

CHAPTER 2

FOOD SECURITY AND COMMERCIALISATION: DEFINITIONS AND THEORETICAL FRAMEWORK

2.1 INTRODUCTION

Parallels can be drawn between food security and agricultural commercialisation. The lack of food security contributes to reduced work performance and therefore loss in productivity. In school going children, it contributes to lower school performance (Von Braun, Bouis, Kumar & Pandya-Lorch, 1992). Food security is therefore an integral part of development. On the other hand, agricultural commercialisation is generally associated with increased production, improved welfare and modernisation (Hinderink & Sterkenburg, 1987; Makhura, Coetzee & Goode, 1996; Von Braun, Bouis & Kennedy, 1994), i.e. economic development.

Despite both being important factors in the development process, the potential conflict between them has been and remains a concern. On the one hand, the conflict between non-food cash crops versus food crops focuses on the competition for resources. Land, for example, is the major constraint to expanding agricultural production in Kenya. Less than 20% of the land area is of medium to high agricultural potential and 60% of the remainder is desert area with limited potential. A serious competition between cash and food crops for land is therefore a major concern for food security (Shapouri, Missiaen & Rosen, 1992). Nyangabyaki (1995) reported that in Uganda the famines of 1908, 1914-15, 1917-19 and 1928 were partly due to labour constraints aggravated by the promotion of export crops at the expense of food crops.

On the other hand, as food increasingly becomes a means of earning cash income in the SSA region, this conflict is shifting to include a competition between needs, i.e. non-food needs versus subsistence needs (Mbiha & Kashuliza, 1994; Shapouri et al., 1992). Maize, for example, uses 70% of the land under cultivation in Zambia. It is the staple food but also provides 90% of cash receipts of small-scale farmers (Mckenzie & Chenoweth, 1992). In Kenya, maize occupies about 25% of planted area, remains the most widely

eaten staple food and accounts for about 50% of the value of marketed production (Shapouri et al., 1992).

This chapter reviews both concepts of food security and agricultural commercialisation and how they are defined in the literature. Each concept is then defined within the context of this study, i.e. food availability and the proportion of food sold relative to production respectively. The two concepts are then reviewed in relation to each other and with examples drawn from studies done within the SSA region. However, commercialisation is not the only factor that contributes to food insecurity and some factors that have rendered people in the SSA region vulnerable to food insecurity are highlighted.

2.2 DEFINITIONS OF FOOD SECURITY AND COMMERCIALISATION

2.2.1 Defining food security/insecurity

Food insecurity as a development issue came to the fore following the world wide food shortages of the early 1970's. From a focus on aggregate (national or regional) supply shortfalls, it has since evolved to a focus on individual and household needs (Maxwell, 1996; Staatz, Agostino & Sundberg, 1990; Von Braun, 1990). A widely used definition of food security is:

... "access by all people at all times to enough food for an active, healthy life. Its essential elements are the availability of food and the ability to acquire it" (World Bank, 1986:1).

On the flip side, food insecurity is the lack of access to enough food. Chronic food insecurity arises from a continuously inadequate diet caused by the inability to acquire (either producing or buying) enough food. Transitory food insecurity is a temporary decline in a household's access to enough food. It results from instability in food prices, food production, or household incomes and in its worst form it produces famine (World Bank, 1986).

From a more aggregate perspective, Eicher & Staatz (1985: 216) defined food security as:

...“the ability of a country or region to assure, on a long term basis, that its food system provides the total population access to a timely, reliable and nutritionally adequate supply of food”.

A food system is the combination of agro-ecological and socio-economic processes determining the production, marketing and consumption of food (Maxwell, 1991). To ensure that food security at any level is attained, many factors therefore need to be taken into consideration. Often, they can be categorised into whether they affect supply and/or demand. Supply is a function of production, storage and trade and although availability of food is a necessary condition for food security, it does not necessarily ensure accessibility. Demand depends on income and resource control and ultimately determines one's ability to access food, i.e. one's entitlement according to Sen (1998).

2.2.2 Levels and measures of food insecurity

Food security can be evaluated at different levels and different indicators are needed to assess the different dimensions of food security. Food self-sufficiency is a fair proxy for national food security but may not give a fair representation of food insecurity among the population. An example is South Africa, though considered food self-sufficient, it was estimated that 21% of the urban population and 63% of the rural population lived below the minimum subsistence level. The country was therefore characterised as having surpluses and exports amid food shortages (Van Zyl & Kirsten, 1992). Similarly, in Uganda despite national food self-sufficiency, many in its population suffer from food insecurity. Household food security best indicates the distribution of food in a population.

Food security may be distinguished on the basis of the source of entitlement. In predominantly agrarian economies, in rural areas where agricultural production is the main source of entitlement, the levels of output largely determine food security. Access to factors of production is therefore crucial to food security. In the urban areas where food is mainly purchased, employment and levels of income are the more important. The

distinctions between urban and rural food security have important policy implications, e.g. extension, research priorities, transport, employment, marketing, etc.

An adequate intake of food is better considered for specific socio-economic groups as nutritional needs vary across population groups, gender, age and activity. Nonetheless, for an individual their food security situation is evaluated by caloric consumption levels or by data about their weight, height and age, i.e. anthropometric measures (FAO, 1999b; Von Braun et al., 1992). These are the basis of two distinct and useful measures of food security, under nourishment and under nutrition respectively.

An important age bracket to which anthropometric measures are often applied, is children up to 5 years old who, because they are in a period of fast growth, are highly vulnerable to nutrition deficiencies (Kennedy & Cogill, 1987; Pacey & Payne, 1985). However, ratios calculated from anthropometric measurements indicate the outcome of not only inadequate food intakes, but also of poor health and sanitation conditions that may prevent people from deriving full nutritional benefits from what they eat. In Sudan, it was found that the direct effects of per capita cereal consumption (food shortages) on child nutrition though small, was statistically highly significant. Second to food shortages was the diarrhoea variable (Teklu, Von Braun & Zaki, 1991).

Similar findings were made in Rwanda (Von Braun, De Haen & Blanken, 1991). The calorie-consumption effect was positive and highly significant. A 10% increase in the level of calories consumed (2,000 calories per adult equivalent) *ceteris paribus*, was related to an 8% increase in weight-for-height, a 2.3% improvement in the height-for-age and a 2.9% improvement in the weight-for-age in children. However, the health and sanitation-related variables showed more sizeable effects. Access to a clean toilet, representing improved household sanitation conditions, was related with a 33% improvement in both height-for-age and weight-for-age indicators. Worm infestation in the children was associated with a 17% reduction in the long-term nutritional indicator, height-for-age. A study done in Zimbabwe (Chisvo & Jayne, 1992) found that the major contributory factors to child malnutrition were: early weaning due to pregnancy, diarrhoea, shortage of foods to balance the starchy foods, poor management of financial resources, alcohol abuse, poverty and inadequate health services.

The relationship between food intake, under nourishment, under nutrition and health, sanitation and care, has been illustrated by FAO (1999b) and is shown in Figure 2.1.

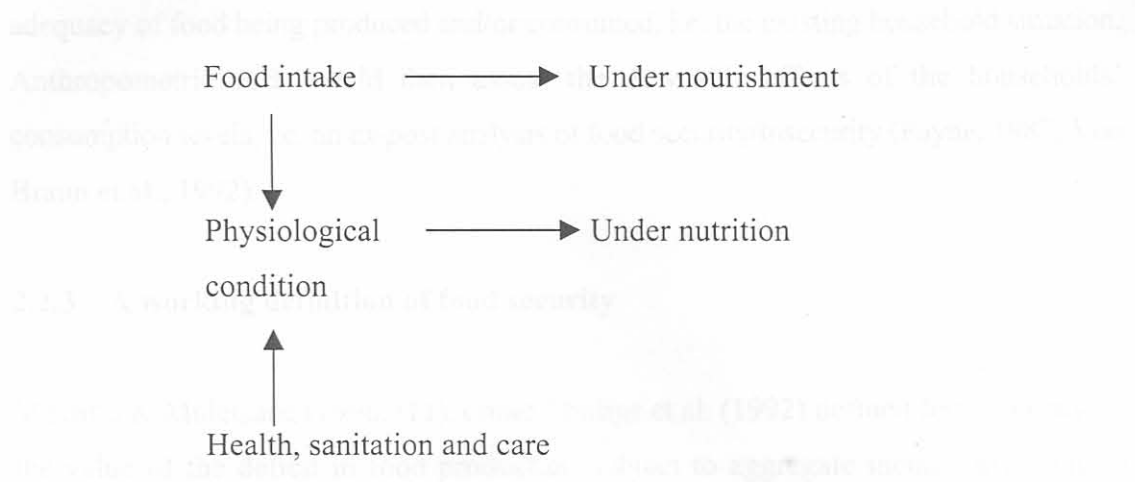


Figure 2. 1: The relationship between food intake, under nourishment and under nutrition

A high correlation also exists between nutritional status and wealth. A study done in Sudan found that children in urban areas, with access to a more balanced diet than their counter parts in rural and nomadic areas, were both heavier and taller (Amin & Grobler, 1991). They also found that children from households consuming sorghum and wheat were heavier on average than households consuming millet. Children from households where wheat was the staple food were taller than children from households where millet was the staple food. Wheat is more expensive than either millet or sorghum.

The same study (ibid.) also found that the relationships between levels of thinness and six conditions (diarrhoea, vomiting, acute respiratory infection, fever, measles and night blindness) were highly significant. Other factors associated with nutritional status were the mothers' education, parental literacy and fathers' occupation. Conclusively, the findings were that under nutrition in Sudan is both a structural and food deficit problem; the result of ignorance, lack of purchasing power, the non availability of subsistence food, and the high prevalence of communicable diseases (ibid.). Under nutrition, because it too is multi-factorial, on its own is thus not conclusively an indicator of food insecurity.

Given all these valid arguments, combining different dimensions of food security for a complete evaluation is often necessary. Household surveys for example may capture the adequacy of food being produced and/or consumed, i.e. the existing household situation. Anthropometric data would then assess the downside effects of the households' consumption levels, i.e. an *ex-post* analysis of food security/insecurity (Payne, 1987; Von Braun et al., 1992).

2.2.3 A working definition of food security

Mekuria & Moletsane (1996:311), citing Phillips et al. (1992) defined food security by the value of the deficit in food production subject to aggregate income available to purchase food. In a study of household food insecurity in the Northern Province of South Africa they postulated that:

$$\text{FPDhh} \leq \text{ILAhh}$$

Where:

- FPDhh is the value of a household's food production deficit (the difference between the value of production and consumption).
- ILAhh is the sum of income and value of liquid assets available to purchase food.

In their analysis, Mekuria & Moletsane (1996) focused on maize because it is widely consumed in the study area and implied that it is produced for subsistence purposes only. Maize meal would be bought to meet production short falls depending on income availability otherwise the household is rendered food insecure. The inapplicability of this definition to this study arises from a number of issues.

- i) Food production is assumed to be for household consumption whereas food, this study argues, has a variety of uses including generating cash income.
- ii) Cash income may be spent on meeting competing non-food needs and not necessarily on food needs. Furthermore, power relations within the household, i.e. who in the household controls the resources (including income) determines

whether the welfare of the household including its food needs is catered for. Income controlled by women has been shown to benefit the welfare of the household more than that accruing to men (Von Braun et al., 1992; Von Braun, Johm & Puetz, 1994).

- iii) The nature of the food basket differs across the study area and assuming that income was mainly spent on food, whether the deficit is met would depend on the foods that are bought.

Income would therefore provide a poor estimate of food deficits or surpluses in this study. For that reason, a working definition of food security involving the calories available to the household for consumption is proposed. On average, it measures the food available to a person compared against the minimum requirements (FAO, 1998b). However, by focusing primarily on household food availability as a measure of food security, the study abstracts from the two important inter-linked factors, the role of health, sanitation, and care and intra-household distribution in food security (it says little about an individual's intake).

Calorie availability has other shortcomings. Schiff & Valdes (1990) argue that by comparing calorie and other nutrient intake with requirement standards to estimate the number of hungry and undernourished people, the impact of the input of attributes that are of a non-nutrient nature, and household preference are not considered. Furthermore, that the problem of adequacy may or may not reveal as a nutrition problem and a nutrition problem may not be a result of inadequate food supply. It is also argued that the caloric measure cannot be uniformly representative given the diversity in human physiology and socio-economic and agro-ecological circumstances all of which affect the requirements of an individual (Maxwell, 1996; Pacey & Payne, 1985). Nonetheless, because of the inconclusive relationship between food intake and under nutrition discussed earlier, per capita dietary energy supply is considered the most important single indicator for estimates of food adequacy levels (FAO 1998b). It has variously been applied in the literature (Chisvo & Jayne, 1992; Strauss, 1984; Tshirley & Weber, 1994).

Sadoulet & De Janvry (1995:134) in reference to a study they had done in India and with a focus on national food security, used the concept of food availability to characterise food security. They defined it as:

Net Availability = net production + imports - increase in stocks.

Availability being:

...“an aggregate concept of final consumption, sometimes called “apparent consumption” or “disappearance” as opposed to a measure taken directly from the observation of consumption itself”... (ibid.: 130).

Translating this to the household level, and drawing from the conceptual framework in the previous chapter, food purchases are analogous to food imports and the increase in stocks to household food stocks. Food that is in-store is still potentially available to the household but may not necessarily be consumed as some may be sold. Since consumption is assumed to have occurred, food in-store is not included in the food availability equation. Food that has been sold ceases to be available for household consumption except through income effects, i.e. if income generated is used to purchase food. Household food availability is therefore estimated as follows:

Household Food Availability = (food produced + food bought) - (food sold + post harvest losses + food in-store)

Availability could have been evaluated in terms of actual food quantities, but given the diversity in dietary habits the caloric measure is preferred because it allows for standardisation across different foods. Coupled with adult equivalents as the unit of consumption, standardisation across household demographic differences is possible. The caloric measure also allows for an evaluation of the spread and the depth of food insecurity, enabling the distinction between different levels of food security/insecurity. This would be comparatively less straight forward with actual food quantities because of the diversity in foods that are regularly eaten.

According to respondents of the study, as advocated for by Maxwell (1996), having insufficient own-produced food, or relying on neighbours, relatives or the market for food (especially their staple food), all constitute a state of food insecurity. Grain purchases often show that a household has run out of food to meet family consumption requirements or is at risk of doing so. Theoretically, their ability to purchase food would

place them among the food secure. Their own definition takes cognisance of the unreliability of the market given existing market failures, but more important, of the fact that they are often income constrained.

2.2.4 Defining agricultural commercialisation

The definition of the commercialisation process varies. The most commonly used is the orientation of agricultural production, i.e. the extent to which production for sale prevails over that for self-consumption. From this perspective, several indices may be used to characterise a commercial farmer. These include the value of output sold in proportion to the value of total output and the importance of purchased inputs in production (Von Braun, Bouis & Kennedy, 1994).

Cited in Makhura (1994), Wessels-Bayer (1990), in a study done in Swaziland to establish characteristics that distinguished commercial maize farmers from the rest, defined commercial farmers by output relative to requirements. Those producing more than 200% of their consumption requirement were considered commercial, those producing between 100 to 200% of their requirements as sufficient, and those producing less than 100% as deficit or subsistent. Also cited in Makhura (1994), Steward (1985), in a study done in Zambia, defined commercialisation by the proportion of cultivated area under marketable crops, making adjustments for dual-purpose crops. Latt & Niewoudt (1988) in a study in Kwazulu in South Africa, defined commercialisation as any market-related activity directly related to the agricultural production activities of the household.

Other aspects of commercialisation focus on the qualitative characteristics of the producer in relation to their attitudes, motivations and behavioural patterns. These are evaluated against that of “ideal-type” subsistence and commercial farmers. For example, it is often said that subsistence farmers are resistant to change. Yet, others focus on the characteristics of the community, emphasising socio-cultural rather than behavioural characteristics. Others look at it as a process associated with social change (Hinderink & Sterkenburg, 1987).

The definition of a commercial farmer is therefore circumstantial. This study, following Hinderink & Sterkenburg (1987: 19) broadly looks at the commercialisation process as:

... “involving a deliberate action on the part of agricultural producers - of their own free will or by means of coercion - to use the land, labour, implements and annual inputs in such a way that a greater or smaller part of the crops produced and/or animals raised is for exchange or sale.”

2.2.5 Working definition of commercialisation

Although this study focuses on commercialisation within the context of food crops, the commercialisation has been an on-going process. Several projects/schemes were established across the SSA region introducing new crops or promoting particular crops for purposes of generating foreign exchange, providing raw materials for industrialisation programmes, creating a taxable economic base and improving the livelihood of the producers. In Uganda, the main cash crops grown by small holder farmers were coffee, cotton and tobacco. To de-link the performance of the economy from the effects of the international commodity markets, non-traditional agricultural exports (NTAE's) many of which are food crops, have been promoted. The commercialisation of the food sub-sector through the promotion of NTAE's is also an integral component of the poverty eradication programme for among others equity reasons (Uganda-Ministry of Finance and Economic Planning, 1996).

The promotion of the use of food for cash generation seems to rest on two assumptions with potential implications for food security thus:

- i) Increased production beyond household needs, allowing the maintenance or improvement of the food security status and generation of cash income.
- ii) Production levels remain the same but the increased cash income allows households to meet their food needs through increased food purchases.

Not only do incentives for farmers to engage in producing food for the market exist, but food crops compete favourably with the traditional cash crops (Bibagamba, 1996) as seen in Table 2.1. Returns to family labour from improved maize and beans, matooke (green

cooking bananas, a staple food in many parts of the country), sweet potatoes, cassava, millet, groundnuts and simsim (sesame) all outweigh that from either cotton or tobacco.

Table 2. 1: Gross margins and returns to family labour - July 1994

Crop	Farm-level crop output to input ratio	Returns to family labour (shs/ha/manday)	Gross margin (shs/ha)
Coffee-unimproved	3.78	5,612	625,347
Coffee-improved	4.60	11,723	1,617,758
Tea – out growers	0.97	864	179,906
Flue cured tobacco	1.31	1,874	637,313
Fire cured tobacco	1.05	1,075	270,967
Cotton – hoe & spraying	0.87	746	94,018
Cotton ox-plough	0.93	716	52,246
Vanilla	6.62	8,348	2,512,854
Passion fruit	5.73	15,952	1,754,748
Pineapple	3.38	5,888	1,677,956
Matooke (bananas)	1.65	2,842	517,220
Groundnuts (local seed)	1.18	1,266	194,191
Maize – improved	1.14	2,244	132,412
Maize – unimproved	0.80	632	90,412
Beans – improved	1.76	3,425	208,924
Beans – unimproved	1.01	968	125,834
Simsim	1.15	1,180	134,482
Sweet potatoes	2.20	3,464	405,301
Cassava	1.54	2,133	392,544
Millet	0.99	928	127,100
Sorghum	0.98	918	122,040
Rice (Paddy)	1.37	2,150	294,482

Source: Agricultural Secretariat, cited in Uganda–Ministry of Agriculture Animal Industries & Fisheries, 1997

Given that subsistence needs remain predominantly produced by the household, food needs are either way rendered dependent on how much food is left or bought back for consumption. Theoretically it is argued that production and consumption decisions are separate and only linked by the profits from sales when prices are exogenous (Sadoulet & De Janvry, 1995). The implication being that the producer does not necessarily have to take into consideration his consumption needs when deciding what to produce because the income that is generated can be used to buy food. In contrast, subsistence oriented producers have to take into consideration their consumption needs when deciding what to produce.

While prices undoubtedly are exogenous to the producer, the price gradient between the rural and urban markets would favour urban rather than rural consumers who depend on the market. The producer's decision to sell and how much to sell, are subject to meeting the household's food requirements. Even with market integration, a situation of non-separability between quantity sold and that left for consumption exists given that sales implicitly determine consumption. This is similar to that between production and consumption under conditions of self-sufficiency. A balance between food needs (proportion left for consumption) and the competing needs, is therefore critical for food security. The negative impact of food sales on food security therefore potentially exists.

Against this background, the working definition of commercialisation in this study is in terms of marketed output relative to total output. The higher the quantity of food sold relative to output, the more commercial a household is regarded to be, *ceteris paribus*. This definition is akin to one by Von Braun, Bouis & Kennedy (1994:12) and applied by Strasberg, Jayne, Yamano, Nyoro, Karanja and Strauss (1999).

On the output side, Von Braun, Bouis and Kennedy (1994) postulate that:

$$\text{Commercialisation of agriculture} = \frac{\text{Value of agricultural sales}}{\text{Value of agricultural production}}$$

The duration of the study is relatively short, i.e. one year, and average prices of the different commodities are therefore assumed constant. Quantities rather than values are therefore considered the more appropriate in this analysis. A commercialisation index, HCI, was generated on the basis of the caloric equivalents of the quantities of food produced and sold by a household.

$$\text{HCI} = \frac{\text{Sum of caloric equivalents of food sold}}{\text{Sum of caloric equivalents of food produced}} * 100$$

However, ratios have a limitation in that they are scale neutral and do not distinguish between levels of production. A farmer producing 4 bags of maize and selling 2 is as commercial as that one producing 30 bags and selling 15 bags.

As commercialisation progresses, a shift towards the use of traded inputs is expected (Pingali & Rosegrant, 1995) and the comparative use of traded inputs can therefore be used as an indicator of commercialisation (Von Braun, Bouis & Kennedy, 1994). They postulated that on the input side:

$$\text{Commercialisation of agriculture} = \frac{\text{Value of inputs acquired from the market}}{\text{Agricultural production value}}$$

Limited use of purchased inputs was observed during the study and has been reported as the case for agriculture in Uganda in general (Uganda-Household Agricultural Support Programme, 1997). This, therefore, is considered inappropriate as an indicator of commercialisation in this study. Furthermore, the emphasis on purchased inputs excludes intensification in production that may arise from improved agronomic practices, or even the use of other yield enhancing inputs not necessarily purchased from the market, e.g. organic manure.

2.3 FOOD SECURITY AND COMMERCIALISATION

Being a necessity for life itself, it is only rational to assume that people will go to extra lengths to ensure that their food needs are met and that “food first” guides the allocation of household resources. In this context, Roumasset’s argument that the risk of food insecurity (RFI) is the probability that the value of production deficiency (VS) is greater than the relevant exchange entitlement (EE) is applicable (Roumasset, 1982).

$$\text{RFI} = \text{Probability (VS} > \text{EE)}$$

$$\text{VS} = P (\text{Rc} - \text{Rp})$$

Where:

P = gross import price of grain (includes internal and external marketing costs)

Rc = grain consumption requirement

Rp = grain production

EE = the sum of liquid assets and other income that can be used in exchange for grain.

The risk of food insecurity in rural areas is equated to a deficiency in production because subsistence oriented production is assumed. By evaluating this deficiency against EE, a “food first” principle in the use of household resources is also assumed. While subsistence orientation remains an important aspect of agricultural productivity in much of the developing world, purely subsistence households are hard to come by. Many farming populations, even those commonly categorised as subsistence farmers, consume goods and services provided by the market. They may therefore be considered to be at different stages of transition to commercialisation, an integration of agriculture in which they are mainly engaged, into the rest of the economy. The transition from subsistence to commercialisation encompasses gradual changes in production systems, producer objectives, and the contribution of the agricultural sector to household income. As a means by which households can derive additional utility from consumer goods, commercialisation spurs on economic growth (Henderick & Sterkenburg, 1987).

The factors that may trigger the commercialisation process are rapid technological change in agricultural production, improved infrastructure, diversification in food demand patterns, economic growth and urbanisation. These changes are illustrated in Table 2.2, adapted from Pingali & Rosegrant (1995).

Table 2.2 Characteristics of food production systems with increasing commercialisation

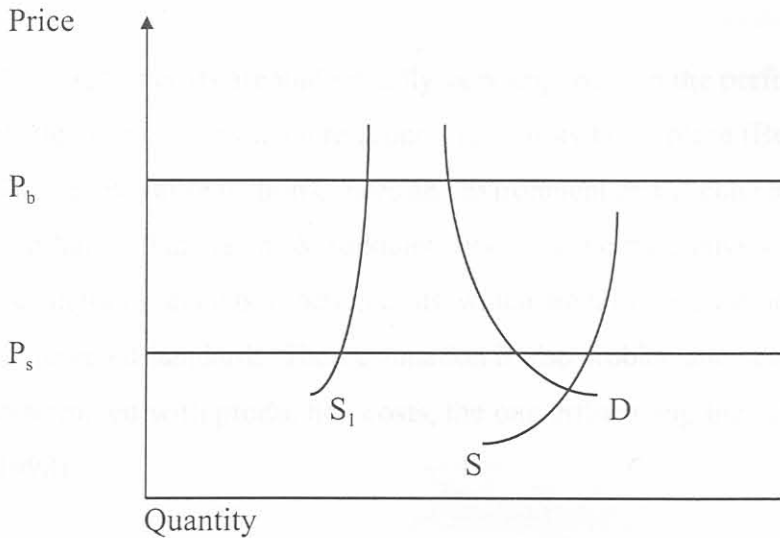
Level of market orientation	Farmers' objective	Sources of inputs	Product mix	Household income
Subsistence systems	Food self-sufficiency	Household generated (non-traded)	Wide range	Agriculture is predominant
Semi-commercial systems	Surplus generation	Mix of traded & non-traded inputs	Moderately specialised	Agriculture and non-agricultural
Commercial systems	Profit maximisation	Mainly traded inputs	Highly specialised	Mainly non-agricultural

Source: Adapted from Pingali and Rosegrant, 1995

In the early stages where there is little specialisation, markets are imperfect for local produce and few mechanisms exist to cope with risk of crop failure that would threaten consumption. A high degree of correlation in levels of output exists between households facing the same climatic and socio-economic conditions (Roumasset, 1982; Sadoulet &

De Janvry, 1995). The market implications are that prices principally depend on local supply and demand conditions as illustrated in Figure 2.2 below.

When a household/individual decides to sell their surplus ($S - D$), i.e. supply in excess of demand, in an average year they face a market price P_s . In a less than average year where shortfalls in production are realised, S_1 and households are rendered buyers, prices are driven up by local demand to P_b . However, the local demand, cannot be met from the supply and some intervention by the market (food imported into the area) or the public sector is necessary to meet the demand. It is to circumvent such price differences that households are inclined towards food self-sufficiency.



Source: Adopted from Roumasset 1982

Figure 2. 2: Prices under local supply and demand conditions

As production evolves from subsistence to commercialisation, market integration opens rural markets to supply and demand conditions beyond the local area. By limiting the extent to which local supply and demand conditions adversely affect prices and availability, the need for self-sufficiency is reduced (Fafchamps, 1992; 1998). Wealth or increased profitability should enable consumption smoothing, also reducing the need for self-sufficiency. Implicitly, food security as a primary objective of the household can then be ensured either through own-production or an increased use of the market as a source for food.

However, with increasing commercialisation, farmers have to learn to cope with market related risk that is of little concern to subsistence farmers (Timmer, 1997). Localised shortfalls may be due to low production or market-induced, pushing the prices to P_b , affecting both sales and consumption decisions (Roumasset, 1982; Von Braun, Bouis & Kennedy, 1994). In Zimbabwe, for example, 75% of grain-deficit households interviewed in selected rural areas, bought the more expensive urban-milled meal because grain was not available locally (Jayne & Chisvo, 1992). The more risk-averse households would be more subsistence oriented, insulating themselves from such market-induced risks (Fafchamps, 1992).

2.3.1 Commercialisation, transaction costs and food security

Transaction costs are undoubtedly very important in the performance of any economy; the lower they are the more economic activity takes place (Benham & Benham, 1998). Their removal/reduction creates an environment that is conducive to commercialisation (De Janvry, Fafchamps & Sadoulet, 1991). Economic analysis must therefore make some assumptions about transaction costs, which are however, variously defined with a variety of accepted standards. Their estimation is also problematic because they are often jointly determined with production costs, the one influencing the other (Benham & Benham, 1998).

In marketing, transport costs and mark-ups (rent seeking by different actors in the marketing chain), form the bulk of explicit transaction costs. In Siaya District of Kenya, because of poor infrastructure, maize prices were estimated to be 12% above market price. Without transport costs, households would be more export oriented, i.e. grow cotton and use the income to meet their food needs. Because of the costs, they withdraw from the maize market and engage in maize production. In so doing, they fore-go income (Kshs 1,244) that would be generated by the highly paying cotton crop but is offset by the implicit savings (Kshs 1,957) on food expenditure (Omamo, 1998).

Economic reform programmes in the SSA region have given due emphasis to improving efficiency of production and marketing systems by the reduction of transaction costs and barriers to entry. In Uganda, this focus has mainly been on the improvement of transport

systems and removing/reducing barriers to market competition. Reducing transaction costs should in turn increase production, incomes and ultimately demand.

Studies examining the degree of market integration, a measure of market efficiency, show a trend towards long-term market integration and the increasing efficiency in price transmission. Urban markets are often found to be better integrated than rural markets which are segmented in the short term, largely due to poor market information and transport infrastructure (Kherallah, Delgado, Gabre-Madhin, Minot & Johnson, 2000). In Malawi, prices in maize markets exhibited a stable long-term relation and were therefore co-integrated. The number of markets that were integrated increased after market liberalisation in 1987 (Goletti & Babu, 1994 cited in Kherallah et al., 2000). However, they found that price transmission between the markets was low, calling for more investments in market infrastructure. This finding was contrasted to that of Benin (Lutr, van Tilburg & van der Kamp, 1995, cited in Kherallah et al., 2000) where the maize market was not affected by government interventions and therefore the effects of market reform.

However, the effects of the market reform are relative to other factors in the economy, drought, war, enterprise substitutability etc. and it is difficult to draw generalised conclusions. In Ethiopia grain price liberalisation had the effect of increasing the producer share of the retail price and the real average prices in terminal markets declined as did the co-efficient of variation in grain prices (Negassa & Jayne, 1996, cited in Kherallah et al., 2000). However, despite increased market integration in Malawi, production has not risen primarily because real producer prices have not risen. Rather, an inverse relation between maize production and the relative price of cash crops was observed (Sahn & Arulpragasam cited in Kherallah et al., 2000). Nonetheless, it is estimated that the transport and marketing of food grains can cost up to 70% of product values (Ahmed & Rustagi, 1987 cited in Kherallah et al., 2000) and a lot more remains to be done in reducing the costs of marketing transactions.

However, while emphasis has been paid to reducing the explicit transaction costs mainly entailed in the marketing system, it is noteworthy that transaction costs may also be implicit. These implicit transaction costs include the costs of information, the opportunity cost of time spent searching and negotiating, and costs that arise from the participant's

social status in its community, e.g. gender, ethnicity & political links. These therefore make the transaction costs more area or individual specific.

However, Benham & Benham (1998) argue that in addition to transaction costs it is necessary to take into consideration the opportunity costs of a transaction and the different needs of those involved. To understand the choices made, this needs to be established not only where a transaction takes place, but also where it does not. Some opportunity costs like that of the time spent in carrying out a transaction or that of post harvest losses due to poor storage or pest damage, can be quantified. However, quantifying others such as the inconvenience caused by using living quarters for storage or of inadequate food today compared with the short and long-term effects of health or education, is difficult. It is certainly difficult given the nature of the commodity, food, which is life itself. What is its opportunity cost? It is also important to take into consideration that farmers are often price takers whose choices are limited by the market opportunities.

While transaction costs focus on factor or product commodities, the market is also a means of social interaction and information exchange, often as intrinsic components of the commodity transactions. Besides making a commodity purchase or sale, a common response to why they went to the markets, was to meet other people (Group discussions, 1998; Questionnaire responses). These intrinsic components of a transaction are however, difficult to price.

The effects of commercialisation on different segments of the population, e.g. men and women, would also differ because of differences in resource accessibility and control (Von Braun, Bouis and Kennedy, 1994). Contrary to unitary decision making models, men and women are known to generate and control income separately, i.e. non-income pooling (Smith & Chavas, 1997). This implies that different members of the household may face different transaction costs.

Against this background, the law of one price does not apply across households. At any given price, some households will carry out transactions and others will not, depending on the household's transaction and opportunity costs for a specific transaction (Benham & Benham, 1998; De Janvry et al., 1991). De Janvry et al. (1991) posit that the decision

to participate in the market as a buyer or seller is guided by an endogenous price band within which each household operates. Goetz (1992) finds that improved market information increased the probability that households selling coarse grain participated in the market. On the other hand, a higher price of coarse grains significantly raised the probability that a household participated in the market as a buyer; higher prices could signal impending food scarcity that would require the stocking up of food.

While theoretically a price band may exist, the determination of the bounds in practice must take into consideration the price variable, transaction costs and the opportunity costs to which food sales may be tagged, e.g. health, education, leisure etc. It has been argued that people are often quite prepared to endure considerable degrees of hunger to ensure their existence in the long term or if the opportunity cost is an investment for a better tomorrow (De Waal, 1991). Preserving seed for planting, avoiding the sale of an animal, or investing in education are some examples. In a study done in Sudan, despite having eaten once in a day or two days, famine migrants often sold the food they were given and used the proceeds to do something they considered more important. These were things like fodder for an animal or transport back home to cultivate their gardens.

It is therefore necessary to look at food needs as one of many that contribute to a livelihood. Within the broader context of livelihood security, people are concerned about food and non-food needs and their life's aspirations (Maxwell, 1991). The principle of "food first" therefore does not necessarily apply, partly explaining why households, contrary to expectations, would sell food and subject themselves to the risk of running out of food for their subsistence needs. This was the thrust of many discussions during the study. Besides food consumption, other concerns constantly raised were education and health needs. Mothers, for example, reported that between hunger and health care for their children, the latter would undoubtedly take precedence.

2.3.2 Effects of commercialisation on food security

Studies on the commercialisation of agriculture and its impact on food security have been inconclusive. Between 1961 and 1985, 60 countries whose non-food production increased also showed an increase in per capita supply in basic food, while 23 countries showed a decrease in per capita food supply (Islam, 1994). Islam (ibid.) argued that the

relative rates of growth in food and non-food production were not the dominant factors determining the overall supply of food. Rather, that food supply in countries faced with inadequate production depended on access to food imports, which are subject to the instability of international prices.

A number of studies commissioned by the International Food Policy Research Institute (IFPRI) found that commercialisation generally had a positive income effect on calorie consumption although to varying degrees (Kennedy & Cogill, 1987; Von Braun, de Haen & Blanken, 1991; Von Braun, Johm & Puetz, 1994). Cash crop production in developing countries was often accompanied by an expansion in staple food production (on a per-unit-of-land basis) and per capita food production was often maintained or even increased. This response was attributed to market and production risks (Von Braun, 1994). Even while responding to incentives and trying to allocate their resources efficiently, households' food concerns seem to remain paramount. For example, participants in a sugar cane scheme in Kenya used more of their land in growing subsistence crops, mainly maize, compared with non-participants. Von Braun argued that the negative impact of commercialisation on food security could be where market failures or intra-household imbalances existed, or where farmers were displaced without compensation as governments enforced the growing of cash crops.

However, cognisance is taken of the fact that areas where some of these studies were done were part of production schemes or under project conditions. Government market interventions, therefore, had a major impact on the outcome of many variables, e.g. factor and input use, profitability, and decision making. In Rwanda, a study was done in an area where Government was promoting tea production in an effort to diversify export earnings away from coffee (Von Braun et al., 1991). In Kenya, a study was done in an area where sugar-cane growing was promoted by Government as a strategy to improve the general health and well-being of low-income farm households (Kennedy & Cogill, 1987). In the Gambia, a study was done in a project to promote technological change. Rice production technology was to be upgraded with the introduction of a large-scale irrigation project. A special attempt was to be made to maintain the traditional user rights of female farmers to rice land (Von Braun, Johm & Puetz, 1994).

Under similar conditions in a study in Kenya, Strasberg et al. (1999) suggested that commercialisation improves food crop productivity in various ways.

- It provides a source of cash that allows the household to overcome credit-related constraints to purchasing inputs.
- The creation of positive spillover effects on food production from improved access to production inputs distributed to farmers growing the cash crops.
- Cash income from commercialised production patterns facilitated the purchase of draft oxen or traction equipment that could promote food crop production.

The effect of commercialisation on food security can also be indirect through the effects of other factors. A preliminary study examining the effects of cash cropping on food security in Swaziland found that cotton farmers were relatively more food secure; their food output was higher than that of non-cotton farmers and income from cotton enabled them to purchase food. They had better access to extension services and generally, were headed by younger men assumed to be more innovative (Sithole, 1992).

An analysis of cotton and non-cotton farmers in Mozambique found that underlying an apparent positive correlation between cash crop production and calorie availability was land availability. The area of land under production was found to be more important in determining calorie availability. For both cotton and non-cotton farmers using 0.45 to 2.33 ha of land, calorie availability was higher than the FAO requirement of 2,500 per adult equivalent, on average. While both cotton and non-cotton farmers in the lowest land area quartile were nutritionally at risk, the cotton farmers were more vulnerable (Marrule, Mugabe, Santos, Varela, Tschirley, Weber, Finan & Langworthy, 1992).

The above discussion underscores the difficulty of making generalisations about the effects of commercialisation on food security. Strasberg et al. (1999) posit that the effects of commercialisation depend on a number of factors. These include organisation of a scheme, access to inputs, market outlets, price levels and price risks. They found that the degree of commercialisation differed within and across zones. It was not uniformly associated with land holding or area cultivated and had a positive impact on food crop fertiliser use and productivity. The effects of different cash crops differed by region independent of the effects of commercialisation.

2.4 OTHER FACTORS RELATED TO FOOD INSECURITY IN THE SUB-SAHARAN AFRICA REGION

Despite the emphasis on commercialisation and food security, it is noteworthy that food security issues are often a result of a complex interaction of various factors besides commercialisation. They include the policies that have been adopted, the vagaries of nature, political instability and poverty. In this section, a brief review of food insecurity across the region, highlights this.

In categorising the food insecure in Africa, Maxwell (1992) identified five main categories, similarly identified as vulnerable groups by FAO (1999). All of these categories characterise poverty.

- i) Families that are poor in assets and productive resources, but live in surplus agricultural areas
- ii) The resource-poor and those living in drought-prone or other marginal areas
- iii) Poor pastoralists
- iv) The urban poor
- iv) Refugees, displaced persons and others affected by war.

Poverty steadily erodes the quality of life and waters down efforts put into nurturing economic growth. Agriculture, because of its central role in the livelihoods of the majority in the region, remains pivotal in any poverty alleviation measures. Its increased productivity should contribute towards meeting domestic food needs or to increase foreign exchange earnings to allow for food importation. Despite its role, agriculture and its related industries has often been neglected by African governments. For example, the policies adopted suppressed agriculture or were at the expense of support to the smallholder farmers who dominate the agricultural sector. Relatively low investments have been made in agricultural research that was inherently biased towards the non-food cash crops at the expense of food crops (Eicher, 1990; Eicher & Staatz, 1985). In so doing, economic systems that generate sufficient real income for the poor have not been developed. Coupled with the declining terms of international trade against primary commodities and the increasing costs of industrial and petroleum imports, insecurity and

political instability and rapid population growth, this has had long term effects on food security in SSA (Eicher and Staatz, 1985).

2.4.1 Climatic failures

Given that much of the agriculture is in rain fed production systems, climatic failures especially drought, have a direct bearing on production, income levels and food availability. Because of low productivity marginal areas are often home to the poorer segments of the population and poverty only aggravates the negative effects of the climate. Drought conditions for example led to widespread famine in the mid 1980's, particularly affecting countries in the horn of Africa; Somalia, Ethiopia, and Djibouti, Sudan, parts of Kenya and Uganda (Maxwell, 1991; Teklu, Von Braun & Zaki, 1991; Webb, Von Braun & Yohannes, 1992). Under drought conditions, it has been shown that the poor were even more vulnerable to the impact of famine. In Ethiopia, results from several survey locations revealed that relatively more wealthy households (the top third of households with an average annual income of US\$ 100 per capita), were better able to cope than the poor (the bottom third of households with an annual income of US\$ 42 per capita). Consumption decreased to less than one meal a day in 63% of the poorest households compared with 43% of the wealthier group. In 1985, the wealthier households on average achieved a higher drought year cereal yield, 300 kg per hectare or 38 kg per capita, while the poorer households had 111 kg or a paltry 9.5 kg per capita (Webb et al., 1992).

2.4.2 Political instability

Political instability/war conditions in the SSA region have devastated large areas of land often rendering them unproductive, disrupted economic activity and displaced people from their land and ultimately creating refugee populations. Many examples abound. Output in Somalia has suffered the effects of long-term civil war coupled with little rainfall. In an area of the country known for its sorghum production, it is estimated that output in 1999 was only 20% of the pre-war levels achieved in the 1980's. In Angola, renewed fighting in December 1998 meant that the favourable weather conditions were wasted. In contrast, West Africa's food prospects were reportedly good, largely because

of “lack” of war coupled with the favourable weather (US. Department of Agriculture, 1999).

In Mozambique, two-thirds of the population live in the countryside and about 75% of them depend on agriculture for their livelihood. Following a protracted war situation it is estimated that 63% of the population is undernourished and food availability has fallen below 1,800 calories per person per day (FAO, 1999). Because of the war, many people were forced to abandon the very land off which they live (46% of respondents in a study by Tschirley & Weber, 1994).

2.4.3 Structural imbalances

Structural imbalances are pronounced where large-scale farming replaced indigenous populations who were often displaced to marginal land. Large tracts of land were, for example, set aside for settlers in Zambia, Zimbabwe and South Africa in the Southern Africa region and Kenya in East Africa (Jayne, Takavarasha & Van Zyl, 1994; Kherallah, Delgado, Gabre-Madhin, Minot & Johnson, 2000). Because of low productivity, the displaced populations were deprived of production as a means to a livelihood and entitlement, often having to resort to the market for both. They were thus rendered vulnerable to market failures.

In South Africa, it was estimated that the area under commercial agriculture (predominantly owned by “white” farmers) is about five times more than that of the small farmer (predominantly “black”) agriculture. It was also estimated that food insecurity was predominantly a problem amongst the “black” population, i.e. 86.7% of about 2.3 million people, many of whom rely on the market for their food and potentially need nutritional assistance (Van Zyl & Kirsten, 1992).

In Zimbabwe, about 5,000 commercial farmers occupied about one third of the land in areas with the most reliable rainfall and good soils. In contrast, more than one million families in the communal areas where rainfall is inadequate and the soils are of low quality, controlled 40% of the land. Changes in land use reduced the number of large commercial farms by about 30% in the 1980’s. It also influenced changes in cropping patterns with the commercial farmers shifting away from maize to industrial crop

production. The loss in food production from this shift was critical for national food security and those who relied on the market for their food, e.g. drought prone areas where child stunting is reported to have increased during the 1980's (Shapouri et al., 1992).

2.4.4 Stabilisation and structural adjustment interventions

To address their economic imbalances, many countries in the region have had to undertake reforms within the context of the market based, stabilisation and structural adjustment programmes. Economic stabilisation measures that are generally demand management strategies, notably devaluation and inflation management, were introduced to redress the macro-policy environment. Structural adjustments entailing policy and institutional reforms, were to redress the non-optimal use of resources, increase economic efficiency, expand growth potential and increase resilience to shock (World Bank, 1991).

Recently, food insecurity in for example Zambia, Malawi and Uganda has partly been alluded to be because of these economic reform measures (Chilowa, 1998; COOPIBO-Uganda, 1996; Kherallah et al., 2000; Seshamani, 1998). Structural adjustment reforms within the food sub-sector were primarily to provide the incentives to expand marketed surpluses through price instruments. Food security is at the tertiary impact level, affected by marketing effects such as price transmission, market integration, size of price margins, price stability or through the broader impact on production levels (Kherallah et al., 2000). The evidence as to whether people are more food insecure because of the economic reforms is so far inconclusive. Cognisance is taken of the difficulty of matching specific policies to specific effects. For example, it is difficult to isolate the effects of reform on food security from those of other factors such as political instability and climatic failures concurrently affecting these economies (Chilowa, 1998; Maxwell, 1991; Opio, 1996; Semogerere, 1995).

A common concern, for example, is that incremental production of tradables attracts resources away from locally traded and consumed subsistence crops, creating food shortages. In Zambia, small-scale farmers switched to cultivating drought resistant crops, away from those like maize, which had been accorded an artificial comparative advantage when market controls were in place. Aggregate production of maize therefore

declined. While a switch to drought resistant grains like millet and sorghum would contribute to ensuring food security, a switch towards cultivating cotton is expected to compromise food security as more people would have to rely on the market for food.

On the other hand in Zambia, there are situations indicating that the food security situation of those people previously disadvantaged by the marketing structure, improved. The reforms brought about benefits to the producers and consumers by increasing competition in the purchasing and processing of grain. Large-scale millers lost their monopolistic market shares to small-scale hammer millers and as a result, the marketing costs fell and a wider range of mealie meal products could be offered to consumers. The marketing restrictions had created a circuitous flow of grain; from the rural areas, grain was moved to the urban areas to be milled at specified processors and then back to grain deficit consumers in the rural areas. Consequently, the final product was highly priced (Seshamani, 1998).

In Malawi too, the impact of liberalisation created losers and winners. Generally, there was a positive supply response to the better prices but not enough to ensure national self-sufficiency. Food deficits increased in turn encouraging the sale of many subsistence crops. However, the food security of rural households, characteristically deficit producers, was more precarious following the reforms because of the high and unpredictable maize prices. Households that were characteristically net food sellers should have benefitted from the higher prices. However, they often have not because of the tendency for private traders to offer lower prices than the official prices. Their income therefore did not necessarily improve (Chilowa, 1998).

With specific regard to women, empirical findings indicate that structural adjustment programmes in general have had negative effects on rural women (FAO, 1998a). Although no conclusions can be drawn from this, because of women's role in ensuring food security, a negative effect is assumed.

Reforms in the food marketing system in particular aimed to improve the performance of the small holder sector through increased producer prices. Considering that some segments of the small holder sector are net food buyers, higher food prices should however, reduce their real income and thus negate their ability to access food. In general,

it can be surmised that where the population is further impoverished by these reform programs, their food security status would be compromised (Maxwell, 1991). On the other hand, to the extent that the disincentives to increase productivity are addressed, food security should be enhanced. The effects will depend on the pre-reform production strategies and policy environment and the reform process itself.

2.5 THE IMPLICATIONS FOR FOOD SECURITY

More than 50% of the population of SSA depend on agriculture, which contributes about 35% to the region's GDP and about 40% of total export earnings (United States Department of Agriculture, 1999). Between 1980 and 1990 the overall growth-rate in the agricultural sector has shown a decline from 1.9% to 1.5% between 1990 and 1995. On the other hand, the population growth rate is estimated at 2.33%, more than double that in other regions. If there is any region where the Malthus predictions may be proven, it is here. Between 1994 and 1996, it is estimated that 39% of the population in SSA were undernourished, an increment of about 14 million people from the 1990-92 estimates (FAO, 1999b).

As evident in Table 2.3, between 1990-1992 compared with 1969-1971, the world had an estimated 80 million fewer undernourished people. However, it is estimated that in SSA, the number of food insecure people doubled from about 103 million to 215 million, that is from about 38% to 43% of a growing population (Pinstrup-Andersen & Pandya-Lorch, 1997). West Africa, despite having the largest sub-regional population, has the lowest figures of undernourished people and has recently shown the most marked improvement in the region. In comparison, East Africa with a smaller population has twice as many undernourished (FAO, 1999).

Per capita food production in the mid-1990's was less than it was at the beginning of the 1960's when many of these countries were gaining independence. Between 1992 and 1994, of the 42 countries in the world that were unable to meet the minimum needs (on average 2,200 calories per person per day) 29 of them were in Africa. This was despite an improvement in the world food situation with aggregate world food output able to feed every human being sufficiently (Pinstrup-Andersen & Pandya-Lorch, 1997). Current projections show a further widening of the gap between food production and food needs.

Table 2. 3: Chronic Under-nutrition in the developing World: 1969 -1971, 1990-1992, 1994-1996

Population Variable	No. of Chronically Under Nourished people (millions)			Share of a Region's Population (percentage)			Share of Total Under Nourished Population (percentage)	
	1969-1971	1990-1992	1994-1996	1969-1971	1990-1992	1994-1996	1969-1971	1994-1996
Region								
East Asia	475	268	258	41	16	15	52	31
South Asia	238	255	254	33	22	21	26	31
Sub-Saharan Africa	103	215	210	38	43	39	11	25
Latin America/ Carribean	53	64	63	19	15	13	6	8
Middle East & North Africa	48	37	42	27	12	12	5	5
All Developing Countries	917	839	828	35	21	19	100	100

Source: Extracted from FAO, 1996; FAO, 1998b; Pinstруп-Andersen & Pandya-Lorch, 1997.

Food aid which has played a significant role in SSA (United States Department of Agriculture, 1999) is on the decline both in absolute terms and in relation to total food imports. Estimated at 8.1 million tons (about 50% of total food imports) in the early 1980's, it was estimated at 2 million tons (13% of food imports) in 1998.

It is projected that by 2009, 60% of the region's population will be food insecure, an increment from the estimated 54% consuming less than their nutritional requirements in 1999 (United States Department of Agriculture, 1999). This analysis does not take into account the ravaging HIV/AIDS pandemic, most prevalent among the economically active segments of the population and bound to affect production levels negatively. The implication is twofold, food is increasingly going to be a traded commodity and the market will increasingly become the source of food for many who, with the levels of poverty, stand to be priced out of the competition for food (Pinstруп-Andersen & Pandya-Lorch, 1997).

2.6 CHAPTER SUMMARY

The chapter starts by defining the concepts of food security and commercialisation within the development process in general and within the confines of this study in particular. The different levels and complex nature of food insecurity and therefore the need for a combined approach in its analysis is highlighted. The working definition of food security is in terms of food availability, an estimate of food consumed based on the quantities of

food produced, sold, stored and bought. Food security is however, not just about calorie availability, rather close links exist between food security, nutrition and health. Nonetheless, despite its shortcomings calories are the measure of consumption applied in the study.

The working definition of commercialisation is in terms of the proportion of aggregate farm output sold to aggregate production, standardised by the respective caloric equivalents. Although the definition of commercialisation is often circumstantial, it nonetheless plays an important role in the development process, contributing to the transition out of subsistence economies. It also allows the expansion of the consumption boundary beyond what a household produces and therefore has the potential of contributing positively to food security.

That food insecurity is often a result of an interaction of many factors that include natural phenomena such as climatic failures, political instability, structural imbalances that denied segments of the population of a means to a livelihood and economic reform measures, they are briefly reviewed. The implication for food security and commercialisation are then highlighted, emphasising the need for more attention and planning around the forecast that food sales are likely to increase.

The remarkable economic growth attained in Uganda following the reforms in the late 1980s and early 1990s is explained in part by the very low levels of capitalisation in which most of the population had sunk. These low levels served as the springboard for the growth programme (World Bank Research Centre & Action Aid Uganda, 1997; UALU, 1998). The rapid development of the food sub-sector in part manifests the expansion in demand for consumer goods and cannot be looked at in isolation of other socio-economic developments in the economy. To place the food security case in context, this chapter reviews how developments in the economy at large affect the farming sector particularly the supply and demand for food. In so doing, the conditions that have guided the model specification later in the chapter are briefly discussed. It reviews the socio-economic developments before reform and the implications for domestic demand and supply. It then reviews socio-economic