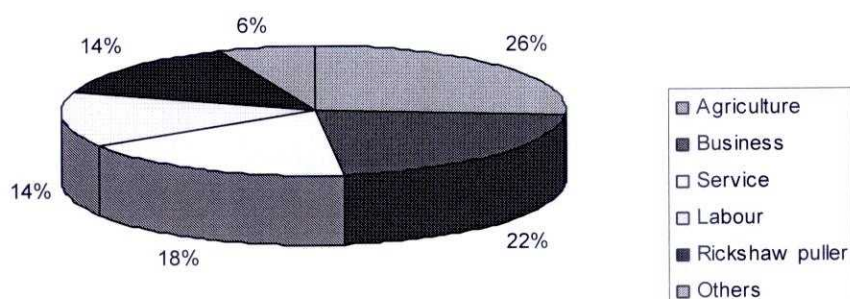


Source: BBS: 2007:46

The figure shows that at national level average calorie intake was estimated at 2238.5 k. cal per capita per day in 2005 which was 2240.3 k. cal, 2254.0 k. cal. and 2266.8 k. cal. in 2000, 1995-96 and 1991-92 respectively. The rural pattern of calorie intake is mostly similar to that noticed at the national level. It was 2253.2 k. cal. in 2005, 2263.2 k. cal. in 2000, 2263.1 k. cal. in 1995-96 and 2266.8 k. cal. in 1991-92. From the figure it is clear that calorie intake has been reduced from 1991-92 to 2005 both at national and rural level. In urban area, the intake of calorie shows ups and downs over the periods. It was 2193.8 k. cal. in 2005, 2150.0 k. cal. in 2000, 2208.1 k. cal. in 1995-95 and 2258.1 k. cal. in 1991-92. The graph shows the downward trends of urban calorie intake from 1991-92 to 2000 and again in 2005 it shows the upward trend of calorie intake per capita per day which reaches to 2193.8 k. cal. Although the average calorie intake was always more than standard of 2122 k. cal. set by FAO, but income disparity among the rich and poor severely affect the food security of the country as a whole especially of the poor. The amount of food intake varies in income of the household, occupation of the household and educational level of the household. The status of consuming food by different households is described below from these aspects.

The percentage of respondents by different occupations is shown in figure 13.

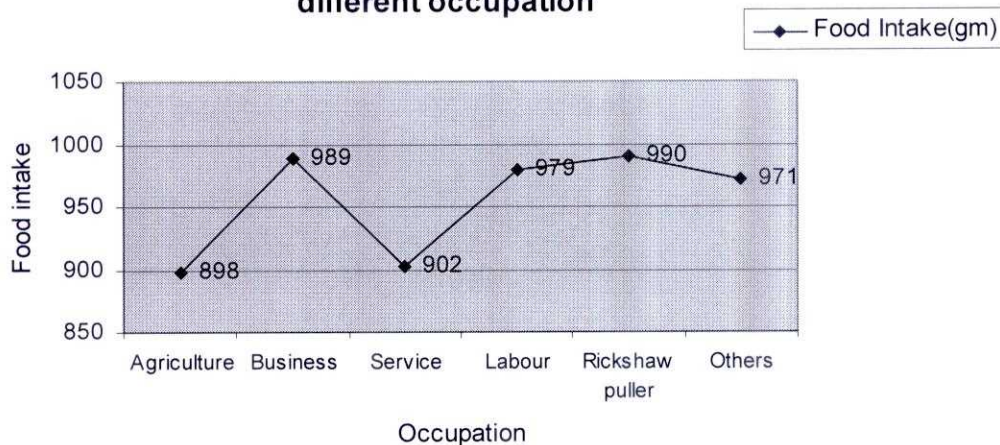
Figure 13: Percentage of respondents by different occupations



Source: Self Compiled

Figure shows that among the respondents 26 percent earn their livelihood from agriculture followed by a group of people engaged in small business contain 22 percent of the respondents. Regarding food intake primary data corroborates secondary data in many ways. As amount of food intake is one of the most important indicators of food security, so, in response to a question either they get sufficient food or not, 68 percent can afford three meals a day and 32 percent can afford only two meals a day. It corroborates with the data that nearly 40 percent of the total population are the hardest victim of food insecurity. Average food intake by different occupation is shown in figure 14.

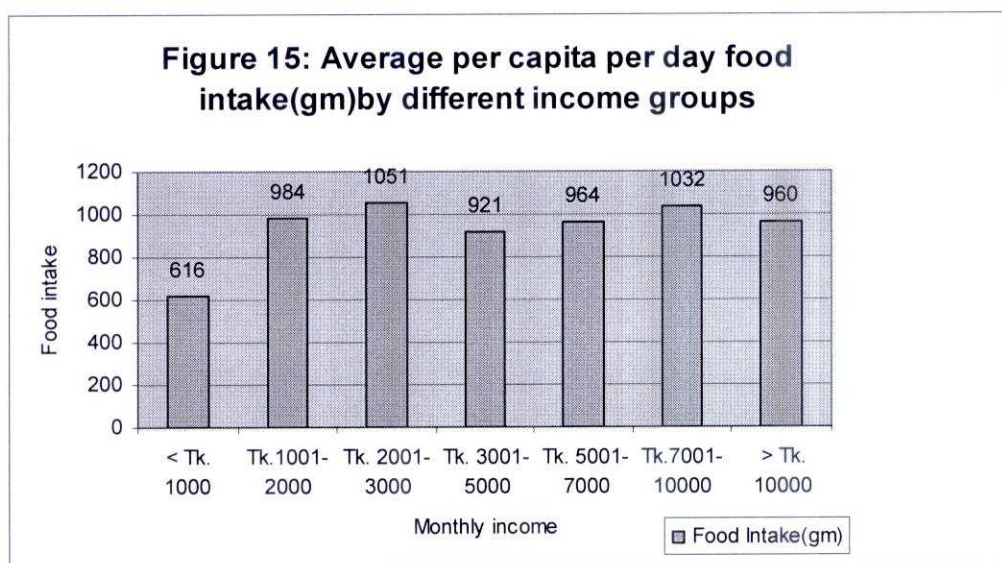
Figure 14: Average per capita per day food intake(gm)by different occupation



Source: Self Compiled

Figure shows that among the respondent's farmers food intake is the lowest which is 898 gm per capita per day followed by the service holders whose average food intake per capita per day is 902 gm. Both of the groups' average per capita per day food intake is much less than the average of national food intake in 2005. It indicates that in respect of average intake of food both the farmers and service holders are seriously suffering from food insecurity.

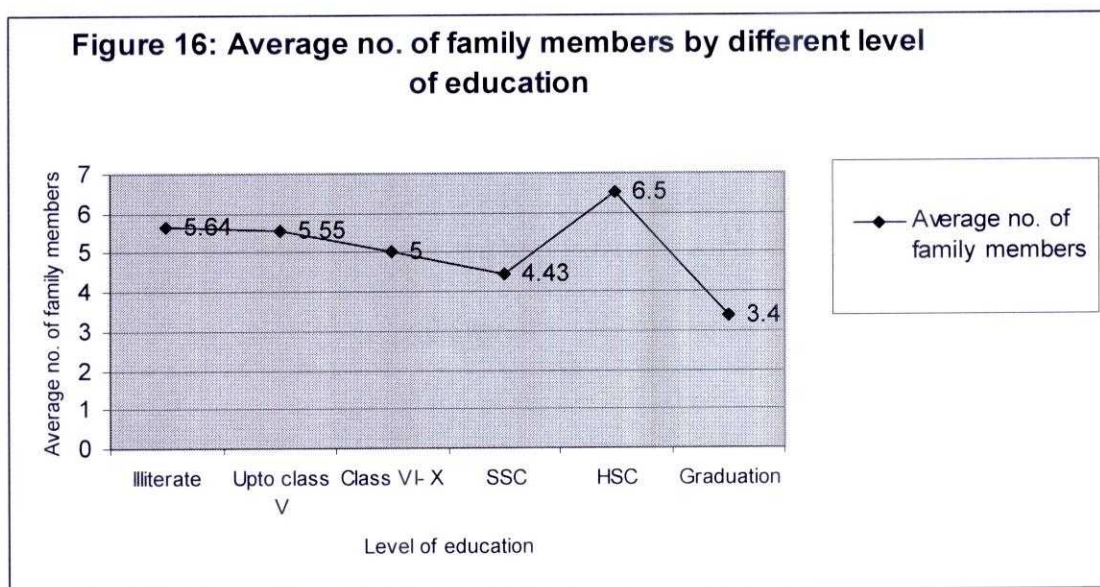
Average food intake by different income groups is shown in figure 15.



Source: Self Compiled

Figure shows that average per capita per day food intake varies among different income groups. People with monthly income less than 1000 taka are the most victim of food insecurity. They can intake only 616 gm of food per capita per day which is far less the national average of food intake of 947.8 gm per capita per day in 2005. Among the rest of the population, except for the people, with a monthly income of 3001-5000 taka can intake a food per capita per day more than the average national food intake.

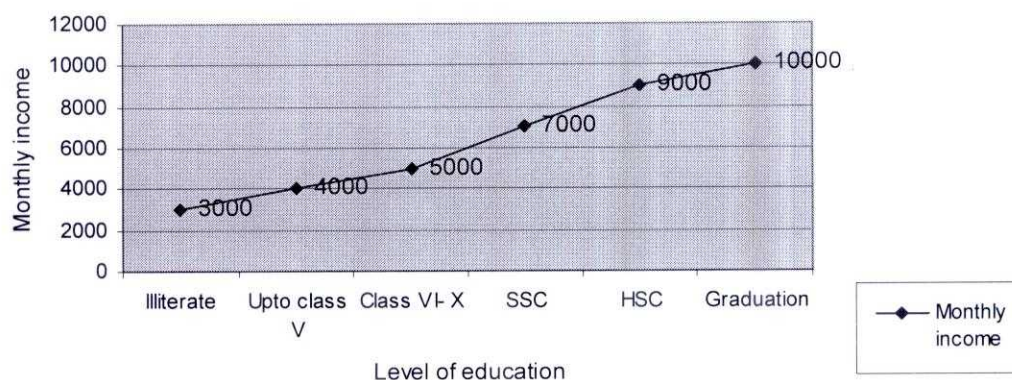
Education has a direct impact on population growth. Average number of family members by different level of education is shown in figure 16.



Source: Self Compiled

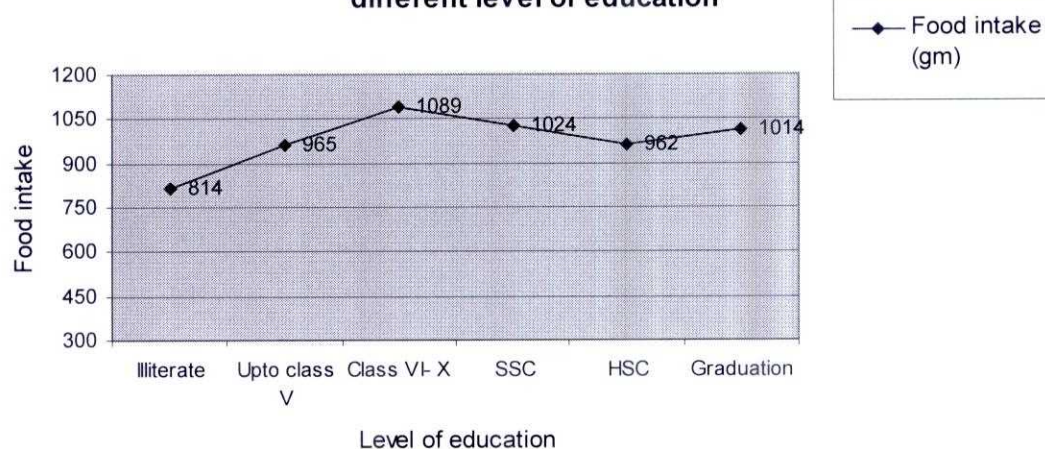
Figure shows the relationship between level of education and the size of the population. From the figure it is found that illiterate people have the maximum number of family members on average of 5.64 per family. On the other hand, families headed by graduates have the least average number of family members of 3.4 per family. Except for the group of HSC level education, number of family members is adversely correlated with level of education. Monthly income is also correlated with the level of education. Families with higher education earn more. Respondent's monthly average income by different level of education is shown in figure 17. Figure shows that those who are illiterate earn 3000 taka per month and the families headed by the graduates earn more than 10000 taka on average. With the level of education food intake is also correlated from illiterate to the level of class X. After completing matriculation it varies in different levels. Average per capita per day food intake (gm) by the respondent of different level of educational background is shown in figure 18.

Figure 17: Average monthly income by different level of education



Source: Self Compiled

Figure 18: Average per capita per day food intake (gm) by different level of education



Source: Self Compiled

Figure shows that families headed by illiterate people, food intake are less than the required for a balanced diet as well as less than the national rural average. Again as the level of education helps to utilize food properly with the better understanding on health and sanitation, it also ensures utilization of food by the educated families.

Consumption pattern of food

Consumption of food is the real indicator of food security of different socio-economic groups. Attaining the indicators of availability and accessibility does not necessarily mean that the consumption of food at national and individual level will be at the required level. There are different dimensions of consumption of food by different group of people. The normal diet of Bangladeshi people is seriously imbalanced, with inadequate consumption of fat, oil and protein and with more than 80 percent of calories come from cereals. Consumption pattern of food item is presented in Table 7.

Table- 7: Consumption Pattern of Food Items (grams), 1992-2005

Food Item	Balanced Requirement	Rural				Urban			
		91-92	95-96	2000	2005	91-92	95-96	2000	2005
Rice	390	481	479	479	460	416	391	378	379
Other Cereals	100	42	43	24	26	55	51	45	41
Potato & Vegetables	225	176	201	196	218	209	206	196	226
Spices		66	52	59	87	95	80	66	103
Pulses	30	17	13	15	13	22	19	19	19
Fish	45	32	42	38	40	48	52	41	50
Meat, Eggs	34	12	12	15	18	20	30	31	31
Milk & Milk Products	30	18	27	29	31	23	36	33	37
Oil & Fats	20	9	8	11	14	16	17	19	23
Sugar	10	9	9	6	8	11	10	9	10
Fruits	50	16	25	27	32	23	39	36	33
Total	934	878	911	917	947	938	931	871	952

Source: Self compiled based on HIES 1995-96, 2000 and 2005

Generally food habit plays a vital role in selecting food items. In addition to this, household's purchasing power, level of education etc. determines the pattern of food intake. With above characteristics intra household discrepancies also hamper the individual consumption of food, although on average they are taking required food as a household. Traditionally in Bangladesh women eat last and eat less. But they should take more food especially at the time of bearing child and when lactating. Due to greater nutritional requirements women and children are more vulnerable regarding consumption of food.

The table shows the picture of average intake of different food items in different survey years in comparison to normative food requirement prescribed by the National Nutrition Council for the average Bangladeshis for a balanced diet to live a healthy and active life. From the table it can be noted that the total intake of food items were below the required food intake for all the survey years in rural areas except for 2005. In urban areas the total intake shows a negative trend which was 938 grams per capita per day in 1991-92 and reduced to 871 grams per capita per day in 2000 and again increased to 952 grams per capita per day in 2005. But the intake of rice in rural areas was always much higher than the required level and in urban areas the intake was a little more or nearly equal to that of required amount.

The table also shows that there is a marginal deficit for potatoes and other vegetables. In rural areas the intake of potato and other vegetables has increased from 176 grams per capita per day to 218 grams per capita per day in 2005, which is near to equal of the required 225 grams. In urban areas the intake of potato and other vegetables have been increased from 209 grams per capita per day to 226 gram per capita per day in 2005. The table shows the substantial deficits for pulses, meat, eggs, oil and fats. In rural area the intake of pulses is nearly half of the required amount which in urban areas amount two third of the required amount. The amount of meat and eggs in rural areas shows a poor intake less than half of the required for all survey years from 1991-92 to 2005 which in urban areas from 1995 to 2005 was nearly equal to the required amount. In rural areas the intake of fats and oils are half of the required amount which in urban areas in 2005 accedes the minimum required amount.

With the above discussion table 8 is constructed on the basis of both primary data collected by the researcher and secondary data taken from the report of HIES 2005.

Table 8: Comparison of food intake between 2005 and 2009 at rural level

Food item	Balanced requirement	National rural food intake(2005)	Respondents food intake(2009)
Rice	390	460	421
Other cereals	100	26	15
Potato& other vegetables	225	218	290
Pulses	30	13	24
Fish	45	40	72
Meat & Eggs	34	18	21
Milk	30	31	51
Oils & Fats	20	14	18
Fruits	50	32	28
Others	10	95	8
Total	934	947	948

Source: HIES, 2005 and Self Compiled

Table 8 shows the balance requirement of food item, consumption of food in the rural area at national level in 2005 and consumption of food at rural level in the surveyed area. From the table it is found that the consumption of food by the surveyed family strongly corroborates with that of national level. In 2005, average food intake in rural area was 947 gm per capita per day which was 948 grams per capita per day in the surveyed area in 2009. Again it indicates the food is imbalanced due to high intake of carbohydrate. Although the intake of carbohydrate has been decreased to 421 gram per capita per day in 2009 from 460 gram per capita per day, but still it is high in comparison to balanced diet. The amount of fish and milk intake in the surveyed area which were 72 grams and 51 grams per capita per day, this is due to the cultivation pattern of the surveyed area. The surveyed area was fish and poultry dominant area. Commonly fish is frequently cultured in the surveyed area. It indicates that the amount of food intake is satisfactory in the surveyed area but due to weak utilization of food, people of the

surveyed area very often suffer from common diseases like diarrhea, fever, abdominal pain etc. From the table it can be noted that in rural areas food intake has increased over the time but in urban areas consumption of food has been decreased up to 2000 and again it has increased.

But in case of dietary composition it appears that the quality of food basket is better for urban areas compared to rural areas. The urban food contains comparatively less rice than rural food. At the same time the amount of meat, eggs, oil and fats are much better than that of rural areas. It also supports the observations made by Harun *et al.* in 2005. They pointed that the diet of Bangladeshi people is very much imbalanced leading to poor nutritional outcomes. High consumption of cereals but low intake of edible oils, vegetables and fish may result in low level of absorption of micronutrients and high level of anemia and other deficiencies. Thus taking of an imbalanced diet with less nutritional outcomes is affecting the poor people of Bangladesh leading to serious physical disorders. From the above discussion it is found that although in some cases availability of food is satisfactory but due to weak purchasing power and poor asset bases the access to food especially by the poor people is not ensured. Even availability and access to food is ensured somehow, lack of knowledge on health and sanitation is hampering the proper utilization of food. As a result the food security of the common people especially of the downtrodden population is in jeopardy.

Chapter - Four

Reasons for Food Insecurity

Prelude

Despite significant achievement in food grain production and food availability, food security at national, household and individual level remains a matter of major concern for the Government of Bangladesh. Sustainability of agricultural production system is already challenged by declining land and water resources, high input and energy costs, slow technology generation etc.(Shahabuddin *et al.*:2005:19). So, no single factor is responsible for food insecurity in Bangladesh. Number of factors affecting the food security has also been identified by the respondents of the surveyed area. The factors identified by the respondents of the surveyed area for food insecurity are as follows:

- Insufficient earnings,
- High prices of commodity,
- Huge population,
- Scarcity of land,
- Lack of employment opportunity,
- Low wages and
- Lack of government assistance.

These factors are nearly similar for all over the country with rare exceptions. Factors affecting food security are also interrelated. Negative impact of one factor affects the others negatively. With the above discussions factors responsible for food insecurity at different level can be mentioned as scarce land, huge population, natural calamities, climate change, loss of biodiversity, production of bio-fuels from plants, scarcity of irrigation water, lack of timely supply of agricultural inputs, poverty, income inequality, dietary habit, depreciation of money, and international price raise of food grain, slow technology generation, lack of sufficient investment in research and development in agricultural sectors.

Scarce Land

Paraphrasing Malthus, Heilbroner mentioned that 'Land, unlike people ... does not breed' (Heilbroner: 1953:82). The above quotation shows that land which is the key factors of production does not increase rather it decreases day by day due to rapid urbanization all over the world. The situation is more appropriate for Bangladesh.

Although land is one of the most important factors of production but in Bangladesh it is not well managed. After long 38 years of our independence we failed to prepare a land database. Lack of database and weak implementation of land use policy cultivable land is being decreasing day by day due to rapid urbanization, industrialization, construction of roads, bridges, dams, unplanned markets, shopping malls etc. At the same time new middle class non-agricultural families purchasing agricultural land for the purpose of future residential purposes. Due to scarcity of land some people purchase land for commercial purposes. Land purchased by these people remains unutilized as a fallow land. In addition, a number of developers are purchasing huge area of land for the purpose of business and in most of the cases fill up the marsh lands. All these lands are being lost from the list of agricultural productive land. Indiscriminate expansion of poursava, upazila and district head quarters is also responsible for the loss of agricultural land. Statistics shows that in Bangladesh everyday on an average 220 hectares of cultivable land is being converted into non-agricultural land. The rate of declining arable land is 1% per annum coupled with depleting soil fertility and micronutrients. Thus in the last 20-25 years 50 lac hectares of agricultural land has been converted into non-agricultural land (Samakal: 2009:5). If the rate of conversion of agricultural land to non-agricultural land continues in the year 2050 we will hardly get any land for agriculture and fishery. Conversion of agricultural land, forest land and aquatic land is not only reducing the scope of crop and other agricultural production but also destroying the ecological balance of crop production. Thus use of scarce land has become one of the vital factors for ensuring food security in a country like Bangladesh.

Huge Population

Population, another factor involved with the issue of food security especially for a small country like Bangladesh. Renowned population scientists Rather Thomas Malthus in 1798 in his writings 'An Essay on the Principle of Population' mentioned that the productive capacity of humans must put continual pressure on the 'means of subsistence'. Human numbers, he said, could increase by 'geometric' progression and the production of food Malthus did not see faster than 'arithmetic' progression. Unlike people, land does not breed, and Malthus thought that the potential for human numbers to increase

exponentially must therefore put continuous pressure on our food. Although it has been written more than 200 years back but it is still very much relevant to the context of Bangladesh. Question comes that how many people we can feed? Although we have been able to double our food production as mentioned earlier still we are running behind our targeted food production. Of course, question comes is it not food verses population?

To discuss about the question we can take the examples of Leather and Foster. He firstly argued that of course growth of population has direct impact on food production. As mentioned by Leather and Foster that if the population grows by 50 percent, and population characteristics cause a food demand to grow by 5 percent per capita, total demand grows by more than 50 percent- the demand will be 57 percent as calculated by the author. If the population grows by 50 percent, and if changes in population characteristics give food demand 5 percent boost, and if income increases demand per capita by 15 percent, total demand grows by 81percent. If diversification of diets has an additional impact on effective demand of 10 percent, the total growth in demand is 99 percent (Leather and Foster: 2005:183). From above examples it is clear that without controlling population addressing the issue of food security is totally impossible especially for a country like Bangladesh of 144570 square kilometers with 140 million people. In 1971 the population was 70 million and the cultivable land was 99 lac hectares but at present the population has come up to 150 million and the cultivable land plummeted to 66 lac hectares. As per statistics in the last 38 years the population has become double but the amount of cultivable land has been reduced from 0.87 hectares to 0.56 hectares. With the decrease of cultivable land, the population is increasing at the rate of 1.7 percent per year. This additional population requires additional food to meet their minimum dietary need. More importantly growth of population among the down trodden population is the key factor to be taken into consideration with utmost sincerity for ensuring food security.

With the above discussion if we calculate the amount of food needed for the total population by 2050, what will happen? Let us have a simple calculation, how much food will be needed by 2050? As per statistics, if population grows at the current rate by the end of 2050 total population will be 217.54 million (BBS: 2007a:140). Against this population land is constant rather decreasing. Taking the current rate of consumption of

food we get, in 2050 the amount of food will be needed 49.82 million metric tons. At present we can produce around 30 million metric tons of rice with the cropping intensity 1.81. So, for the added population to meet the demand of food in 2050 cropping intensity will have to be increased up to 3.02 as calculated by the researcher remaining other things constant. Remaining all other things constant, it is nearly impossible to increase the cropping intensity to 3.02, because soil health is already in jeopardy due to unscrupulous use of chemical fertilizers and pesticides land is losing its fertility, so only way to remain population under control. Considering the present birth and death rate for ensuring food security for all the growth of population should not be allowed more than 1 percent, even all other aspects of food security is improving at the current rate. If it is not and if it is allowed to grow more than 1 percent or at current rate, in near future some pharmaceuticals might have to come up with the chemically produced capsule to feed the extra people of the country. So, control of population is the first and most important task for ensuring food security for all.

Natural Calamities

Bangladesh is located in a disaster prone area. Recurrent floods, draughts, cyclones make the food security situation more vulnerable. According to the prediction of IPCC, among the most vulnerable countries to floods and cyclones, Bangladesh is the most vulnerable country to tropical cyclones and the sixth vulnerable country to flood. Recurrent floods and cyclones in the recent years corroborates with the prediction made by IPCC. The November 15 cyclone named as *Sidre* has destroyed acres of rice paddy, ruined the shrimp farms of the southern coast, and, according to the World Food Program, left 2.3 million people in need of urgent food aid (The New York Times: 2007). The government estimates that 6 million people were affected by the storm. Natural calamities are simply making the situation more worsening and unmanageable for the country to feed its people with very limited resources. Natural calamities are destroying the asset base of the people. For example in most of the cases cyclones and floods are washing the crops of the field causing huge loss of production. River erosion and huge land slide making the people landless. Due to the victim of natural calamities some people are becoming environmental refugees, some are becoming unemployed for a long period of time, some

are losing their agricultural land and some are losing their planted crops before harvesting facing double loss. Thus they are remained unfed or underfed for a certain period of time.

Climate Change

Climate change is a great concern for all over the world. Along with many other dimensions it is also adversely affecting the issue of food security. Changes in climate not only increase the temperature of the world it also increases the intensity and frequency of drought, floods and cyclones. In recent days it has also attracted the attention of the world leaders especially of the leaders of the Least Developed Countries (LDC). In 2007, 50 LDCs have prepared a National Adaptation Programs of Actions (NAPAs) which have been supported by the United Nations (UN). In Bali Conference they have argued for the Adaptation Fund which may in time support for dealing with climate change variability. This program has incorporated within the limited capacity of the poor farmers to adapt, plan for the use of alternative seed varieties, improved soil management, maintenance of water management systems and reforestation. So it has already been recognized by the international community that climate change has direct impact on production of food.

According to Intergovernmental Panel on Climate Change (IPCC) prediction, global temperatures will rise between 1.8 degrees and 4 degrees (Celsius) by the last decade of the 21st century. Bangladesh will be one of most victims of this temperature change. According to Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2008 due to increase of monsoon rainfall intensity of flood will increase. Global warming will result in mean sea level rises between 0.18 and 0.79 meters, which could increase coastal flooding and saline intrusion into aquifers and rivers across a wide belt in the south of the country. According to IPCC by 2050, changing rainfall patterns with increasing temperatures, flooding, droughts and salinity (in coastal belt) could cause a decline in rice production in Bangladesh by 8 percent and wheat by 32 percent, against 1990 as the base year. The recent estimates using different models with changed assumptions predicts for 2050 reduction in production by 1.5-25.8 percent for *aus* rice, and 0.4-5.3 percent for *aman* due to the effect of high temperature. For *boro* rice, production could be increased by 1.2-9.5 percent, assuming the temperature would not

exceed the 35° C threshold limit for rice production (Daily Star: 2009). Thus climate change has a direct impact on the production of food grain. Any loss in production of food grain will intensify the problem of food insecurity.

Climate change will impact the agriculture of Bangladesh by extending flood specially intensifying flash flood, increasing temperature leading to droughts, causing water scarcity for irrigation and domestic uses in north-west Bangladesh, increasing inundation and salinity intrusion, limiting crop cultivation with the existing varieties, especially in the coastal regions, increasing loss of land to river erosion, reducing land-based livelihood opportunities, and increased drainage congestion and water logging due to sedimentation of rivers, limiting production options for the char dwellers.

Loss of Bio-diversity

Loss of biodiversity is adversely affecting the production of food grains. Without preserving bio-diversity, we cannot expect sufficient and diversified production of food grain and other elements of subsistence. Citing Myers Professor Islam stated in his paper that the people have utilized about 7000 kinds of plants for food, predominant among these are wheat, rice, maize and a dozen other highly domesticated species. Yet there are at least 75000 edible plants in existence and many of these are superior to the crop plants in widest use. Among the insects large number of species that are potentially superior as crop pollinators, control agents for weeds, and parasites and predators of insect pests. Bacteria, Yeasts and other microorganisms are likely to continue yielding new medicines, food and procedures of soil restoration.

In Synopsis and Classification of living organisms about 1.4 million living species of all kinds of organisms have been described (Parker: 1982:17). Among these approximately 75000 are insects; 41000 are vertebrates, and 250000 are vascular plants and bryophytes. The remainder consists of a complex array of invertebrates, fungi, algae and microorganisms. Of the plants, 173 plant species have been recognized as domesticated species. Despite the large number of domesticated plants, 90 percent of national per capita supplies of food come from only 103 species (Prescott-Allen: 1990). According to FAO, 75 percent of biodiversity was lost in the 20th century. This is probably due to over exploitation reducing the size of population. Loss of habitat,

unscrupulous use of fertilizers, and overuse of pesticides are the key reasons for loss of biodiversity. The loss of biodiversity has direct impact on food production. As different plant and animal species form the ecosystem and the interaction among plants and animals along with non-living organism creates a balanced environment for the production of food and medicines, so any loss in the biodiversity will make loss in the pollination, loss of variety in different food grain and it will damage the soil characteristics. With the loss of bio-diversity the ecological balance will be hampered which will ultimately seriously effect the production of food adversely contributing to the food of the world, where Bangladesh is not an exception.

Lack of timely agricultural inputs

Supply of agricultural inputs is the key factor for agricultural production. Irrigation water, quality seeds, fertilizers, pesticides etc. are the key agricultural inputs. Among these, the supply of quality seed is the first precondition. Since the inception of the country up to 1980s Bangladesh Agricultural Development Corporation (BADC) was entrusted with the procurement and distribution of agricultural inputs. But with the pace of time it has been proved that BADC has been failed to supply these agricultural inputs smoothly. In 1980s the control of government in case of procurement and distribution of agricultural inputs starts to reduce. Private sector participation in case of irrigation sector starts in the late 1970s. In case of fertilizer distribution appointment of private dealers starts in 1987. They are allowed to procure fertilizer. Small amount of subsidies are also provided to ensure agricultural inputs to the farmers so that they can get incentive to produce more food grain. But all efforts come into failure when we see farmers block the road for the demand of fertilizer at peak season of their plantation. Very frequently we see farmer's takes part in *gherao* program of Upazila Nirbahi Officers office or Office of the Deputy Commissioner for the demand of fertilizer and seeds. This type of news in the news paper indicates that when plantation is hampered they come outside of the field. Without ensuring timely and quality agricultural inputs we cannot expect optimum production. Without optimum production we can not provide sufficient food at the time of need. So lack of timely supply of agricultural inputs such as quality seeds, fertilizers, electricity and diesel etc. are leading to food insecurity hampering domestic food production.

Poverty and Unemployment

The basic causes of endemic food security of millions of people are the limited access to productive employment opportunities. Due to unemployment or underemployment they lose their purchasing power. Although no definitive figure is available in the country on an annual basis as the number varies from time to time, but it is believed that one third of the total labor available in the country remain unemployed on an annual basis. It makes the poor poorer. Statistic shows that 19.5% people are hard core and 40.4% people are living under poverty line (BBS: 2007:71). Thus incidence of poverty and huge unemployment is an important denominator to the food security in the country.

Income Inequality

Income inequality is one of the important reasons for food insecurity in Bangladesh. In Bangladesh top 5% household earns 33471 taka per month per household where as bottom 5% household earns 1605 taka per month per household. Nationally people spending 53.8 percent of their income for food expenditure and 46.2 percent for non-food expenditure. Top 5 percent spend 33.2 percent of their income for food expenditure and 66.8 percent for non-food expenditure. Bottom 5 percent spend 67.9 percent for food expenditure and 32.1 percent for non-food expenditure (BBS: 2007:41). This type of income inequality leads to two types of malnutrition. In higher income groups one variant of malnutrition- 'over nutrition' which is the main problem of food security. Because one group taking more food but remaining unhealthy which is against the notion of food security. Against this high income group people with low income group are taking less food which leads them to malnutrition. Thus malnourished people are negatively contributing to the development of the country especially they remain unemployed due to health related issues. As a result they become poorer again. So the income inequality is contributing negatively in two ways in case of ensuring food security.

Depreciation of money

Depreciation of money has an impact on national import of food grain. As money value has been depreciated our national import of food grain cost has increased resulting less amount of food import which creates scarcity of food. For example in late 2002 one

Indian rupee cost 1.20 taka which has depreciated to 1.50 taka by early 2005. In 2007, taka started depreciating again, to be near 1.75 taka per rupee by early 2008 (Daily Star: 2008). Due to depreciation of taka import from India including food imports has become more expensive. As a result the price of food grain has increased and it has affected the purchasing power of the poor and finally created transitory food insecurity.

Hoarding and Syndicates

Hoarding of food grain illegally by some businessman has also increased the price again and it has also disrupted the distribution of food grain. Marketing and distributing bottlenecks lead to access problem, particularly on the poorer segments of the society. In addition to this unscrupulous demolition of bazaars in the early months of the caretaker regime, have made many people unemployed and it has damaged the food security of the poor. Hoarding of food grain by different syndicates not only increases the price of food grain but also makes the market unstable. The instability of the prices of food grain makes the market unpredictable leading to the lack of purchasing power particularly of the poor people. Thus the poor people become more food insecure.

Dietary Habit

Dietary habit is another reason for food insecurity in Bangladesh. Dietary imbalance and unavailability of micronutrients are also among the major factors responsible for poor nutritional outcomes. High consumption of cereals, but low intake of edible oil, vegetables and fish result in a low level of absorption of micronutrients and a high level of anemia and other deficiencies. Chantell Witten, country director of Helen Keller International informed the roundtable that 'only four percent of the population here can afford optimum level of food and it means that 96 percent people cannot take food with adequate calorie intake' (Daily Star: 2006:10). Due to intake of huge cereals we are simply ignoring the cultivation of other food items like pulses, oil seeds etc. which is also responsible for intensifying the situation of food insecurity. Due to faulty dietary habit for a long period of time we mainly opt for cereals but we should opt for vegetables, protein and fats as an alternative of additional carbohydrate for a balanced diet.

Insufficient Social Safety Net Program

Social safety net programs are the preconditions for ensuring food security of the poorest of the poor. As natural calamities very frequently hits the people of the country, so social safety net program has a vital role in ensuring food security. In addition income poverty is dominant particularly in the northern part of the country leading a group of people unfed or underfed for a particular season termed as *monga*. So, sufficient social safety net programs are very essential to fight against food insecurity. At present there are approximately 27 social safety net programs in the country (Planning Commission) but the coverage is inadequate. Less than 1% of GDP is allocated to various SSNP's, far less than the average allocation of 5% of GDP in South Asia (World Bank: 2004). Approximately 10% of the poor and 5% of the ultra poor is covered by any SSNP. 50% of eligible old age people are not covered by any pension scheme. Mismanagement in the distribution processes of social safety net program also jeopardizes the food security of the poor and ultra poor.

Lack of Health Education

For ensuring food security of the people both the quantity and quality of food are important. For quality, appropriate standards should be maintained in storing, processing, preparation and contents of meal. Very often the available and accessed foods are not properly utilized due to loss of volume, quality, and nutritional values from improper storage, processing and cooking practices. Loss of quantity and quality of grains under government storage is a very common phenomenon. Processing also greatly affects physical and chemical properties of food. Utilization of food is also affected by cooking practices. Careless and excessive washing of food items before cooking often causes huge loss of food values. Sometimes too much of heating impairs color, flavor and nutritional value of food. The above situation happen due to lack of health and sanitation education. Ordinary people very often lack awareness and basic knowledge regarding these aspects. Although there are campaigns in the country to improve sanitation and health related awareness but it is still far behind of the required level. So, lack of health and sanitation education, our people is being deprived of taking balanced diet.

Conclusion

From the above discussion it is clear that the issue of food security or insecurity is related with a number of factors. Some are related with the availability of food like increasing production of food items, some are related with the accessibility of food like raising the wages of the poor or lowering the prices of the food items to increase the purchasing power of the poor, some are related with utilization aspects of food security like lack of health and sanitation education. Increasing productivity of food items again depends on some other interrelated factors such as supplying timely and quality agricultural inputs to the farmers, ensuring profitable price of produced food items, creating sufficient and smooth marketing facilities for the produced good and finally ensuring effective governance for ensuring all the aspects of food security as a whole. But it does not depend on the implementation of any of the single factors rather it requires coordinated efforts which are very much related to the policy decisions. Without proper policy we can not implement any of the programs, so role of policy makers and implementers are also important for ensuring food security especially for a small but overpopulated food deficit country like Bangladesh.

Chapter – Five
Public Policies towards Food Insecurity

Prelude

Over decades the Government of Bangladesh has striven to attain self-sufficiency by increasing the production of rice but a little is possible in increasing production of food grain due to little scope for extensive farming (Hossain *et al.*:2005:122). Most of the increased production is related to the application of modernized technology as well as improved agricultural inputs. All these things are very much related to the macro policy interventions that include the agriculture policy, land use policy, import substitution or export orientation in other words trade policy. In addition, in a country like Bangladesh with huge population nothing will work until or unless the increase of population will be controlled. So the increase of production is not sufficient to address food security especially for the poor and malnourished people who are the real food insecure. From the above discussion broadly we can discuss the areas of population control, increasing agricultural production through technological improvement, providing subsidies to agricultural inputs, stabilizing prices of food grain, managing the stock of food grain properly, liberalizing the trade, managing the environment, managing risk through disaster management and addressing health related causes for under nutrition as policy measures.

Policies to Population Control

It was a long debate over a period that is it not food versus population? As mentioned by Thomas Malthus reproductive capacity of humans always put continual pressure on the 'means of subsistence'. Rapid growth in population creates extra burden to fight against food insecurity. For Bangladesh it is the reality to ensure food security without effective population control. As a first step of ensuring food security family should be planned with the implementation of pragmatic population policy. Although Bangladesh has achieved a remarkable success in reducing population growth in 1990s but in recent year's statistics shows an upward trend of increasing population. Population Census estimates that population growth rate was 2.17 percent in 1991 which has been reduced to 1.40 in 2001. But again it starts rising since 2002. In 2002 it increases at the rate of 1.53 and it continues at the rate of 1.50 since 2004 and onward (BBS: 2007a:127). If the present trend of population growth is allowed to continue unabatedly then in the year

2037 the size of the population will shoot up to 210 million (Daily Star: 2008). If the population increases by 50 percent total food demand increases by 99 percent (Leathers and Foster: 2005:184). In Bangladesh with an area of 147570 sq km it will simply become impossible to ensure minimum dietary requirement. To reduce the population successful programs have been implemented in the recent past by the government and non-government organizations. Those programs should be continued and if necessary strengthen to bring out further reduction in the population growth rate as fast as possible.

For this The Chinese Glory Certificate System of population control can be accepted and strictly implemented. For the control of population Chinese has adopted a system of one child policy with some incentives. In China those who contract to limit their families to one child receive 'Glory Certificates'. Such couples are widely publicized and help up as models for their countrymen, as the rewards they earn. In Bangladesh to control population the following incentives can be provided:

- Couple with one child may get free and priority medical care for the child, priority admission to kindergartens and other government schools,
- Priority should be given in case of allotment of government lands, government accommodation facilities in case of allotting residence for the officials of government, semi-government and autonomous organizations,
- In case of providing government and bank loans and other facilities the parents with single children should get the priority, and
- All these measures should be incorporated as a policy option in the population policy not only for ensuring for the effective control of population in view of ensuring food security of the people but also for the effective development of the country.

Macro policy interventions

The success of any policy is conditioned by macroeconomic developments. Without developing macroeconomic indicators we can not expect progress in resolving any problem. As a policy measure macroeconomic intervention includes to increase the growth of GDP, overall development through industrialization, trade liberalization with the pace of globalization, maintaining low level of inflation. Macroeconomic policies in

the countries in this region were pursued in the context of progressive liberalization, rather than de-bureaucratization, careful sequencing of reforms starting from the industrial and financial sector reforms and concern for stable price level. Bangladesh has also followed some of the indicators like the growth of GDP in Bangladesh for couple of years was running around 5 which are satisfactory in the context of macroeconomic parameters. Bangladesh has been able to maintain low level of inflation. Development in some of the industrial sectors like RMG, pharmaceuticals and ship building is satisfactory. All these indicate the macroeconomic development of a country. As Bangladesh has been able to manage the recent world recession efficiently so our macro economic policy should continue for the macroeconomic development. With the improvement in macroeconomic indicators we will be able to invest more which will create more job facilities for the poor. With increased job facilities poverty will be reduced. With the reduction of poverty and more employment opportunity we will be able to ensure food security of the poor. So, our macroeconomic policy should be such so that the poor get the benefit of it.

Ensuring optimum use of land

Growth of food production depends on a number of factors like use of land, water, forest and other agricultural inputs like fertilizer, pesticides etc. Optimum utilization of land can be ensured with the implementation of land use policy properly which is also related with the implementation of agriculture policy. Bangladesh already faces formidable challenges of keeping up the present momentum of food production in a declining land and water resource situation. A proportion of cultivable land is also being shifted from crop cultivation to more profitable enterprises such as pond fishery, livestock farming and agro-forestry. Conversion of agricultural land to residential and commercial land to be retained at minimum level by ensuring proper planning for housing and commercial and industrial activities, other wise in near future no land will be remained as agricultural land if it is being reduced at current rate of 1 percent per year. But to protect rice lands from being converted into non-agricultural uses, policy should be adopted. Possibilities of earth filling along the sea, organized community housing and enactment of laws

restricting conversion of agricultural land for other purposes can be explored. With the proper use of land optimum production is to be ensured.

Managing lands of hills, haors, baors and other marsh lands as well as forest lands is to be taken into consideration. Without considering these lands we will not be able to reduce environmental degradation. Without managing environment we can not ensure the working ecosystem which is the precondition for growth in food production. It is also essential for managing bio-diversity which is another precondition for diversified production of food grains. But in Bangladesh small and marginal farmers, who constitute the overwhelming majority of farm households, have little access to those lands. Even personnel involved in farming, fishing has limited access to government owned land either in the form of permanent settlement or in the form of lease to live their livelihood by enhancing agricultural production.

Promote growth of food production

Agricultural growth depends on how the sector is organized and the level of access of the farming communities to growth augmenting inputs. Agricultural inputs include irrigation water, quality seeds, diesel, fertilizers, pesticides etc. Adoption of improved varieties and crop management technologies with necessary mechanization will help to ensure agricultural growth. To ensure best use of technology agricultural research is a must. With scanty resources and manpower, plant breeding research at BRRI has made commendable achievements in developing and releasing a number of climate adjusting varieties such as drought escaping *aman* varieties, BR-33 suitable for *Monga* areas, BR-42, 43 as draught resistant *aus* varieties, BR-40, 41 as salt tolerant *aman* varieties and BR-47 as salt tolerant *boro* varieties for the coastal areas, and BR-46, 22, 23 as post-flood late planting *aman* varieties for areas where flood water recedes late. BRRI in collaboration with IRRI and other international institutions has been also engaged in developing submergence-tolerance *aman* variety (BR-11, Sub-1), salt-tolerant varieties for *boro*, cold-tolerant variety, high tide and low tide variety for coastal belt, and early and late drought-resistant *aman* varieties.

Soil health is in jeopardy due to loss of organic matter content and continuous use of unbalanced chemical fertilizers for irrigated rice production. Fertilizer shortage is held

responsible for the looming food crisis. For ensuring optimum production ensuring agricultural inputs such as seeds, fertilizers, and pesticides are necessary. Subsidizing in agricultural inputs can help the farmers to use it properly. To ensure optimum use of TSP and MoP fertilizers for maintaining good harvests in the coming seasons, additional subsidies on non-urea fertilizers or at least recasting subsidies on urea should be attempted along with further improvement of fertilizer delivery mechanism. Uninterrupted power supply and sufficient water supply at the time of need is also very essential for ensuring optimal production.

Sustaining production in favorable ecologies and modernizing production system in unfavorable eco-systems call for massive technological support. Bangladesh has 41 percent of land as agro-ecologically constrained regions, which include deeply flooded areas, char land, flush flood areas, coastal tidal surge and salinity prone areas and hill areas. These areas have difficult soils, poor communication infrastructure; disperse agricultural extension network, poor marketing facilities and high incidence of poverty, and thus these areas need special investment priorities. Especially, attempts must be made to increase cropping intensity by bringing huge seasonal fallow lands available in the north east, southern and some parts of northern regions.

Improving access to food to the disadvantaged

Government policies have important role to play when it comes to the access to food or more broadly food security of the poor and disadvantaged. Access to food is related to the price of food grain, employment opportunities of the poor and the distressed, income of the people, and production of food grain by themselves, market facilities and the public food distribution system through different programs implemented by the government in the name of social safety net programs. Most of the measures taken by the government for ensuring access to people are related with the policy options.

Lowering food prices is one of the policy options implemented by the government for ensuring food security of the poorest people of the country. It is possible only when producer will get the subsidies for the agricultural inputs such as seed, fertilizers, and pesticides. Investments in basic rural transport and information systems can play a vital role in reducing prices and increase opportunities, particularly where farmers are in

remote areas. Improvements in customs facilitation, logistics performance and efficient grain storage can enhance producer responses as well as benefiting consumers. In addition, mechanization in agriculture with improved technology with sufficient marketing facilities will also help to lowering price of agricultural products.

Increasing purchasing power and sufficient social safety net programs can help to improve access to the poor and the disadvantaged. Creation of sufficient job facilities and by raising wages of labor can help to access to the poor. Other factors determining the price and access to food grain are the rapid changes in production environment, market conditions and public perception on the instability of food grain production. Proper implementation of public food distribution system is also to be ensured as a policy option. All the steps highlight the need for public intervention in food grain management and operation in Bangladesh.

Creating and managing buffer stock

Bangladesh implements many social safety net programs and other special programs for ensuring food security of the poor and low income groups. For the implementation of these programs like Open Market Sale, other rationing programs at subsidized rate for the personnel serving in different department's domestic procurement program retains its importance. For the successful completion of domestic procurement amount of food grain purchased, fixation of purchasing price, time of purchase, way of purchasing, developing infrastructure for buffer stock, and transportation of food grain at the time of emergency is important. For the export items rules and regulations for trade, tax and tariff rules are also important. All these need policy decisions. Not only creating buffer stock at sufficient amount, proper management of buffer stock is also equally important. Very often we can see that due to malpractices during procurement food grain with low quality having more moisture in the procured grains are collected by the officials in the process of procurement. Due to high moisture, it is not possible to manage the stock properly which leads to damage of food grains. This type of mismanagement should be stopped. For this stick and carrot policy can be adopted. For doing all these things mentioned above, policy option should be in such way so that it helps to create sufficient buffer stock and to manage buffer stock effectively.

Conclusion

For ensuring food for all as stated by the constitution of Bangladesh policy should be formulated in such way so that agricultural lands are well preserved for agricultural purposes, population are controlled so that we can feed our people, agricultural inputs are available to the farmers, stocks are managed effectively and efficiently, safety net programs are operated targeting the real poor. Investments in agriculture and research and development in agriculture are ensured properly. To do that agriculture policy, land use policy, population policy, trade policy as well as foreign policy should be revisited considering the issue of ensuring of optimum benefit for the poor and distressed people of the country.

Chapter –Six

Conclusion and Recommendation

Prelude

Despite commendable achievements in increasing domestic food grain production long term food and nutrition problem still persist in Bangladesh. Instability of prices of food items is a common phenomenon in Bangladesh. Bangladesh has yet to achieve comprehensive food security that resolves the problems of inadequate food intake in respect of amount and calorie. Ensuring quality of food is far behind due to lack of proper monitoring and weak implantation of rules and regulation related to maintaining quality of food. People of the same trade seldom meet together and create syndicates which ultimately lead to the price hike of essential commodities. Mismanagement in the implementation of public food distribution system is also very frequent in different part of the country.

Recommendations

As food security is a great concern for the next fifty years all over the world especially for the developing and food deficit country like Bangladesh. To increase food production as key factors of ensuring food security policy actions are needed. Bangladesh still a food deficit country due to shortage of domestic production in comparison to need. As per the objectives of National Food Policy, 2006 the achievement is not satisfactory. The people are still suffering from food in different regions as well in different groups. To achieve the objectives of the government policies increase of domestic food production, access to food by all people and proper utilization of food to is be ensured. A number of suggestions were made by the respondents are as follows:

- ✓ Ensuring sufficient fertilizers at subsidized rate to the farmers as per their requirement for increasing domestic production,
- ✓ Ensuring quality seeds as well as diesel and supply of electricity at the time of irrigation,
- ✓ Ensuring optimum price for their produced goods,
- ✓ Providing agricultural loan, fishery loan and bank loan for small business without collateral at a minimum rate of interest with 1 year moratorium period,

- ✓ Ensuring marketing facilities for a long time with the development of internal communication as well as establishing sufficient storage facilities for their produced goods and establishment of ice plants for fish processing.

With the suggestions made by the respondents and the discussions made earlier for ensuring food security as a whole following measures should be taken:

Controlling Population

Controlling population especially among the downtrodden people is one of the most important tasks for ensuring food security. Without addressing the issue of population control no mechanism will work for ensuring food security. For this families with single child should be given special facilities as a part of policy option in every sector like education, health, government and semi-government services so that people feel encourages to plan their family with single child. So, for the success in controlling population reviewing the health policy, developing a pragmatic population policy and the proper implementation of those policies is to be ensured.

Increasing domestic production

Increasing domestic production is an important way of ensuring food security all over the country. It can be done with the implementation of the following suggestions:

Ensuring proper use of land: To increase domestic production proper use of land, water and forest is to be ensured. Ensuring proper use of land can be done with the implementation of following steps:

- Creation of land database for the implementation of land use policy,
- Conversion of agricultural lands to residential, commercial and industrial purposes should be done in a planned way,
- Frequent loss of agricultural land should be stopped for the sake of food production, and
- Vertical expansion as well as zoning of land should be taken as a policy option for the maximum utilization of land. With the zoning system different zones for industrial, residential and other purposes will be established. In different zones a minimum required land will be allowed for housing and

other purposes. No one should be allowed to build residential houses even in the rural area. Indiscriminate use of land for housing should be stopped rather to start community living even in the rural area. Government should provide loans at either 0 percent or 1 percent interest rate for creating brick built multistoried building in the rural to encourage community living for the sake of converting agricultural land to residential purposes.

Ensuring agricultural inputs: Availability of agricultural inputs like supply of irrigation water, supply of diesel, quality seeds, supply of different types of fertilizers like Urea, Triple Super Phosphate (TSP), Muriate of Potash (MoP) etc. is to be ensured timely at a subsidized rate. In case of agricultural inputs quality should be ensured with the implementation of laws related to the sectors.

Adopting High Yielding Varieties: Adopting High Yielding Varieties (HYV) should be ensured in major cereal and non-cereal production system to ensure maximum production. With the adoption of HYV mixed cropping system can be incorporated in the farming system. It will help to increase agricultural production with the increase of cropping intensity.

Investment in agriculture for technology generation: Investment in agricultural research is a must to generate new technology. Technological improvement as a driving force can help in the following areas:

- Yielding potential and responsiveness to available chemical fertilizers and pesticides;
- Adaptation to the growing period and drought tolerance;
- Disease and pest resistance;
- Improvements in quality, palatability and consumer acceptance;
- Storage, transport and other handling qualities with available technology;
- Changes in labor requirements in production and processing in relation to the available mechanical technology and
- Compatibility with other social, cultural and economic norms.

Efficient use of water resources: Efficient use of water resources is to be ensured for the optimum production. The challenges of water scarcity are heightened by increasing

cost of developing new water resources, soil degradation in irrigated areas, groundwater depletion, water pollution, and ecosystem degradation. Especially, water productivity, which is much less than in neighboring countries, has to be increased through dissemination of water saving technologies, on-farm water management training and wherever possible promoting rain water harvest. So, policies for proper and efficient use of water should be formulated and implementation of policies is to be ensured.

Preserving Bio-diversity and cropping diversity

Preserving bio-diversity may result for an optimum production of different food grain. Especially, attempts must be made to preserve those varieties who are vulnerable to ensure sustainable food security. Preserving bio-diversity will help to meet the demand of dietary requirement. With the implementation of Integrated Pest Management (IPM) and environment friendly agricultural technology we can preserve our bio-diversity. Again as we have fertile land so diversification of agriculture would help to diversify our food basket with the improvement of fertility of agricultural land. In the process of preserving bio-diversity and maintaining cropping diversity emphasis should be given on the production of vegetables, pulses, fruits etc. other than rice and wheat. Fish, cattle, and poultry production should also be encouraged and facilitated for increased availability of sources of protein. Thus biodiversity play a vital role either directly or indirectly in the agricultural production. Without preserving biodiversity we cannot imagine good soil health as well agro forest management which is another component related to climate change and natural calamities.

Mitigation to Climate Change and natural calamities

Institutional capacity must be strengthened so that we can adapt with the vulnerability of climate change and natural calamities. This should be included in mainstreaming climate change adaptation in government policy discourse, mobilization of trained manpower, awareness building, and incorporation and upgrading of university curricula on disaster management and climate studies and research. There is also an urgent need of establishing ecosystem based studies and database so that the impact of climate change on crops, livestock, fishery, bio-diversity and natural resource management can be appropriately monitored.

With the above discussion following steps should be taken to coup up with natural calamities and negative impact of climate change:

- Cultivation of various types of crops with different varieties of rice and other main crops especially in the coastal belt of the country.
- Short-term cultivable as well as various types of cultivable crops specially with changing pattern and quality of water like saline resistant, drought resistant varieties should be introduced.

Effective stock management

Ensuring procurement is most important to create sufficient amount of buffer stock. The program of procurement should be implemented strictly without any biasness or favoritism. For this following steps should be taken:

- Price of procurement of food grain should be fixed in such a way so that the producer gets maximum benefits, allowing maximum scope for operation of private traders and preventing excessive destabilizing impact on either the budget or the financial market,
- Number of godowns and stocking capacity of godowns should be increased especially in the north-western part of the country so that sufficient food grain can be procured at the peak season to meet the demand of lean season specially for conducting relief and other subsidized state operated programs,
- Procurement process should be free from corruption and any sorts of political interruptions. Any lapses by the personals involved in the process of procurement should be taken seriously,
- Effective management & maintenance of food stock should be ensured, and
- Lastly, small farmers should be provided with loans at a low interest rate with six months moratorium period so that they can produce for the next seasons as well as they are not compelled to sell their product immediate after harvesting at low prices to return the loans of *mahazan* rather to store food at they required for their personal consumption.

Lowering and stabilizing price of food grain

Management of food grain and its operation depends on demand and supply of food grains. To stabilize the food price efficient cereal stock policy, effective trade and tariff policy, development of non-cereal food market with appropriate market intervention strategy to protect producer and consumer's interests can play a vital role. Lowering food prices through price control directly or reduction of import tariff may be another effective mechanism. Taxes or subsidies on the other hand can be another effective tool for stabilizing food markets. To do that market should be free from syndicates and illegal hoarding.

Liberalizing trade

As Bangladesh is a densely populated country, it will be likely to remain a net importer of food grains if the population growth is not being controlled and domestic food production is not increased sufficiently. So, the liberalization policy in food will bring benefit for us. Ensuring functional global market in food products should be a priority in our foreign policy. In this case Bangladesh should explore an Asian agreement on rice trade. With this import additional food aid will also play a vital role in ensuring food security. As at recent time the amount of food aid is decreasing our foreign policy should address the issue of food aid with due attention.

Raising budgetary allocation

Raising budgetary allocation for agriculture is essential at least to the level of its contribution to the ADP. Present government has declared a large budget with huge ADP but only 1 percent of the budget has been implemented in the first quarter which is not at all satisfactory in the scale of implementation. With sufficient budget it will be possible to conduct more agricultural research which will help to introduce HYV and high technology and to plant, harvest them in an improved manner.

Creating employment opportunities

Employment creation for the poor and the disadvantaged is essentially needs to be accepted as a direct policy goal. For this both micro and macro policies should be geared to that end. For creating employment opportunities following steps can be taken:

- The capability of the people should be improved through education, training and healthcare facilities;
- Raising wages of labors employed in agriculture and industries including ready made garments;
- Promoting rural and agro-based industries and enterprises. It should permeate all sectors including crop, livestock, fishery, forestry, industry, construction and services;
- Undertaking productivity enhancing programs for rural and agro-based enterprises;
- Investing in productivity enhancing appropriate technology with linkages as a means of employment generation;
- Public investment in transport and communication.

Enhancing Social Safety Net

Identifying the vulnerable groups within households and design programs to address their problem of access to food is an important task. It can be done by supporting safety net programs to protect the rural poor and the distressed by different natural calamities. Food based interventions such as food for work, cash for work, food for education, vulnerable group development, and vulnerable group feeding etc. can reduce the vulnerability of the poor and thus can ensure access to food. In case of social safety net programs following steps can be taken:

- Support to women in income generating activities;
- Broad-based economic growth;
- Initiate special program for disaster mitigation for agriculture;
- Undertake emergency distribution from public stock;
- Encourage private sector initiatives to augment domestic food supplies;
- Undertake extensive public education and marketable skill development program;
- Initiate more gender responsive programs to promote women development.

Providing sanitation and health education

Food security does not necessarily mean ensuring the quantity of food only, it also accounts for the quality of food. For ensuring quality of food proper knowledge on sanitation and health education including safe drinking water, improved sewage disposal, immunization, and public health services should be ensured. For quality, appropriate standards should be maintained in storing, processing, preparation, and contents of meals. For improving knowledge on sanitation and basic health, campaigns may be launched by different type of institutions like local government bodies, schools, Non Government Organizations, mosques and other places of prayer, local clubs, libraries, and mothers clubs. For these following steps to be taken:

- Reduce prevalence of water and food borne diseases;
- Improvement in water quality reduction in arsenic level in drinking water;
- Infrastructure development by public investment in water supply and sanitation facilities;
- Investment in safe storage, safe market places & safe handling facilities;
- Harmonization of standards of food products by developing and enforcing grades, standards and quality;
- Developing and enforcing proper labeling and packaging rules/standards;
- Creating food safety database and food safety research;
- Establish effective food borne disease surveillance system;
- Initiating awareness build-up programs and co-coordinating mechanism to control indiscriminate use of harmful additives, preservatives, emulsifiers or toxic elements in food production, processing and marketing chain.

Promoting PPP

Promoting Public Private Partnership (PPP) among the government, private sector and NGO can play an effective role for ensuring food security. For this, different aspects of food security including job creation, monitoring prices of commodities, stabilizing market as well as ensuring smooth distribution of food grain at the time of need. Under the PPP following tasks can be done:

- Establishment of new godowns and cold storage especially in the *monga* prone northern part of the country so that food can be easily stored after a bumper crop;
- Small agro-based industries can be set up in the rural areas for processing and preserving their perishable goods like fruits, vegetables, fishes etc. for further marketing and to ensure maximum utilization;
- Rural communication can be developed under PPP which will help to easy marketing of the rural products by the producer themselves without the interference of middlemen to get the maximum benefit of their product;
- Research and investment can be done for improving agriculture technology, introducing the technology and generating HYV.

Strengthening Coordination and Monitoring

Strengthening coordination among different institutions and organizations for developing market facilities, developing infrastructure, transport network and Information Technology is essential for optimizing production, distribution and marketing and stabilizing prices of food grain. Formation of different appropriate committee at different level and holding regular meeting for effective coordination can help to monitor and evaluate the market mechanism which will help to make price support to the farmers. It can be done by initiating major sectoral review of agriculture including marketing and extension and connecting all market place with modern IT communication

Ensuring effective governance

For ensuring food safety and quality control many rules, regulations and laws have been promulgated by the Government. For example, Pure Food (Amendment) Act, 2005, The

Bangladesh Standard and Testing Institute (Amendment) Act, 2003 etc. Very recently Mobile Court Ordinance, 2009 has been promulgated for the control of law and order as well to prevent adulteration of food. Proper application and implementation of these rules and regulations are very much essential for ensuring quality of food. Along with the implementation of rules and regulations local government can play a vital role in implementing different policies, programs related to food security. Governance free from corruption, and bureaucratic procrastination and hindrances can ensure participation, transparency and efficiency which are the precondition for implementation of any policy or programs efficiently and effectively. So, ensuring effective governance can help to ensure quality of food which is one of the key components of food security.

Finally, it can be concluded that despite progress in some development indicators existing pervasive poverty all over the country leading to a large group of people unfed or underfed. So, investment and reforms on multiple factors including human resources development, agricultural research, building rural infrastructure, water resources management, and farm and community based agricultural and natural resources management to be ensured. Along with the above recommendations an efficient public food distribution system can play a vital role in government's food policy and make a significant contribution to the food security of households who receive transfers. Taking these into consideration, Bangladesh should concentrate on agricultural development, especially, self-sufficiency in food grain production, mitigating and adapting to climate change and of course, pro-poor growth with effective population control under the implementation of a proper population policy. Other programs like tree plantation, coastal forestation, agro-forestry, water conservation and dissemination with the huge potential of Agriculture Extension Department should be properly utilized. Solving these problems will require decisive action by the government, the private and individual households. Finally both public and private investments, more specifically through targeted public investment to encourage and facilitate private investment, especially by farmers themselves will help to produce more food for achieving food self sufficiency. Implementing all these efforts will help in sustainable food production as well as in ensuring food security and nutrition, and better livelihood.

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Annexure 1: Questionnaire on Food Security in Bangladesh: Role of Public Policy

বাংলাদেশের খাদ্য নিরাপত্তা : সরকারী নীতিমালার ভূমিকা শীর্ষক সমীক্ষা

প্রিয় উত্তরদাতা,

এ প্রশ্নমালার ভিত্তিতে প্রাপ্ত উত্তরসমূহ একটি গবেষণার কাজে ব্যবহার করা হবে। এ গবেষণার উদ্দেশ্য হচ্ছে বাংলাদেশের খাদ্য নিরাপত্তার বাস্তব অবস্থা যাচাই করা এবং জনসাধারণের খাদ্য নিরাপত্তা নিশ্চিত করতে সরকারী নীতিমালার ভূমিকা পর্যালোচনা করা। আপনার আন্তরিক সহযোগিতা এ গবেষণাটি সম্পন্ন করতে সহায়তা করবে। আপনার দেওয়া উত্তরসমূহ শুধুই গবেষণার কাজে ব্যবহার করা হবে এবং আপনার সহযোগিতার জন্য আন্তরিক ধন্যবাদ।

উত্তর দাতার পরিচিতি:

১। নামঃ

২। লিঙ্গঃ ☐ পুরুষ ☐ মহিলা

৩। ঠিকানাঃ

গ্রামঃ ইউনিয়নঃ

উপজেলাঃ জেলাঃ

৪। বৈবাহিক অবস্থাঃ

☐ বিবাহিত ☐ অবিবাহিত ☐ বিধবা/ বিপত্তিক ☐ স্বামী পরিত্যক্তা

৫। বয়সঃ

☐ ১৮-২৫ বৎসর ☐ ২৫-৩০ বৎসর ☐ ৩০-৩৫ বৎসর
☐ ৩৫-৪০ বৎসর ☐ ৪০-৪৫ বৎসর ☐ ৪৫-৫০ বৎসর
☐ ৫০-৫৫ বৎসর ☐ ৫৫-৬০ বৎসর ☐ ৬০ বৎসরের উর্দে

৬। পরিবারের সদস্য সংখ্যাঃ

☐ শিশু ☐ অপ্রাপ্ত বয়স্ক ☐ প্রাপ্ত বয়স্ক ☐ বৃদ্ধ

৭। পেশাঃ

☐ কৃষি কাজ ☐ ব্যবসা ☐ চাকুরি
☐ দিনমজুর ☐ অন্যান্য ☐ ভ্যানচালক

৮। শিক্ষাগত যোগ্যতাঃ

☐ নিরক্ষর ☐ পঞ্চম শ্রেণী পাশ ☐ দশম শ্রেণী পর্যন্ত
☐ এস. এস. সি ☐ এইচ. এস. সি ☐ স্নাতক/ স্নাতকোত্তর

খাদ্য নিরাপত্তা সম্পর্কিত তথ্যঃ

৯। আপনার পরিবারের জমির পরিমাণ (প্রযোজ্য ঘরে টিক চিহ্ন দিন)

ভূমিহীন		২.৫০-৫.০ একর	
০.০৫-০.৪৯ একর		৫.০- ৭.৫০ একর	
০.৫০-১.৪৯ একর		৭.৫০- একর এর উর্ধ্বে	
১.৫০-২.৪৯ একর			

১০। আপনার নিজের জমি থেকে উৎপাদিত শস্যে বাৎসরিক খাবারের চাহিদা মিটে কিনা?

☐ হ্যাঁ

☐ না

১১। না মিটলে কতদিনের ঘাটতি থাকে?

☐ ১-২ মাস

☐ ৩-৪ মাস

☐ ৫-৬ মাস

☐ ৭-৮ মাস

☐ ৯-১০ মাস

☐ সারা বছর

১২। ঘাটতি থাকলে কিভাবে মিটানো হয়?

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খ.

গ.

ঘ.

১৩। আপনার পরিবারের মাসিক আয় কত?

মাসিক আয়	☒ চিহ্ন দিন	মাসিক আয়	☒ চিহ্ন দিন
১০০০ এর নিচে		৫০০১-৭০০০	
১০০১-২০০০		৭০০১-১০০০০	
২০০১-৩০০০		১০০০০ এর উর্ধ্বে	
৩০০১-৫০০০			

১৪। আপনার পরিবারের মাসিক ব্যয় কত?

মাসিক ব্যয় (টাকা)	☒ চিহ্ন দিন	মাসিক ব্যয় (টাকা)	☒ চিহ্ন দিন
১০০০ এর নিচে		৫০০১-৭০০০	
১০০১-২০০০		৭০০১-১০০০০	
২০০১-৩০০০		১০০০০ এর উর্ধ্বে	
৩০০১-৫০০০			

১৫। আপনি দিনে কয়বেলা খাবার গ্রহণ করেন?

☐ একবেলা

☐ দুইবেলা

☐ তিনবেলা

১৬। আপনার সাপ্তাহিক খাদ্য তালিকায় নিম্নের উপাদানগুলো কি পরিমাণে থাকে?

খাদ্যের উপাদান	পরিমাণ (গ্রাম)	মন্তব্য
ভাত		
আটা		
মাছ		
মাংস		
ডিম		
দুধ		
ডাল		
আলু		
শাক		
সবজি		
তৈল ও চর্বি		
ফলমূল		
অন্যান্য		

১৭। আপনি কি মনে করেন সুস্থ সবল জীবন ধারণের জন্য পর্যাপ্ত খাবার খাচ্ছেন?

- ☐ হ্যাঁ ☐ না
☐ মোটামুটি ☐ মন্তব্য নেই

১৮। উত্তর না হলে কারণ

- ☐ পর্যাপ্ত রোজগার নেই ☐ দ্রব্যমূল্য বেশি ☐ সরকারী সুযোগ সুবিধার অভাব
☐ খাদ্যগ্রহণের অভ্যাস ☐ অন্যান্য

১৯। আপনি ও আপনার পরিবারের সদস্যরা সাধারণত কোন কোন রোগে বেশি আক্রান্ত হন?

- ☐ জ্বর ☐ সর্দি/কাশি ☐ ডায়রিয়া
☐ পেটে ব্যথা ☐ চর্ম রোগ ☐ অপুষ্টি
☐ রাতকানা

২০। আপনি কি কোন প্রকার সরকারী সাহায্য পেয়ে থাকেন?

- ☐ হ্যাঁ ☐ না

২১। উত্তর হ্যাঁ হলে কি ধরনের?

- ☐ ভিজিডি ☐ ভিজিএফ ☐ বয়স্ক ভাতা ☐ বিধবা ভাতা
☐ কাজের বিনিময়ে খাদ্য ☐ সরকারী ঋন ☐ অন্যান্য

২২। সরকারী সুযোগ সুবিধা আপনার চাহিদা পূরণে কতটা সহায়ক?

২৩। খাদ্য নিরাপত্তা নিশ্চিতকরণে সরকারের করণীয় সম্পর্কে কিছু পরামর্শ দিন -

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ঘ.

ঙ.

২৪। আপনি কি মনে করেন আপনার জমিতে যে উৎপাদন হয় তা বৃদ্ধি করা সম্ভব?

☐ হ্যাঁ

☐ না

২৫। উত্তর হ্যাঁ হলে কিভাবে?

ক.

খ.

গ.

ঘ.

ঙ.

২৬। উত্তর না হলে কেন?

ক.

খ.

গ.

২৭। আপনার জীবন যাত্রার মান বৃদ্ধির জন্য কি পছন্দ অনুসরণ করেন?

ক. মাছ চাষ

ক. হাস মুরগী ও পশুপালন

গ. সবজি ও ফলমূল চাষ

ঘ. ক্ষুদ্র ব্যবসা

ঙ. অন্যান্য

