

## CHAPTER II

### LITERATURE REVIEW

#### 2.1 Concept and definition of food security

One of the very basic and essential needs of human being is adequate supply of food. The entire structure and function of the human population, therefore, revolves around the acquisition food (Pimentel and Pimentel, 1979). High priorities given to food by human being are documented in many historical books and arts. Historically, food value has been accorded top priority among all, and evidence shows that many festivals and ceremonies celebrate the successful harvest. Those may be the reason that Maslow put food for survival as the first and foremost basic need in the hierarchy of human needs. Similarly, the universal declaration of basic human right has recognized the right of adequate attainment of food as one of the basic human right (Maxwell and Frankenburger, 1992). Therefore, the importance of food security can be traced back to the history of human civilization and can be found interlinked with every sphere of human activities.

The definition of food security has been broadened since the First World Food Conference in 1975, immediately after the world food crisis of 1972-74. However, the global interest on food security has continued to grow after the mid eighties (Staaaz *et al.* 1990). Food security being an emerging issue, its definition has a great controversy and became a widely debated and much more confused. As the topic on food security grown up, it also became complex on conceptualization and definitional issue (Maxwell and Frankenburger, 1992). However, while conceptualizing the food security issue we always face two complex terms: food and security. Many literature on food security have referred to 'food' with the main concern on calorie based on the principle that other nutrients are usually satisfied when calorie intake is satisfactory. The second term

'security' has the concept of securing access to enough food over the time. So the term security has both entitlement and time dimension (ibid.). Colman and Nixon (1994) use the term food security as access to enough food for active and healthy life, and food insecurity as the lack of access to food. They differentiate malnutrition and food insecurity, as the former one is pathological symptom of the undernourishment. The committee on world food security has, however, given a basic definition of food security as the economic and physical access of food of all people at all time (FAO, 1989). Therefore, food security can be taken as the physical means of food sufficiency in the broader term of agricultural products. Food security at household level can further be defined as the ability of the household to secure enough food for its entire member (FAO, 1989). Sustainable food security, therefore, aims to achieve this goal without compromising the production capacity of natural resources, the integrity of biological systems and/or environmental quality (Gills, 1997). The food security concept address as people's risk of not having access to needed food, which may arises both from income and food production (Von Braun *et al.*, 1996).

## **2.2 Dimensions of food security**

As discussed earlier food security is achieved when all people at all time have access to food for healthy and productive life. Food security, however, means enough food access by all people at all time for an active and healthy life; its essential elements are, therefore, availability and ability to acquire it (Reutlinger, 1987 cited in Hossain, 1995). Food security relies on a number of factors and involves major three components: food availability (supply), stability (time) and accessibility (entitlement). Firstly, food availability is the basic concern of food security, which remove the fear of not enough supply of food. It refers to the need of producing sufficient food without compromising the depletion of natural resources (Haddad, 1997). Therefore, adequacy of food production and its supply is an important parameter of assessing food security. Based on the theme of food availability, Maxwell (1990) defines a country and its people as food

secured when their food system operates efficiently without threat of deficit food supply. Stability in the food supply, on the other hand, is another equally important aspect of ensuring food security. It is particularly important, when we are concerned with long-run food security. Sharp fluctuations in food supply seriously intensify the problem of food insecurity, malnutrition and hunger. Much of instability arises due to natural calamities, such as extreme weather variations, heavy infestation of diseases and pest etc. (National Academy of science, 1977). Since the frequent variations in food production can easily upset the stability of food supply and thereby its consumption, simply narrowing down the gap between the requirement and availability of staple food will be incapable of improving food security, if the enhanced supply is subject to year-to-year fluctuations. Supply stability is therefore, a major concern while analyzing the national level food security (Singh and Satis Babu, 1998). Furthermore, the time dimension of food security is equally important to determine the nature of food security problem. When individual or group of people suffers from food insecurity for all the time, they are considered as suffering from chronic food insecurity. Transitory food insecurity occurs when household faces temporary decline in the access to food. This may be due to temporary shortfall in food production because of drought, pest attack, and sudden unemployment. Transitory food insecurity may be either temporary for the short duration of seasonal/cyclical, which occurs, in a regular pattern (Maxwell and Frankenburger, 1992; Thomson and Metz, 1997). Therefore, under the transitory food insecurity there is a high chance of reversibility of the situation.

As, the core concept of food security relied on availability of and access to required food, it is entirely associated with the production, supply and purchasing power of household or nations or individuals. Increased physical availability is only a necessary condition to ensure food security unless it is backed up by the increased entitlement to food. Johnson (1984) cited in Perman *et al.* (1996), noted that a major change, which had taken place over the four or five decades to increasing access to food, was primarily dependent upon the increase in the family income. The noble laureate Amrtya Sen (1980) as cited in Maxwell and Frankerburger (1992) did the pioneering work on 'food

entitlement'. Although, food availability remains the key issue in food security, production and supply alone do not ensure food security, unless it is accessible to the needy. Based on the notion of Sen's 'entitlement' Maxwell and Frakerburger (1992) have define the most food secured household as those which achieve adequate access to food using a small fraction of their available resources. The most food insecure households, on the other hand, fail to achieve adequate food even in the expense of large proportion of their resources.

Hindle (1990) explains five major components of the World Bank approach of food security analysis; macroeconomics, microeconomics, food availability, food consumption, and markets (goods, labor and land). The macroeconomic aspect relates with global and national level food security, and the micro aspects deals about inter and intra household level food security issues (Singer, 1997). As food security analysis involves both macro and microeconomics concept of supply and demand analysis, food security can be seen basically at three levels: national and regional food security, household food security, and individual food security (Thomson and Metz, 1997). The interaction between all three level of food security analysis is depicted in Figure 2.1.

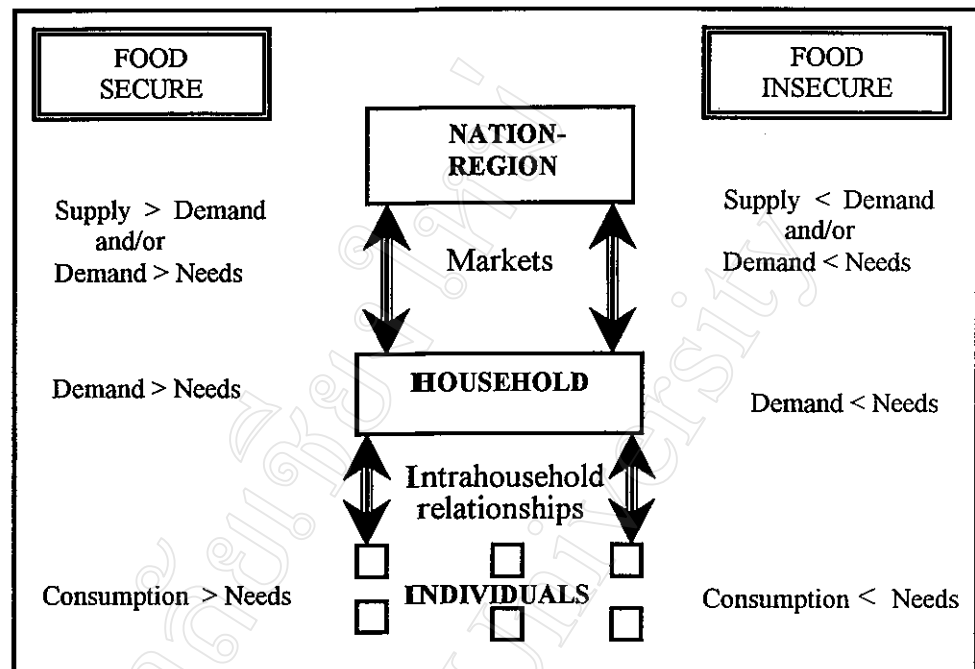


Figure 2.1. Different levels of food security analysis  
(Adopted from Thomson and Metz, 1997)

Since individuals or households with sufficient resources will have access to sufficient food, food insecurity and poverty can be seen as intertwined phenomenon (Von Braun *et al.*, 1996) as food insecurity is almost inevitable as a result of poverty. Therefore, poverty can be considered as one of the main determinants of food insecurity, as the poor do not have adequate means and entitlements to secure their access to food, even though there are ample supplies of foods in the market. Moreover, poverty leads disguised food insecurity through decreasing labor productivity and inefficient allocation of available resources (*ibid.*).

### 2.3 Gender and household food security

Literature on gender roles in the household food security describe that women's time allocation within the household is mostly devoted to feeding and care of household member, as it is considered that food management in the household is the social obligations and ritual duties of the women. According to the FAO (1996) report in the 'World Food Summit 1996 ' titled 'Women Feed the World' has clearly explained that women produce more than half of all the world food grown. Women in the rural areas are most exclusively responsible for the nutrition of their children and they are the principal producers and preparers for the rest of the family (ibid.). Therefore, women's role has assumed to be of central importance for the overall household welfare in general, and ensuring household food and nutritional security, meeting household basic needs in particular. The women's role in the household activities varies from society to society, and generally women activities are revolved more around the subsistence needs of the household (Falconer and Arnold, 1991). Instead of household daily chores, women's contribution accounts significant in the household cash generation from small scale cottage industries (e.g. weaving) particularly in the rural community (ibid.). In a study of five villages in India, Dasgupta and Maiti (1986) cited in Falconer and Arnold (1991), found that women contribute 19-50 per cent of the total household's income, in addition to spending about 4.8 hours/day in cooking and fuel-wood collection. Women play sequence of crucial role in the household food acquisition; they are concerned with the matter of cooking, feeding and processing. In many region of the world, women spend up to five hours per day on collecting fuel-wood and water, and up to four hours to prepare food (FAO, 1996.a). Regarding women's role in household food management, it is worth mentioning here a saying of a Bangladeshi woman quoted by Rizvi (1983). " It is getting dark, time for my husband to get back from work, and the children are asking for food, but I don't have any rice for the next meal. I have already borrowed yesterday form X. I don't know whom to app to app. I am really embarrassed to do it". Khare (1984) in his study on women's role in domestic food acquisition and food use in the

northern India has explained that women not only distribute cooked food but also control food waste and manage food storage, which has direct impact on household feeding management. A woman allocates her time and energy on food management, cooking and feeding according to the household circumstances and its priorities. In addition, rural women provide most of the labor for farming, from soil preparation to harvesting, storage, handling and processing. A woman's economic, biological and social roles cause conflicts when resources are inadequate. If food is inadequate, she must allocate it among family members. As a wife she is supposed to give her husband preference above herself and her children, but as a mother she should feed her more vulnerable children (McGuire and Popkinhe, 1988).

Many controversial statements can be found in many pieces of literature that whether women managed households are more prone to food deficit. Allen and Thopsom (1988) had concluded that the female headed households are significantly more likely to be in poverty than those households headed by the male. Although, many female-headed households are poorer than their male counterpart, there is impression that household food security and nutritional status of individual member in the household is significantly better in household headed by women (Kennedy and Peters 1992). Contrary to the above statement, the same authors in their study on households' food security and child nutrition in Malawi and Kenya have found higher calorie intake in male-headed households compared to female-headed households. Despite their findings, they have argued citing Von Brawn *et al.* (1991) that keeping household income constant, female managed households consume more calorie intake than male managed households. Similar argument is found in Kennedy and Cogill (1987) stating that children from the female-managed household consistently have better nutritional status. The logic behind this proposition has been explained as the higher proportion of women's income is spent on food compared to the income of their male counterpart. FAO (1989) reported that compared to men's spending pattern, women spending tend to be more on basic food supply. Appleton (1996) has, however, argued that when analyzing household welfare in

terms of consumption expenditure it does not significantly differ by the gender of household head but by the size of household. He found that the mean private consumption per capita was identical both in men-headed and women-headed households.

#### **2.4 Household food security and ethnicity**

Ethnicity and culture has great influence on household food production and consumption in the rural area. Therefore, their agricultural production and consumption behavior might have been influenced by the ethnic value and culture. Khare (1984) in his study in Northern India has found that *Brahmin* households had higher income and better living with smaller family size when compared with the schedule caste. Similar results have been reported by Conlin and Falk (1979) in the eastern hills of Nepal, indicating that *Brahmin/Chhetri* have better living standard and access to resources than other ethnic groups. Blakie *et al.* (1980) in their study in the western hills of Nepal reported a serious problem of declining food grain among the occupational caste groups, particularly leatherworker and tailor whose critical amount of food grain used to come from the obligatory payment (Locally called *Bali*). This situation has obliged many leatherworkers, tailors, and blacksmiths to become either laborers and/or porters (*ibid.*) for which they are not accustomed. This has virtually led to decreasing labor-productivity and access to food among the occupational groups of people.

#### **2.5 Household food security and technological change**

IFPRI (1989) research results have explored the mechanism that influence household food and nutritional security associated with technological change. It focused on identifying those intermediate factors that affect nutrition and food security. Those included were land tenure, access to inputs, extent of off-farm employment, women's workloads etc. In many cases it was found that even when the agricultural technologies



had improved, the food and nutritional security did not improve because of deterioration of those intermediate factors. Adoption and adaptation of agricultural technologies are important to improve agricultural production, which ultimately improve the income level and the household consumption. Von Braun *et al.* (1989) in their study on irrigation technology and commercialization of rice, and its effects on income and nutrition reported that adoption of modern rice varieties increased per capita food production and income, and the additional income generated by the poor households translated into more food energy consumption and improvement of nutritional level. They also argued that any additional income regardless of sources of income equally expended on food and non-food consumption. Therefore, under the market accessible condition, in order to alleviate rural poverty and food insecurity through agriculture-based program, it is not necessary to be limited to food crops but need to focus on the most effective way of promoting income growth among the rural poor (*ibid.*). On the other hand, Kennedy and Cogill (1987), and Von Braun *et al.* (1989) in their separate studies on effect of agricultural commercialization in income and nutrition reported that transformation of traditional agriculture to cash oriented agriculture has increased the income level of the farm household, but expenditure in food consumption increased less than non-food expenditures. Increased in food expenditure from additional income was at decreasing rate and was relatively less than expected.

## **2.6 Household food security and access to productive resources**

Access to productive resources like land and livestock, and off-farm employment opportunities are the key to identifying food security status of households in the rural areas. Land holding is important factor determining the total household production and consumption. Tschirley and Weber (1994) reported that land area cultivated is the principal determinant of calorie production and has positive or neutral effect of off-farm income and cash crop income on household food security. Livestock on the other hand are important from the households' income as well as household dietary diversification

point of view. Small livestock, which are often raised with small investment by feeding with household scraps are important source of cash and food, and are therefore considered important from the perspective of hedging against cash and food insecurity. Results from a study in Ecuador showed that at small-scale level, guinea pigs, which have very short reproductive cycle and fast growing were a more economical source of meat than pigs and cattle (FAO, 1984).

Livestock is one of the major forms of wealth and investment in the rural societies in the developing world, and is the major determinant of agricultural productivity in the subsistence farming (Castro *et al.*, 1981). It plays important role in farming systems in the developing countries: providing food, income, power, manure, and a means of disposing unwanted crop residues (FAO,1996.b). In other way, we can say livestock as an important means of converting other unused vegetation and crop by-products into high value milk and meat (FAO,1996.c). Citing the study results of Colclough and Fallon (1979) from Botsawana, Castro *et al.* (1981) stated that in the rural community, most of the total household income came from the contribution of animal. This Study had concluded that cattle ownership is the key determinant of total household income through: (a) increased income due to the total returns from animals; and (b) increased income form other sources made possible through cattle, e.g. increased area of cultivation, and increased agricultural productivity. Therefore, Livestock make an important contribution to the household food security directly providing animal food and indirectly through income generation and supporting crop production systems. FAO (1996.b) has clearly stated importance of livestock at farm level, characterizing livestock as liquid assets, a hedge against inflation, a means of reducing risks associated with crops, a source of regular income, a source of sporadic income, a source of power and an opportunity to increase off-farm employment.

## 2.7 Income and household food security

Income is often considered as the most influential economic factor affecting consumption. Consequently, higher income households have greater range of choices, and consume higher quality and quantity of food than do the poorer households. Diversifying income may reduce the risk to the household of any one source (Bilsborrow, 1991). Explaining the effect of increased income on food expenditure, De Vega and Fisher (1993) have described the Engel's law. As the income increases, the proportion of expenditure on different items in the budget changes, and the proportion to basic need (food for example) decreases and the higher proportion of budget goes to services and other non-food items. However, to the certain level expenditure on the food items increases as the income increases, since at the low economic level, demand for food is income elastic. Von Braun *et al.* (1989) and Kennedy (1983) reported that effect of increased income level had significant contribution on calorie availability at household level.

Non-agricultural sources of income are important to enhance food security as they increase the household's access to food. Among the poor households non-farm income sources are considered as the main sources of livelihood and are undertaken for sheer survival (Castro *et al.*, 1981). Non-farm income may also be an important source of capital, which can be invested in agriculture. Non-farm jobs like school teachers, government official and other officials are important not only from cash earnings point of view but also to increase individual access to information (*ibid.*). Von Braun (1995), however, argued that non-farm employment is not a panacea of poverty reduction and food security, it should be combined with the increasing labor productivity and assets generation (for example land improvement infrastructure) through utilization of technology.

## 2.8 Poverty and household food security

The link between poverty and food insecurity often found in many literatures, and the problem of food insecurity is almost always entangled with the poverty. Poverty analysis particularly in the developing world basically deals with income, consumption, and nutrition based on the notion of minimum income requirement to attain minimum calorie intake, below which the poor are classified as ultra-poor (Lipton, 1983 cited in Reardon and Vosti, 1995). Food insecurity and poverty are widely prevalent in those areas with unfavorable land like up-land condition for increasing agricultural productivity. The green revolution technologies were able to increase supplies of food grain only in the favorable climatic condition with sufficient irrigation infrastructures. Therefore, people living in the rainfed condition could not harvest the benefit of green revolution technologies. The situation has further aggravated by increasing population growth and dwindling natural resources coupled with lack of purchasing capacity and alternative opportunities for productive employment. As the demand for food grew with increased population, many developing land-scarce countries like Nepal, found difficulties to sustain the gain that they have made in achieving food security in the past (Hossain, 1995)

Poverty is the major determinant of household food insecurity. The poor do not have adequate means to secure their access to food. Increasing incomes of households can improve the food security status (Von Braun *et al.*, 1996). Therefore, Sen (1987) as cited in Hossain (1995) has emphasized the importance of people's purchasing capacity to ensure food security. He added, although, food may be available a segment of population might not have capacity to acquire it because of lack cash which is magnified by the lack of employment opportunity, low labor productivity, low wage rate, and finally the low level of income. Many rural poor households, therefore, diversify their income sources by spreading their labor time from own farm farming to seasonal or long-term off-farm and non-farm employment as part of their survival strategy.

## **2.9 Seasonality in household food security**

Seasonal variation in the household consumption pattern can be found especially in the rural poor household. Amar-Klemesu *et al.* (1995) in their study on household food security and food consumption pattern in the rural community of Ghana stated that per capita calorie intake was lowered just before the harvest season and was increased just after harvest. Describing the seasonality of food insecurity among the poor under the subsistence farming, Nabarro (1984) explains quoting Longhurst and Payne (1978) "towards the end of the dry season the poorer people, who may have no land or small plots and/or weak family labor, begin to suffer than others. They have less food because they have been able to grow less, have fewer livestock and less money. They may eat less to save food for crucial time of cultivation". The ways in which the poor deal with seasonal fluctuations are diverse. During the pre-harvest season when resources are depleted, the poor may sell off their assets to buy food, and seasonal migration might be the another way of dealing seasonal food scarcity (IFPRI, 1989)

## **2.10 Forestry and household food security**

Although own farm production always has been the mainstay of household food supply in many developing countries as it is a part of tradition and culture in the rural area, contribution of forest is also important from the household food security perspective. "Forests play crucial role in food security as they are the veritable source of biological diversity, and forest products are the mainstay of households worldwide" (FAO, 1996.d). Forests contribute to the diet of the forest dwellers and many others who live far from the forest. For the rural poor with little land or no land, forests may provide the main source of cash income. Jodha (1996) in his research results on common property resource management in India has explained that dependency of rural poor on the forest for fuel-wood, employment and income is quite higher than non-poor. Forest products like nuts, fruits, mushroom, rhizomes and leaves etc. are important sources of

food supplement in the rural areas and it is particularly important during the seasonal shortfall of food (FAO, 1989). Falconer and Arnold (1991) stated that other than direct contribution of forest product to household food supply, forests also contribute indirectly to the poor household through income and employment generation. The most direct link between forestry and food security is the food items produced by the forest trees; huge arrays of edible foods as the supplement of staple foods are gathered from the forest. In addition, forests play important indirect role in food security through improving soil fertility and supplying fodder and forage to the livestock (FAO, 1989). A great deal of works done in the past has made clear the important linkage between forest and food security, however, the nature of dependency on forest varies from place to place (Lonhurst, 1991). Wide range of people are dependent on forest food, but among those the most dependent on forest for food are the poor and land less (ibid.). A study carried out in a remote village near the forest with insufficient rice production in the North East of Thailand revealed that forest as the main source of vegetable and ranked as the second major source for animal food. In terms of total food quantity excluding the staple food rice, the forest was the main source of food, followed by the household production (Saowakontha *et al.*, 1991 cited in Lonhurst, 1991). Albeit, assessment of forest contribution to the overall households food supply is not easy to measure as forest food are gathered whenever and wherever available. Emphasizing the diversity of forest products and their role in food security, Lindsrrom and Kingamkono (1991) have explained that although, little information exists on the seasonality, frequency, amount and quality of forest foods consumed, their diversity alone plays significant role in supplementing the diet of certain population. Consumption of forest food increases palatability of bland staple food. Forest foods for example berries, nuts, and leaves make significant contribution on resolving specific nutritional deficiencies. Mostly the local inhabitants of forests consume such foods particularly in the food deficit period (ibid.). Therefore, importance of forest foods is greater amongst the poorer section of the society during the agricultural lean season.

### 2.11 Home gardening and household food security

Homestead garden adjoining the dwelling unit plays important role in the household food security. Homestead production system is generally considered as a subsystem of the whole agricultural systems aiming at producing fruits and vegetables for household consumption. Homestead gardens are highly intensified with large number of plant species, which provide households with multiple sources of food and nutrition. The products of homegardens are usually consumed in the households and the excess is often sell in the local market. Therefore, homegardens are considered as important source for both household nutrition as well as cash income (Thrupp, 1998). Falconer and Arnold (1991) emphasized the important role the homestead gardens played in household food security giving the example of Java in Indonesia, where about more than 40 % of the total calorie intake are supplemented from home garden in some areas. Abul Salam *et al.* (1998) has reckoned that the home gardens in the Kerala in India with multi-stories cropping have multi-purpose: food, fodder, fuel wood, organic mulch etc. Home gardens are often combined with the livestock rearing, where the system components interact synergistically to sustain productivity (*ibid.*).