Chapter 4
Factors Affecting Food Security

This Chapter examines factors that affect food security at both household and other levels of analysis. For the household, the pivotal role belongs to food entitlements, and food insecurity may be proximately understood in terms of entitlement failures. At the national level, food insecurity may be analysed in terms of production, supply and demand deficits. But a fundamental understanding requires an examination not only of its proximate basis but also of its ultimate causal factors. To this end, we take the national "food chain" as the organizing principle around which the causal factors will be analyzed. The role of the agricultural sector, which is quite crucial to both availability (via food production and supplies) and access (determining entitlements of the non-agricultural population via food prices, and of the agricultural population via both incomes and prices) can be itself analysed as an integral part of the food chain. International trade and aid also have significant roles to play in the causal process. For each of these factors, moreover, government policy plays a vital role as well. Finally, the role of the political and institutional environment will also be examined, not only as the conditioning context of the other factors governing food security but also as a factor in its own right.

4.1 The Food Chain and Food Entitlements

As discussed in Chapter 1, there are three aspects to food security at both national, and, more particularly, household levels: availability of food, access to food and stability of food supply. These elements will be examined now both as regards their determinants and how they might become sources of vulnerability of particular population groups.

Initially, this will be approached through examining the characteristics and elements of the food chain and household food entitlements. The food chain is a term to describe the various transformations a food commodity goes through from the point at which seed is planted by the farmer to the last stage when it is acquired by the final consumer. This can be a simple chain, as when grain is grown by the farmer, threshed and milled within the farm household and then cooked and eaten by the family, or very complicated, as when wheat is imported from a major grain exporter such as the USA, milled into flour domestically, sold to a commercial bakery company and then distributed through a supermarket chain. In all cases, the nature of the food chain, the number of stages of processing and transportation through which the commodity passes, the level of efficiency and technical sophistication and capital intensity of the processing, and the degree of competition at different stages of the food chain, all are important in determining the availability of the commodity, in physical terms of amount and geographical distribution, and in economic terms of the price level.
Figure 4.1
RICE COMMODITY CHAIN
Thailand
4.1.1 The Role of the Food Chain

Figure 4.1 shows the commodity chain for rice in Thailand. This major staple in Thailand can be grown under different technical conditions by small or large farmers. After harvesting, it is sold on to traders, who transport it to the mills. From the mills, some part goes to the noodle industry, the rice bran goes to the animal feed industry and the rest is sold either as white rice or broken rice. Then some is exported and the rest remains for human consumption. The availability for human consumption is the outcome of a number of different factors: the profitability of rice production as opposed to other crops, which may not be food crops; the price realised on the export market as compared to the domestic price; taxes and subsidies imposed by central and/or regional government; and the ability of the food chain to produce a reasonable return on labour and capital involved in the different stages of the process.

We all are dependent on a number of different commodity chains of varying lengths, according to the complexity of our diet and the extent to which we consume food which is locally grown or sourced from other regions and countries. This determines food availability. For access to the food we need, we also require income or resources which can be used to exchange for the food, in other words, we need a food entitlement. For many households, their food entitlement results directly from the food chain. Thus they are doubly dependent on the food chain, for both access and availability. In developed countries, the number of people dependent on the food chain for their livelihood has decreased very dramatically over the past decades. In poorer countries, the size of the population who earn their living directly from the food chain can be very large.

In a formal sense, the agents who make up the food chain, producers, transporters, processors, wholesalers, retailers, consumers, etc., are linked by a series of physical and financial flows. Farmers produce raw materials which then flow downstream to assemblers etc., and eventually to consumers, either in the domestic market or in export markets. Physical flows can be shown in a supply utilisation account. Table 4.1 shows how this would look for the first few rows of the commodity chain shown in Figure 4.1.

This table could be extended to cover all stages in the commodity chain, and would account for the movement of every single unit of rice in the system.

Corresponding financial flows take place upstream, from final consumer all the way through to primary producer. These financial and physical flows determine the distribution of income in the chain, and the overall wealth created by the activities of the chain, in terms of value added to the economy as a whole. At each stage, the following identity holds:

\[
\text{Revenues} = \text{Cost of purchased inputs} + \text{Value added}
\]

In turn, value added can be divided as follows:

\[
\text{Value added} = \text{Return to factors} + \text{Taxes/subsidies} + \text{Profits/losses}
\]
Table 4.1 Supply Utilisation Account

<table>
<thead>
<tr>
<th></th>
<th>Supply (t)</th>
<th></th>
<th>Utilisation (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Small farmers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harvest</td>
<td>5598.4</td>
<td>Seed</td>
<td>168.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waste</td>
<td>168.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Village traders</td>
<td>2015.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Local traders</td>
<td>2127.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Co-operative traders</td>
<td>1119.7</td>
</tr>
<tr>
<td><strong>Large farmers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harvest</td>
<td>14163.9</td>
<td>Seed</td>
<td>424.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waste</td>
<td>424.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Village traders</td>
<td>2832.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Local traders</td>
<td>9489.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Co-operative traders</td>
<td>991.5</td>
</tr>
<tr>
<td><strong>Village traders</strong></td>
<td></td>
<td>Local traders</td>
<td>969.6</td>
</tr>
<tr>
<td>Small farmers</td>
<td>2015.0</td>
<td>Private millers</td>
<td>3830.1</td>
</tr>
<tr>
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<td>2832.8</td>
<td>Waste</td>
<td>48.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Local traders</strong></td>
<td></td>
<td>Private millers</td>
<td>12461.0</td>
</tr>
<tr>
<td>Small farmers</td>
<td>2127.4</td>
<td>Waste</td>
<td>125.9</td>
</tr>
<tr>
<td>Large farmers</td>
<td>9489.8</td>
<td></td>
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</tr>
<tr>
<td>Local traders</td>
<td>969.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Co-operative traders</strong></td>
<td></td>
<td>Co-operative millers</td>
<td>2090.0</td>
</tr>
<tr>
<td>Small farmers</td>
<td>1119.7</td>
<td>Waste</td>
<td>21.2</td>
</tr>
<tr>
<td>Large farmers</td>
<td>991.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thus value added shows the income or entitlement accruing to wage labour, owners of capital and entrepreneurs, at different stages in the food chain, plus the net amount available to government to fund its various programmes and policies.

Commodity chain analysis is a useful tool to show how entitlements arise out of the operation of the food chain, and how changing prices, in particular changing world prices, affect flows within the chain, and thus income and entitlements. It is one way of developing a framework for analysing both availability of food and access to that food.

### 4.1.2 Food Production and Food Entitlements

Domestic food production is the most important quantitative component in national food security for almost all countries (barring city states such as Singapore and Hong Kong). Domestic food production, particularly of staples in non-pastoral societies, as well as comprising much of the food available in the country, also forms the basis of food entitlement for much of the farming community, in terms of direct consumption of production. The surplus is sold on through the commodity chain to provide additional
income for the farming community, which in turn pays for agricultural labour. The marketed surplus becomes available for distribution to non-farming members of rural communities and the urban population. As with other stages in the food chain, the food production sector gives rise to a physical flow of food and receives financial flows ultimately from consumers. What determines the size of these flows?

The physical level of food production is determined, at the national level, by factors such as area planted to food crops, soil fertility and climate, technology available and use of inputs such as high quality seed, fertiliser, labour and mechanical equipment. Some of these factors are outside the control of individual or government e.g., climate. Others are to some extent under the control of individual farmers, but the farmer's decision is made in response to the structure of price and non-price incentives he or she faces, which are, in turn, determined by government policy decisions.

Financial profit, as determined by the financial flows moving upstream in the food chain, can play an important part in the farmer's decision as to what commodities to plant, whether to plant food crops or non-food export crops. It is not the only factor, however. Farmers, like most people, are sensitive to risks, both physical and economic. Given the varying climatic conditions in their country, some crops are more variable in yield and susceptible to drought or flooding than others and will be less attractive. In economic terms, some crops may face fluctuating prices on world markets, or may face a higher probability of government intervention in domestic markets. When this is the case, farmers may retreat into producing primarily for subsistence, thus reducing their dependence on the market, but also the flow of food commodities onto the market.

The decision to plant a food commodity is not made in isolation, but in relation to the returns to be made from planting other food or non-food crops. Government can influence this by maintaining the price of food commodities relative to other crops. Attempts to boost food production should not be based solely on raising the price of food crops, however. A proper analysis has to be undertaken as to the knock-on effects of doing this, in terms of labour and input availability.

The impact of prices is, nonetheless, crucial. A study in Thailand, using a technique called the Policy Analysis Matrix (PAM), examined the relative profitability of rice and soybean in a number of different regions of the country (Yao, 1995.). The Thai government had been putting resources such as subsidised credit and increased extension into encouraging diversification from rice into soybean. However, the PAM analysis showed that soybean would not give the farmer a profit in many regions, and that from the government's point of view, there would be an efficiency loss from moving into soybean. Government intervention to encourage or discourage food production has to be based on careful and regionally specific analysis of the various costs and benefits, both to the farmer and to the economy as a whole.

When analyzing the food system of a country, and how national and household food security has developed over time, it is important to remember that food production is not just a component of food availability, but that the process of food production provides the basis for economic access to food, not just for farmers, but also for farm labour, who are dependent on this process for their income.
4.1.3 The Marketing Function

Marketing systems have three broad functions: a logistical function; an informational function and a distributional function. These are critical in determining how well the overall commodity chain operates, and in particular for food commodities, how effectively the marketing system contributes towards maintaining food security.

The logistical function can, itself, be subdivided into three aspects: transformation over space, transformation over time and processing. Transformation over space is another way of saying that marketing systems transport food from point A where the food is in surplus, and as a result the price of the food commodity is low, to point B where the food commodity is scarce and the price relatively high. In the absence of inter-spatial arbitrage, surplus production areas will experience both lower prices, and possibly greater price variation between the pre-harvest and post-harvest periods than will be experienced in deficit areas. State marketing institutions can also be responsible for transporting food from A to B. In this case, often the transportation is simply a result of planning decisions, rather than in response to price movements. Private sector commodity transport is usually triggered by changes in price signals. Generally, this is the basis on which food moves from food surplus rural areas to urban areas or food deficit rural areas. A difference between international food prices and expected domestic prices is also the basis on which private sector importers make the decision to import food from abroad. In surplus years, price differentials between domestic and international prices may also encourage private sector export, which in turn should lead to an increase in the economic return to farmers and earning of foreign currency for the national economy.

Transformation over time, or storing a commodity on both an intra-annual and inter-annual basis, is the second logistic function. In most countries, harvesting of a specific crop takes place over a relatively short period, but the commodity is consumed throughout the year. Farmers can store the crop on farm and release it slowly into the market. However, often they need the money they get from the sale of the crop to pay off debts incurred in the production process. They will sell the harvest to a trader, who in turn may sell it on to a wholesaler who has storage facilities and can release the commodity gradually onto the market. When farmers sell most of their harvest in the immediate post-harvest period, the market price falls in response to the temporary surplus. A trader who has the capital to buy up stocks in the post-harvest period is profits by the use of his or her capital and storage facilities by being able to sell the commodity at a profit when the market is tighter. In the same way, traders can store from one year to the next. However, this has a larger speculative element as it is difficult always to predict what will happen in the next year's harvest. As a result, for food grains, inter-annual storage is often carried out primarily by government. For certain food commodities, such as fruit and vegetables, it may be very expensive to store for more than a few weeks, and these commodities are traded primarily on a seasonal basis.

Processing is the third logistic function which a marketing system undertakes. This can cover anything from the milling of grain to the canning of fruits and vegetables. Processing can be a very major part of the value of the final product, as it is in many
Western countries, for example for pre-prepared meals, or it can be negligible, as with many fresh fruits.

Organisations involved in the logistics side of marketing can perform any or all of these logistical functions. In addition, they can provide finance for trade and also for upstream production. The diversity of organisational form can be immense, even within a single region. As countries become more developed, the importance of the marketing stages of the food chain increases. Processing moves outside the home and becomes larger scale. In general terms, the higher a country’s income, the more important processing is as part of the value added of the food sector. It can also be an important employer. In Malaysia, after two decades of high growth, food processing now employs over 15% of all industrial workers. Similar patterns have developed in other South East Asian economies. Although the percentage of the population deriving their food entitlements directly from agricultural production may be declining over time, the numbers indirectly dependent on agricultural production for employment will tend to increase.

As for all stages in the food chain, each organisation involved in processing has to generate positive financial value added on a year to year basis, to pay the wages of those involved, to give a normal return to any capital committed to the marketing function and to give profits to the owner of the enterprise. The efficiency of the various enterprises, and the degree of competition with respect to the various functions in the marketing process, and at the producer and consumer level, will determine the number of enterprises involved in processing, transport etc., and the distribution of income from their activities.

On the information side, markets are the channel for the price signals which harmonise supply and demand. If they do not function properly then information may not reach the appropriate agents. If traders do not know that prices in one region are rising because maize, say, is scarce, then they will not transport maize to sell on the markets in that region, and regional food security will be endangered. If farmers do not know that the price of maize is rising nationally, because traders are managing to secure all the increase in consumer prices for themselves, as increased profit, then they will not plant more grain to meet the rising demand. In some countries where state institutions regulate the market and undertake most of the functions of the marketing system, these price changes may not be observed. The marketing agency has then to develop some other type of information, such as increases in the size of customer queues, or in unsold stocks of grain, to give them information about the relative demand and supply of the commodity.

Finally, markets and the prices that arise from their operation are the basis for the distribution of the benefits from production and exchange as between producer, trader, processor and consumer. This distributional role is one of the main reasons governments become involved in marketing systems. The state may try to protect the consumer's economic access to food by regulating the price of food at various points in the marketing system. However, if this discourages private traders from operating in certain markets, for example in remote areas, food commodities may not be available at all, unless the state undertakes to provide them.
In summary, an effective marketing system is an important institution in terms of ensuring availability of food in different regions of a country, at different times of the year, and with the degree of processing that the customer requires. It also should provide the information to ensure that there is some stability of supply on a year to year basis. Finally, it is important in ensuring economic access to the population, both in terms of providing income for certain groups of the population and in terms of the level of the final consumer price.

Although input markets did not appear explicitly in the example of a commodity chain shown in Figure 4.1, these are also important in terms of providing appropriate quantities and varieties of seed, fertiliser and pesticides at the relevant time of year to enable farmers to respond to the price signals that the marketing system sends them. The prices at which the marketing system can supply inputs to farmers (and other agents such as processors and transporters, who also use non-food purchased inputs in their activities) will determine the use and productivity of the various productive processes.

4.1.4 Household Food Entitlement and the Food Chain

For simplicity's sake, actors in the commodity chain are often referred to as producers, traders, consumers, etc., as though they only had one function. In fact, all individual actors are consumers (though organisations such as transnational corporations are not consumers per se, their employees are), and many consume on the basis of what could be referred to as multiple entitlements. For example, a farm household may have a production-based entitlement, from the food it produces itself. This could be in the form of millet and maize. Some of the millet could be sold for brewing to provide income, and hence a trade-based entitlement, used to purchase meat and vegetables. One member of the family could work on a neighbouring farm, and another could engage in small-scale food trading, resulting in own-labour entitlements, part of which could be used to purchase more grain. All these entitlements result directly from food commodity chains, and could be supplemented further by entitlements, such as remittances from extended family members working in urban areas, which are not an output of the food system.

As Table 4.2 shows, in all major regions of the world, the population is becoming more urbanised. Only in Europe is the rural population actually declining, but in South America the rural population is static. Equally, in all regions, the agricultural population is growing at a slower rate than the rural population, and in Europe and South America, the rural population is declining. This means that, in relative terms, fewer people are growing their own food, and are increasingly dependent on some kind of commodity chain for their food security. More and more people in rural areas earn their living outside of agriculture, so the marketing system is required to distribute an increasing amount of food not just from rural areas to the towns and cities, but also to distribute commodities within rural areas. In some countries, more and more the marketing system has to move imported food from the ports or land points of entry into the countryside.
Commodity chains and marketing systems become more developed and more complex as economies become richer. Production and distribution systems become more specialised, consumer demand becomes more differentiated and more demands are put on the integrating functions of the marketing system. This can lead to the rather simplistic assumption that, in a monetised market economy, the rich are more integrated into and dependent on the market, whereas poorer, less secure households continue their day-to-day existence isolated from and marginal to the market system.

Table 4.2 1993 Population and Rate of Population Growth, 1961-1993

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Population (m.)</th>
<th>Urban Population (m.)</th>
<th>Rural Population (m.)</th>
<th>Agricultural Sector Population (m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>702</td>
<td>235</td>
<td>467</td>
<td>413</td>
</tr>
<tr>
<td>(2.8)</td>
<td>(4.7)</td>
<td>(2.2)</td>
<td>(2.0)</td>
<td></td>
</tr>
<tr>
<td>America, North &amp; Central</td>
<td>442</td>
<td>320</td>
<td>127</td>
<td>55</td>
</tr>
<tr>
<td>(1.5)</td>
<td>(1.8)</td>
<td>(0.7)</td>
<td>(0.1)</td>
<td></td>
</tr>
<tr>
<td>America, South</td>
<td>310</td>
<td>238</td>
<td>71</td>
<td>68</td>
</tr>
<tr>
<td>(2.3)</td>
<td>(3.5)</td>
<td>(0.0)</td>
<td>(-0.1)</td>
<td></td>
</tr>
<tr>
<td>Asia</td>
<td>3,292</td>
<td>1,083</td>
<td>2,210</td>
<td>1,834</td>
</tr>
<tr>
<td>(2.1)</td>
<td>(3.5)</td>
<td>(1.6)</td>
<td>(1.2)</td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>505</td>
<td>376</td>
<td>129</td>
<td>38</td>
</tr>
<tr>
<td>(0.5)</td>
<td>(1.0)</td>
<td>(-0.7)</td>
<td>(-3.3)</td>
<td></td>
</tr>
<tr>
<td>Oceania</td>
<td>28</td>
<td>20</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>(1.7)</td>
<td>(1.8)</td>
<td>(1.4)</td>
<td>(0.5)</td>
<td></td>
</tr>
</tbody>
</table>

Source: FAO, Agrostat.

In fact, in many countries the evidence indicates the very opposite. Even in rural areas, poorer households tend to be more dependent, in relative terms, on markets, in particular food markets, than rich households. A study in Kenya showed that smallholders buy at least 50% of their food from the market (quoted in Ateng, in Gittinger, 1983). All income groups bought at least one third of their food from the market, and this rose to over 60% in the lowest income group. The larger the size of smallholding, the greater the proportion of food that was provided by own production. This is not always the case. In very poor countries, such as Malawi, surveys have shown that the poorest rural households live outside the market economy and depend on social exchange and barter to meet their food needs, especially in poor harvest years. This is because of their total lack of purchasing power and assets, in a context where markets, in particular labour markets, are poorly articulated. However, this is the exception rather than the norm.
The stereotype of the small peasant subsistence farmer who is virtually self-sufficient no longer applies, if it ever did, to most poor rural households. This subsistence farmer was assumed to have control over his environment, with the exception of the climate, and could, by careful storage, protect himself against all but the worst of droughts. In reality most small farmers face the risks of changing market prices for food, labour and production inputs. Food is not the only commodity which has become increasingly monetised. Land markets have developed in many countries, and credit is much more widespread. All these developments increase the risk a farmer faces e.g., the indebted can lose their land to their lenders and become landless labourers. However, these changes also offer opportunities for spreading risk, by growing multiple commodities, employing some family labour outside of the farm and giving access to improved seed and inputs. For many rural households, where population pressure has reduced the amount of land available for farming, there is no option but to employ a multiple livelihood strategy. In rural areas, that is likely to involve family members at different stages in the food chain; producing, labouring on other farms, milling, trading and processing.

The development of complex food chains undoubtedly improves national food security in an economy, as it increases the integration between different regions, and, if the commodity chain is efficient, should allow for a lower cost food supply as regions specialise in the commodities where they have a productive advantage. This does increase regional interdependence, and can lead to shortages in times of stress in poorer regions where there is less effective demand to pull in food when prices rise in the rest of the country. Equally for individual households who are fully integrated into the market economy, if the food chain operates well, then it offers the possibility of improved economic opportunities and greater food security. However, as will be discussed in section 4, when markets, for whatever reason, come under pressure, then poor households will tend to be at a disadvantage compared to those with greater buying power, or exchange entitlements.

### 4.1.5 The Dynamics of the Food Chain

The presentation of the food chain and its marketing functions so far has been rather static in nature. However, the food chain does more than just provide price information and short term access to and availability of food. The prices arising from the operation of the chain affect resource allocation in the longer term. Thus the articulation of the food chain and its efficiency at signalling information provides the dynamic of the agricultural system in terms of its contribution to economic growth. Prices signal comparative advantage which leads to specialisation in production. Specialisation and the resulting commercialisation induce intensification in production. Intensification in turn leads to economies of scale in commodity production which reduces costs and, depending on relative market power, will result in some combination of reduced prices for consumers, increased returns to factors of production and increased prices. This again increases comparative advantage and the virtuous circle continues.
Over time, increased specialisation, technical change and changing world prices will all affect the allocation of resources both within the agriculture sector and as between agriculture and other sectors of the economy. This will, in turn, change the relative importance of production based entitlements and trade based entitlements in the economy, and will change the focus of policy relating to food security, as development and growth occurs, away from a heavy emphasis on food production as a major vehicle for improving food security towards a broader approach, including food processing, other agro-industrial activities and ultimately all forms of employment-enhancing economic growth.

The links between the agricultural sector and other sectors in the economy are important in this context and are often underestimated. Recently, attempts have been made to quantify the importance of output in the agricultural sector for income, and therefore livelihood, in the non-agricultural sectors of the economy. In Kenya, it has been estimated that an increase in agricultural output of 10% will generate an additional increase in non-agricultural income of almost 5%. This arises primarily from increased output in trading and processing enterprises. These results are another way of illustrating the importance of food and agricultural commodity chains in the level of economic activity in many developing countries.

4.1.6 Seasonal Variations in the Operation of the Food Chain

The importance of different elements of the food chain will vary from season to season, as the production cycle varies. Food cultivation itself is a very seasonal activity, with differing labour requirements at different times of the year. Ground clearance, planting, weeding and harvesting all make different demands on the farm household and leave varying amounts of family labour available for off-farm activity, which might or might not be food-related.

Marketing too can be seasonal. Some food commodities are difficult to store and will only be available for short periods of time after the harvest. Others are available all year round, because they can be stored fairly readily. Depending on the grain, storage may be more appropriate in a milled or unmilled state. For grains which are stored unmilled, then milling will be a regular activity throughout the year. If the grain is normally stored in the milled form, milling will be concentrated in the post-harvest period.

Flows of grain can vary throughout the year, both in quantity and even in direction. In Indonesia, a combination of lower storage costs in urban areas, plus flows of imported grain, which come in through large urban ports can result in the situation shown in Figure 4.2.

In the immediate post-harvest period, a, rice is flowing from the rural areas to the urban area, and the urban price is higher than the rural price, by the amount of the marketing margin. Prices are beginning their seasonal rise. At time b, when the rice price equals p, imports of rice become competitive with domestic rice in the urban areas, and rice stops flowing from the rural areas into the urban areas. However, rural prices continue to rise, until, at time c, they start to exceed urban prices. When rural prices exceed urban prices
by the rural-urban marketing margin, then imported rice starts to flow from urban areas to rural areas. As rice starts to come in from the next season's harvest, at time f, rural prices start to fall until at time g, the harvest is fully in, prices have reached their seasonal low and the process starts again.

The same phenomenon could result if the government operated a buffer-stock policy, releasing rice onto the urban market at price p.

The price changes involved in these switches in direction of grain flows will affect the food entitlements of different groups of the population in different ways. Those who earn their income outside of the food chain will only be affected by the food price rises, but those who are actively involved in trading may find that, at certain times of the season, their income goes down, as rice no longer flows from rural to urban areas. Rice is usually imported milled, and this may reduce income earning opportunities for food processors and millers at certain times of the year. Seasonal variations in food security are not simply linked to seasonality in production, but to the changes in quantities flowing through different links in the food chain, and the resulting opportunities to earn income.

Figure 4.2 Seasonal Rural-Urban Price Differentials

Supply instability is a main cause of temporary food insecurity. This may be a result of acute production shortfalls due to unfavourable weather conditions, or may be characteristic of inter- and intra-seasonal variations in food supply, and they may
critically affect the country as a whole, certain areas or specific population groups (e.g. people living in remote or drought prone areas.)

4.2.1 Stabilising Food Supplies

Some of the measures that serve to raise food production and supply will also have positive effects in terms of stabilising food supplies. This is particularly true of measures aimed at improving rural infrastructure, research, storage and food marketing such as:

• irrigation which will reduce susceptibility to rainfall variations
• research into drought/pest resistant varieties
• investments in storage on farm, local, regional and national levels
• technical improvements to reduce storage losses
• construction and maintenance of rural roads
• improvements in marketing to promote transfers from surplus to deficit areas.

Food pricing and storage policies play a particularly prominent role in attempts to reduce supply instabilities. This area of policy is politically sensitive as it can be seen to contradict the major objectives of structural adjustment programmes in various respects:

• Price stabilisation can undermine the objective of market price liberalisation,
• Government market interventions related to price stabilisation and stockpiling run counter to the objective of reducing the role of government in the economy,
• Marketing and storage operations for food security purposes incur additional cost which can seldom be recovered, leading to increased budgetary expenditures.

Nonetheless, a strong case has been made by a number of analysts that market instability discourages private sector investment in agriculture, and hence slows potential growth in the sector. In most developing countries, farmers cannot insure against crop failure, or hedge on futures markets against price fluctuations. Governments can offset the risks faced by farmers by stabilising markets.

4.2.2 Price Stabilisation

Price instability is a major indicator of supply instability, and price stabilisation is a widely applied strategy to stabilise food supplies. Two main approaches to achieving price stability can be distinguished:

1) The direct approach, by setting official market prices, e.g. by a pan-seasonal pricing system or, more commonly, by a system of price guarantees with floor and ceiling prices;

2) The indirect approach, by stabilising prices through public sector market interventions.
The second approach allows greater flexibility. Nevertheless, both policy approaches operate according to the same basic principle which is:

- the government purchases (usually through a parastatal marketing agency) food on the market and builds up food stocks when market supplies are abundant and the prices tend to fall below a fixed or desired level.

- the government releases food onto the market (from stocks or imports) when supplies are limited and prices tend to rise above a fixed or desired level.

Figure 4.3 shows the stylistic pattern of such a system with typical seasonal price variations and floor and ceiling prices (if the price were absolutely fixed as in the case of a pan-seasonal pricing regime, floor and ceiling prices would coincide, i.e. be the same).

**Fig. 4.3: Floor and ceiling prices and ideal price movements**

In order to be effective in achieving its price stabilisation objectives, a system as described above requires a number of preconditions to be fulfilled:

1) An adequate institutional and physical market infrastructure which allows:
   a) purchases to be effected, and buffer-stocks to be built-up in periods of abundant supplies, when prices tend to drop below the floor price
   b) and the availability of buffer-stocks to be released, and/or food (aid) imports to be channelled into the market, when the market prices reach the ceiling level.

2) An effective system of floor and ceiling prices requires the setting of a realistic price band, i.e. a price-range which runs between the upper and lower ends of potentially fluctuating market prices, as demonstrated in Figure 4.4.
If prices were set outside the bands indicated, the system would imply either ineffective prices, or a highly distorted prices that is unsustainable in the long-run.

- If the floor price were set too high, stocks would accumulate over the years without being sold.
- If the floor price were set too low it would be ineffective, as no purchases could be made and no stocks could be built-up to draw on later when required.
- If the ceiling price were set too high, it would be ineffective, as no sales from the stocks could be made.
- If the ceiling price were set too low, it would be difficult to maintain as the amount of stocks needed to stabilise the price would be rapidly exhausted (if not compensated with cheap food imports).

**Figure 4.4** (In-)appropriate and (in-)effective price ranges for floor & ceiling prices

3) A third precondition is sufficient funds for the purchasing and stocking operation. Funds are required to cover the additional costs accruing from:

- the necessary stand-by arrangements, in order to be able to intervene when necessary
- financing of the purchasing/sales operations, when interventions become necessary
- interest rates for credits /opportunity costs of capital invested in the stocks
- management and technical storage costs
- storage losses.

Although, in principle, the marketing margin should cover storage costs, experience shows that this is difficult to achieve, particularly in the case of buffer-stocks and food reserves established for market regulatory and food security purposes (see also Box 4.1).

To be effective, price stabilisation policies need to comply with all the conditions set out above. If not, intervention may worsen price instability and food insecurity than otherwise as producers and consumers end up bearing added marketing and price risks.
In an open economy and in the presence of marked fluctuations of food prices on the world market, the use of variable levies on imports could serve as an instrument to achieve partial price stability on the internal food market.

**Box 4.1: Market-stability interventions and food security**

Stockpiling to achieve food security was generally found to be a costly activity. It is not possible to pursue stocking policies, which require an increased involvement of the public sector in the buying and selling of grain, without increasing the budget (both foreign exchange and domestic currency) of the agency which would implement those policies. The required funds increase with the degree of food security achieved. It is seldom possible for any agency to make a profit from market-stabilisation intervention while meeting food security goals, unless resources, such as food aid, are received at below market costs.

Higher stock levels become more effective in reducing extreme consumption shortfalls of vulnerable groups when combined with explicit price triggers for their accumulation and release. This price-band regime is effective because it corresponds more closely to the nature of food-security goals of the government and food agency managers. When price bounds are reached, stocks are quickly released or acquired to maintain consumption and prices within desired limits. While market extremes are to be avoided, variability within set limits is not seen as problematic.

Greater public sector involvement in the market affects the profitability of the private sector. This effect is disproportionately higher than the improvement in food security achieved. (...)  


### 4.2.3 Stocking Policies

Since the time of ancient Egypt, public holding of food stocks has been considered an essential element of the food security strategy of a country. Different types of public food stocks can be distinguished, according to the main purposes and features of stockpiling:

**Table 4.3: Types and purpose of public food stocks**

<table>
<thead>
<tr>
<th>Type of stock</th>
<th>Purposes</th>
<th>Important features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working stock</td>
<td>Smoothing regular intra-seasonal / intra-annual supply variations, in order to ensure continuous market supplies and/or to stabilise prices</td>
<td>Short-term intra-seasonal and/or intra-annual stocks established by public food marketing enterprises</td>
</tr>
<tr>
<td>Buffer stock</td>
<td>Offsetting irregular/unexpected variations in market supplies, price stabilisation</td>
<td>Inter-seasonal / inter-annual stocks built-up or drawn down, depending on the market situation</td>
</tr>
<tr>
<td>Emergency food reserve/food security stock</td>
<td>Ensuring food requirements are met in cases of natural or man-made disasters, to bridge the period until food (aid) supplies arrive from external sources</td>
<td>Inter-annual stocks, provisions for unpredictable emergencies, stocks released for emergency relief purposes</td>
</tr>
</tbody>
</table>
The preceding discussion has already revealed the close linkages which exist between price stabilisation and stocking policies: building-up of food stocks means increased market demand and has the effect of stabilising prices from falling below desired levels in times of abundant supplies, while a release of food stocks means increased market supplies and prevents prices from rising exorbitantly when market supplies are scarce. There are two exceptions to this general rule:

1) if stocks are built-up with food imports, there is no additional market demand and no price effect on the domestic market when stocks are built-up, and

2) if stocks are released via free food distribution to the poor, the volume of market supplies and the market prices will not be affected to the full extent of the stock release.

In the latter case there may be indirect effects if the beneficiaries of free food rations reduce their market demand, or if they sell part of the free rations on the market. (Such phenomena are related to the issue of targeted assistance being addressed further below.)

In establishing targets for the size of public food stocks, a compromise has to be found between the objective of maximising supply stability and food security, and minimising costs and budgetary burdens. The costs of public stockholdings are quite substantial and are seldom covered by the marketing margins, as indicated above.

In defining optimal stocking levels for public food reserves, a number of different factors have to be taken into consideration, such as:

- **Production and supply risks**, depending, for example, on the drought proneness of a country, prevalent production systems (e.g. rain-fed or irrigated), civil disorder, etc.
- **External supply routes** for food imports: countries with easy access to external markets will have lower storage requirements than, for example, land-locked countries, countries with insufficient port facilities, or areas which are cut off from external markets for geographical, political or economic reasons.
- The quality of the **internal transport infrastructure** determines the effectiveness and efficiency of internal transfers between (potential) surplus and deficit regions.
- **Private stocks** held, for example, by farmers, traders or households, and the interrelationship between private and public stockpiling practices. Private stocks will reduce the need for public security reserves. The interaction between private and public stocking practices depends largely on:
  - **Marketing system**: the role of public and private agencies in food marketing, pricing and marketing policies pursued by the government, and marketing efficiency.
  - **Vulnerable groups**, their characteristics, size, and location, their food needs and the emergency-relief requirements complementary to other sources of food supply,
  - The effectiveness of **early warning systems**: if effective, early provisions can be made for internal transfers and imports which will reduce total stocking requirements.

Given the wide range of factors, it is clear that no simple mechanistic formula can be applied in determining stocking requirements, and that the level of stocks needed is influenced by other policies, such as infrastructure, trade, marketing, and pricing policies.
Box 5.2: Assessing the food security reserve requirements for Ethiopia

In the case of food emergencies, the food security reserve has the role of bridging the period until food imports (commercial and/or concessional) arrive. The food from the reserve shall be distributed as relief assistance to the population affected by food shortages. A probabilistic approach is applied to assess stock levels at a given risk of stock run-out of 5 per cent, meaning that in one out of twenty years the food stocks will be insufficient to meet the requirements. Higher risk levels would lead to a reduction, lower risk levels to an increase in stock requirements. In calculating the level of FSR, the marketable internal production and the food requirements up to arrival of imports are taken into consideration.

The determinants of the level of the food security reserve requirements are:

- cereal production by region,
- population by region,
- cereal consumption requirements by region,
- auto-consumption of cereals as share of total consumption by region,
- expected inter-regional transfers of grain during the import delivery period, and
- the delivery period of food imports.

In the model statistical data on production, population and marketed surplus are used. In addition, the following assumptions are made:

- Delivery period of imports: alternative periods of 3 to 6 months between identification of the food needs and actual deliveries are considered. Past experiences have shown that commercial food imports require about 3 to 4 months to arrive from the time an order is placed, while food aid imports normally require at least 4 months from the time the need is assessed and a request is made.
- Average per capita cereal consumption requirements: 123 kg p.a.
- Inter-regional transfers between surplus and deficit regions within the country contribute to cover the deficits. Alternative percentages are applied, depending on the time lapse from the emergence of deficits. It is assumed that 33% of marketed regional surpluses can be transferred to deficit regions within 3 to 4 months, 50% within 5 months and 66% within 6 months.
- In addition to the food security reserve, there exists a food buffer stock of 100,000 MT, established for market and price regulatory purposes and managed by a parastatal marketing agency. Without the buffer stock, the requirements for the food security reserve would be 100,000 MT greater.

The results of the model calculation are presented in the table below. The figures show the volume of food security stocks needed to secure supplies until food imports arrive, assuming different scenarios of delivery periods.

<table>
<thead>
<tr>
<th>Delivery period for food imports</th>
<th>Inter-regional transfers</th>
<th>Risk of stock out</th>
<th>Food security reserve stock level1)</th>
<th>Storage costs p.a.2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 months</td>
<td>33 %</td>
<td>5 %</td>
<td>51,290 MT</td>
<td>18</td>
</tr>
<tr>
<td>4 months</td>
<td>33 %</td>
<td>5 %</td>
<td>212,950 MT</td>
<td>75</td>
</tr>
<tr>
<td>5 months</td>
<td>50 %</td>
<td>5 %</td>
<td>343,010 MT</td>
<td>120</td>
</tr>
<tr>
<td>6 months</td>
<td>66 %</td>
<td>5 %</td>
<td>505,640 MT</td>
<td>177</td>
</tr>
</tbody>
</table>

1) In addition to a food buffer stock of 100,000 MT
2) Only variable storage costs of 350 ETB/MT p.a. are considered, value of stock not included. ETB stands for the local currency Ethiopian Birr, exchange rate (in 1993) 5 ETB = 1 US-

Source: GTZ, Management and Effects of Food Aid Interventions in Ethiopia, Eschborn 1993
In determining optimum stocks, the costs and efficacy of public stocks in achieving stability and food security have to be compared with alternative approaches, e.g. commercial and/or aid imports. A combined strategy with minimum stocking targets, sufficient to cover the period until imports arrive, may often be the most appropriate approach. Box 4.2 illustrates how to calculate the size of a food security reserve.

### 4.2.4 Price Policy Instruments

The major pricing policy instruments and their principal effects are listed in Table 4.4:

<table>
<thead>
<tr>
<th>Policy type</th>
<th>Major instrument</th>
<th>Principal economic effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade policies</td>
<td>subsidy/tax on imports/exports</td>
<td>prices of traded goods change; indirect effect on potential tradables</td>
</tr>
<tr>
<td></td>
<td>import/export quota</td>
<td>indirect effect on prices of tradables</td>
</tr>
<tr>
<td>Exchange rate policies</td>
<td>nominal exchange rate</td>
<td>prices of traded goods change; may lead to pressures on prices of non-tradables, e.g. labour</td>
</tr>
<tr>
<td>Market system policies</td>
<td>subsidies/taxes</td>
<td>prices of affected goods change</td>
</tr>
<tr>
<td></td>
<td>administered prices</td>
<td>rationing; black-market transactions; or budgetary costs</td>
</tr>
<tr>
<td>Production input policies</td>
<td>minimum wage; land tax; interest rate or other import subsidies</td>
<td>changes allocation of domestic resources; affect labour/capital mix of production</td>
</tr>
</tbody>
</table>

Adapted from FAO, 1991, Economic analysis of agricultural policies, Training materials for agricultural planning No. 30

Instruments relating to trade and exchange rate policies have been briefly discussed earlier. The policies which belong to the category of **administered prices** deserve special mention. These are:

1) pan-territorial pricing,
2) pan-seasonal pricing,
3) floor and ceiling prices.

1) Pan-territorial pricing:

In order to achieve geographical integration of remote areas and/or to increase overall food supplies by encouraging food production in remote and low potential areas (see the list of agricultural sector objectives above), the governments of many countries have established a system of nation-wide equal producer prices. This approach implies two
specific problems (apart from the general problems associated with regulated prices; rigidities and market imbalances) that hamper overall efficiency of the food production and marketing system:

- production of the price-regulated crops expands in areas which are, due to natural or economic reasons, not necessarily suitable for their production (possibly at the cost of crops in which the areas have comparative advantages),
- additional, sometimes excessive, haulage costs from remote production areas to the areas of consumption.

As a result, either the consumers are charged higher prices than they would have to pay in the absence of a pan-territorial pricing regime (with adverse effects on their real income), or the government has to compensate (through subsidies or by covering the losses of marketing agencies) the additional costs involved. The latter means additional fiscal expenditures, contradicting the efforts to reduce budgetary deficits.

2) Pan-seasonal pricing:

Another commonly applied pricing regime consists in keeping the prices of food crops unchanged throughout the season or year. This is intended to give the producers a reliable basis for calculation, and/or to ensure that the consumers are provided with food at stable prices.

Without government intervention, food prices would normally move according to the following pattern (see also Figure 4.5): dropping from a pre-harvest peak to the lowest level during harvest or shortly after harvest, then rising gradually afterwards until they reach a new peak level just before the next harvesting season, before they drop again.

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**Fig. 4.5: Floor and ceiling prices and hypothetical price movements**

![Diagram showing floor and ceiling prices and hypothetical price movements](image)

There are three main factors responsible for this "normal" price movement:
the changing supply and demand situation during the course of the year (abundant supplies and low market demand after harvest, scarce supplies and increased market demand later in the year),

- the capital, technical and management costs involved in food storage.

- risks of economic and physical losses involved in food storage.

Apart from the general dilemmas of administered prices already indicated, there are some specific problems involved in pan-seasonal pricing which likely affect overall efficiency of the food marketing system:

- There is no incentive for farmers or traders to store food over time, resulting in

- high pressure on a (generally limited institutional and physical) marketing infrastructure to absorb all marketed crops during the procurement campaign, a relatively short period after harvest,

- high financial requirements for crop purchases during this procurement campaign or else delayed payments to the farmers,

- need for large bulk storage facilities,

- substantial amounts of capital being invested and 'parked' in stocks,

- storage costs, to be borne by the government,

- risk of large carry-over stocks in times of repeated good harvests.

The efficiency problems and budgetary burdens associated with pan-seasonal pricing are the main reasons for discarding such pricing regimes under structural adjustment programmes.

3) Floor and ceiling prices:

Instead of keeping price absolutely fixed, the government of many (including western industrial) countries have applied a system of price guarantees on the basis of floor and/or ceiling prices. Here, the government is (only) obliged to intervene in the market if the price of the product concerned tends to drop below the guaranteed floor price (minimum price guarantee for the producers), and/or if, in the case of rising prices, the market price reaches the upper price limit defined (maximum price guarantee for food processors and consumers). This pricing system represents an intermediate approach between price fixing and liberal price formation, with the advantages of a greater flexibility as compared to a fixed price system on the one side, and a greater (price) stability than a free market system on the other side. However, there are also some special problems involved in such an approach, as, for example, the experiences in Mali reveal (see Box 4.3). In order to be effective, a price guarantee system with floor and ceiling prices requires:

1. An institutional and physical marketing infrastructure which allows:
· purchases to be made, and
· buffer-stocks to be built-up

in periods of abundant supplies, when prices tend to drop below the floor price, and the availability of:

· buffer-stocks to be released, and/or
· food (aid) imports to be channelled into the market,

when the market prices reach the ceiling.

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**Box 4.3: Food Marketing and Pricing Policy Reforms in Mali**

The objectives of the cereal market reform in Mali are to stimulate production of cereals, increase the efficiency of the cereal marketing system in order to provide consumers with cereals at stable and at lower price possible while eliminating the deficits of the grain board. The reform which was to be implemented over a five-year period was supported by a number of donors. By 1984, the marketing of coarse grains had been liberalized and the private sector has been handling the marketing of rice since 1986. Because the price of grains in Mali has been maintained at artificially low levels in urban areas for years, the reform made provision for gradually raising consumer prices by using food aid as a buffer, while increasing and supporting prices to producers. Although the Malian experience has been relatively successful because private traders can buy and sell foodgrains freely or transact with the grain board as they wish, a number of problems remain unresolved. For example, in 1985-86, with the return of normal weather conditions, Mali, like most Sahelian countries, experienced a bumper cereal crop. Pursuing the producer price support policy, the marketing board (OPAM), through its own purchases and those of private traders who deliver grain to it, found itself out of money to continue purchasing grains from producers at the support price. Furthermore, its storage facilities became quickly inadequate. OPAM stopped grain purchases and producer prices fell below the minimum price. On the consumer side, the market price dropped considerably below the OPAM intervention price (i.e., the stabilization price), and the board was left with huge costly unsold stocks. From: FAO, Food security policy issues in West Africa, op.cit.

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2. A second precondition is a realistic determination of the price limits, i.e. a price-range which runs in between the upper and lower ends of potentially fluctuating market prices (as shown in Figure 4.9), otherwise the system would imply a severely distorted price structure (with well know consequences) and would probably not be sustainable in the long-run. If the prices were set too high, stocks would accumulate over the years, if they were set too low, no purchases could be made (except under enforced procurement, as applied in various countries in the past, for example in Ethiopia during the Mengistu-regime) and no stocks could be built up to draw-on when required.

3. A third precondition is the availability of funds to effect purchases or imports when required.

Additional costs accrue from:

· the stand-by arrangements required in order to be able to intervene when necessary,
· the marketing operations, when interventions become necessary, and
· the necessary storage activities.

Although, in principle, the marketing margin should cover the storage costs, experience shows that this is rarely the case as far as buffer-stocks held for market regulatory purposes are concerned. The buffer stock issue which is closely related to a system of floor and ceiling prices, will be discussed in greater detail in the following chapter.

Price guarantees can play a useful role in stabilising producer and consumer prices only as long as the government is capable implementing the policy. When (as experiences show, see the Mali case in Box 4.3) this is not the case, the outcome may be worse than without government intervention. Erratic and unforeseen price fluctuations resulting from the government's inability to maintain a guaranteed price level imply a substantial risk for all parties concerned; the farmers, the traders, and the consumers. Private traders will be discouraged from becoming committed to food marketing and from making any substantial investment in this field, apart from, perhaps, speculating on windfall profits.

4.3 The Role of Trade

Much of the discussion above has been in the context primarily of the domestic economy. Yet most countries are involved in the importation and export of food commodities. Indeed, over a third of Africa's cereal consumption is from imported grain. This means that, in the same way that households and regions become interdependent when they become integrated into the domestic food chain, so countries become more interdependent with one another when they specialise in order to benefit from international trade.

4.3.1 Historical Trends

Historically, international food markets were quite slow to develop. The cost of transportation and the difficulty of preserving many foods meant that there was little international trade in foods prior to the middle of the nineteenth century. Before then, trade was concentrated on high value cash crops which were difficult to grow in temperate climates. Spices had been traded since the middle ages. By the early 1800s, sugar was being grown in the West Indies for export and the slaves working in the sugar plantations were being fed on imported foods such as wheatflour and salt fish.

By the late nineteenth century, certain patterns in the flows of international trade were becoming established, which still linger on today. The colonising powers of Western Europe were developing markets for their industrial exports in third world countries, which were paid for through the export of cash crops such as coffee, tea, rubber and
Many of the Western European countries had reduced their tariffs on imported grain, following the lead of Britain, who had repealed the Corn Laws in 1846, to enable cheap imports of grain from North America and later Australia. Thus at the turn of the century, Europe was exporting primarily industrial goods to pay for imports of grain and livestock from the New World and cash crops from Africa and Asia. This pattern was to change during the Depression of the 1920s and 1930s as all the developed countries became more protectionist, and the USA became more industrialised and reduced its imports of manufactures from Europe. Overall trade levels fell dramatically, and many of the colonies were badly affected by plummeting world prices. This period marks the institution of marketing boards in countries like South Africa and the then Rhodesia, to support farmers who were badly hit by the world recession.

Since World War II, exports of cash crops are still the major source of foreign exchange for many developing countries, but many African countries are now importing food crops direct from Europe and the USA, as well as manufactured goods. Some Asian countries now export manufactured goods as well as cash crops and import food crops. North America is responsible for about 80% of cereal exports. Cereals make up about 40% in value of the developing countries' total food imports, a change from the 1930s when all the major developing regions, Africa, Asia and Latin America, were self-sufficient in cereals.

Cereal imports have grown to all continents, except Europe, in the last three decades. The average annual rate of growth of cereal imports in the world as a whole was 3.8%, roughly the same as for total food imports. The extent to which cereals are traded across international borders varies by category. Overall, about 12% of cereal production was traded in 1993. However, this varied from 4% for rice, through 13% for maize to a high of 22% for wheat. For comparison, 99% of coffee production was traded in 1993.

The nineteenth century patterns, of Europe and North America exporting commodities which are consumed domestically, and developing countries exporting commodities for which there is a minuscule home market, still holds with relatively few exceptions, and those mainly among the fast developing countries of East Asia. Developing countries still trade primarily with the developed world, rather than amongst themselves, in spite of the advantages that could arise from greater regional trading in food commodities. It is argued that this kind of specialisation in production, leading to greater integration into world markets, can increase national wealth. In the next sub-section, this argument will be examined.

4.3.2 The Competitiveness of International Markets

The argument for greater integration into world markets has always been based on the classical doctrine of free trade and comparative advantage. This can be summarised as follows: if a nation consumes both commodities A and B, which it can also produce, then concentrating its production on the commodity which it can produce with greater relative efficiency, say A, and trading that for B on the world market, it can increase its overall consumption of A and B combined.
Leaving aside for the moment the question as to whether developed countries produce and trade according to their comparative advantage, it is interesting to examine what determines comparative advantage. Some part of this, in agricultural products in particular, is determined by climate and soil type, but much of it is the result of decades of investment in production methods, research into seed varieties and development of appropriate infrastructure. It has been argued that this has tied some countries into producing agricultural commodities which have poor long-term prospects in slow-growing markets. Might these countries be better advised to stop following 'comparative advantage', decide to try to produce manufactures, initially for the domestic market but with a view to long-term exports, and move away from cash crop production back to food production? In thirty years time, the country could have developed a comparative advantage in manufacturing.

For many developing countries, however, the immediate choice facing them is between increasing their production of cash crops to earn foreign exchange for manufactured imports and probably increased food imports as well, or to encourage increased self-sufficiency in food, possibly through increasing protection to domestic farmers. What has been the nature of the international food markets within which context they have to make the choice?

It would be difficult to describe these markets as free and competitive. Most industrialised countries have been heavily protective of their domestic farmers, particularly those producing food crops. Over the past few decades, there has been slow growth in domestic food markets in developed countries. Low elasticities of demand for basic grains has meant that domestic markets were potentially quite unstable. In addition, farming in the industrialised countries had become a high technology area, with quite low unit profits. As a result, farmers were driven to produce on a larger and larger scale, to earn an adequate return on their capital. Farmers have historically had considerable political influence in many developed countries, and over the past few decades, the major agricultural exporting nations of the West have been trying increasingly inventive ways of providing protection to farmers at as low a cost as possible, including concessional sales of surplus production, set aside schemes and use of sanitary and phytosanitary regulations to protect home markets.

Many of these programmes, which are discussed in more detail in Chapter 6, stabilised the country's domestic food prices, but at the cost of destabilising international market prices, because surplus production was forced into exports, both commercial and concessional. International food prices were also depressed, which was good for consumers in developing countries, but, in many cases had a disincentive effect on producers. Isolated efforts were made to offset this negative impact, notably the EEC-ACP Lome agreements, which provided preferential access to European markets for certain developing countries. However, the underlying factors affecting international food markets were untouched until the Uruguay round of GATT, which was finally signed in December 1993. This was the first GATT round to include trade in agricultural commodities to any extent and is also discussed in Chapter 6.

It could be argued that the degree of protection of international food markets is only marginally relevant to the issue of whether or not to become more closely integrated
Chapter 4 Factors Affecting Food Security

4.3.3 International Specialisation and Food Insecurity

A good case can be made that international specialisation may actually improve food security in a country. It spreads risk and sources of income, so that in the event of a domestic food crop failure, the export earnings from cash crops can be used to pay for food imports. A country which is integrated into international markets will also have developed good transport infrastructure which will allow easier access to imported commodities. Countries which have little outside trade often have high transport costs, which indicates long delivery lead times, congested ports and low-volume carrying capacity. These are not consistent with food security in times of crisis when fast imports may be necessary. Insofar as greater external trade implies greater national prosperity, then this in turn indicates improved economic access to food.

However, this all assumes that international markets are not inherently more risky than domestic markets. In fact, international prices can be highly unstable yet countries have somehow to decide what strategy they should be following over a period of years. A country cannot switch between export orientation and a self-sufficiency approach from year to year. International prices are difficult to predict, and usually it is difficult to do more than calculate past trends on which to base the decision. Most international commodity markets are outwith the control of any individual country. Past efforts for groups of countries to operate commodity agreements to stabilise prices have been, for the most part, abject failures. Most developing countries end up both buying and selling in unpredictable markets.

Some grain markets are notoriously thin, such as the market for rice. Such a small proportion of world rice production is traded that variations in domestic production, or indeed demand, can result in very high relative movements in international supply and demand. Other markets, such as the wheat market, are rather more robust, but are dominated by a few major suppliers. This can lead to dependence on one supplier, which has caused difficulties when political issues have influenced trading agreements.

The decision to follow an export oriented strategy may benefit a country overall, but there may be significant changes in the distribution of benefits from trade internally within the country. There will be changes in the quantities of food moving through the marketing system, and changes in the direction of flow. Domestic food processors and traders may well be adversely affected. Equally there will be changes in the commodity chain for exports. If export production is concentrated among larger farms and if export processing is carried out by larger companies than are involved in domestic food processing, then national income could rise, but the food security of the poorest could fall. However, export production could also create more employment opportunities for landless labourers and have the opposite effect on household food security.
There is one very important way in which international markets differ from domestic markets. If a national economy becomes heavily monetised and, for some reason, one section of the population suffers a dramatic and sudden failure of entitlements, say because of a localised drought, then there is a national government which can step in and take action to restore some form of food entitlement for that group. If a country suffers some major entitlement failure, for example because of a complete failure of the coffee crop, there is no international institution to step in and restore the country's entitlements. There have been various attempts to provide some form of insurance, such as the EC's STABEX fund, but these are partial and not always reliable.

**QUESTION for Discussion** ARE the issues outlined above, as to why increasing export orientation and international market integration may create problems for a country's food security, sufficient reasons in themselves to justify withdrawal from international markets?

### 4.3.4 Unbalanced International Trade and Globalization

In principle, according to the theory of comparative advantage that is usually cited to demonstrate the benefits of trade, international trade should increase development opportunities and welfare for all participants. Food supplies can be stabilised and increased by food imports, the import of productive resources can help increase domestic food production and supplies, export production generates employment and income for large segments of the population, and the foreign exchange proceeds from exports provide for the capacity of a country to buy on the world market what it needs.

However, some fundamental assumptions of the theory apparently do not apply in practice. International trade is characterised by major imbalances, and the benefits from trade are unequally distributed. Consider:

- Since the end of the Second World War the volume of international trade (exports) has increased from 207 Billion US-$ (1947) to 3,336 Billion US-$ (1991). The increase has mainly been on the account of industrial countries which hold a share of more than 70 percent of the world exports, while the share in world exports of the developing countries (excluding OPEC) amounts to 15 percent.

- Trade among the industrial countries absorbs more than 50 percent of international trade volume, while trade among developing countries (without OPEC) only accounts for about 3 percent of international trade. The main export markets of the developing countries are the industrial countries which absorb about two thirds of their exports.

- The expansion of international trade volume has been accompanied by a change in composition. While the share of manufactured good has increased continuously and amounts to about 75 percent by now, the share of primary commodities (agricultural products, fuel and minerals) has decreased.
Primary products account for more than half of the exports of developing countries but less than 20 percent of the exports of the industrial countries. Many developing countries mainly depend on the export of one or two primary commodities. In essence, the structure of international trade of developing countries is characterised by a dependency on exports of primary commodities to industrial countries on the one side, and on imports of manufactured products from the industrial countries. This structure has a number of unfortunate implications.

The world markets for raw products are largely saturated. Therefore, increased production can only be absorbed at decreasing world market prices. Such tendencies are reinforced by new technologies which are less dependent on raw materials.

Due to limited alternatives of diversification, there is strong competition among the exporters of primary commodities, compounding the tendencies of price decreases.

Exports of primary commodities are, in price and volume, largely dependent on the economic situation in the industrial countries. Highly fluctuating prices and volumes in exports stand against a relatively inflexibly demand for imports of industrial products.

In the production of primary commodities, the scope to compensate price reductions by increased production efficiency is limited and lower than in the case of industrial production. Exports at low world market prices of primary commodities can only be maintained if wages are kept low. This is possible if a high number of un- and under-employed people (a typical feature of many developing countries) exerts a downward pressure on wage levels. Low export prices go hand in hand with low levels of household incomes.

All these factors together are responsible for the unfavourable position of many developing countries in international trade. These are the reasons for their declining share in international trade and the worsening terms of trade (see Box 4.4). During the period 1980 to 1992, the relative prices of non-fuel primary commodities decreased by almost 50 percent in relation to the prices of industrial goods (Commodity Terms of Trade).

Declining Terms of Trade and highly fluctuating export prices and volumes have substantial repercussions for the food security situation of the affected countries and their populations. These factors affect the financial capacity of the countries to import the food they need in order to stabilise and to increase internal market supplies, and they contribute to the low levels of household income. This leads to a widening of market supply/import deficit as well as the demand deficit.

Reasons for the worsening position of many developing countries are not only the "invisible hand of the market" that distributes the gains from international trade according to differences in market power, but also protection policies pursued by industrial as well as developing countries. A wide range of tariff- and non-tariff barriers are imposed on external trade transactions.

Protection contradicts the ideal and the growth and welfare prospects of a free international trade system. This became a major subject of concern for the international
trade negotiations under GATT (General Agreement on Tariffs and Trade) in the Uruguay Round (1993). Although earlier GATT Agreements had already brought about

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**Box 4.4: Terms of Trade**

'Terms of Trade' are a measurement for the change of conditions in international trade. The following Terms of Trade concepts can be distinguished:

1) **Commodity** or **Barter Terms of Trade** that indicate changes in prices of export commodities in relation to the price changes of import commodities. If the prices of exported commodities fall and/or the prices of imported commodities increase, the Terms of Trade decline, and a country has to increase its export volume in order to maintain a certain level of imports (and vice versa). As they are easy to calculate, the Commodity Terms of Trade are the most commonly used indicator of the changing position in international trade.

2) **Income Terms of Trade** measure the total export proceeds of a country (export volume multiplied by export prices) in comparison with the total expenditures for imports (import volume multiplied by export prices). Decreasing Commodity Terms of Trade lead to declining Income Terms of Trade if price changes are not compensated by a corresponding increase in the volume of exports. or a corresponding decrease in the import volume.

3) **Factor Terms of Trade** take, in addition to price changes, differences in productivity into consideration. They answer the question, how much can be imported for a given level of labour or capital input in export production (Single Factor Terms of Trade), or what is the rate of exchange of factor inputs in export production for factor inputs abroad in imported goods. To give an example: A skilled worker in Germany had to spend his wage income of 22 working days in order to buy a Indian carpet which was produced by an Indian carpet knitter in 240 working days (Hetmeier 1991).

Source: M. Metz, Ungleich Bedingungen im Welthandel - Bringt das neue GATT-Abkommen Verbesserungen für die 3. Welt? (Unequal conditions in international trade - Does the new GATT Agreement bring about improvements for the 3rd World?), Zeitschrift für Sozialökonomie, 3.1995

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a substantial reduction of tariff barriers on a world-wide level, certain sectors, such as agriculture and textiles (which are specifically interesting for the economies of developing countries) and the issue of non-tariff barriers had hardly been addressed before. These issues have been included in the last Uruguay Round Agreement, in addition to agreement on further tariff cuts. Another important element in the Agreement is the **differential treatment of developed and developing countries**, giving the latter certain preferences as to the reduction of import duties and a longer period of transition for implementing the policies (see Box 4.5).

What are the implications of the provisions of the Uruguay Round Negotiations for development and food security? Only some tentative observations can be made.

All measures, specifically the tariffication of non-tariff barriers and the further reduction of the tariffs, contributes to greater transparency on international markets and closer linkages between domestic and world market prices. This can enhance economic efficiency and growth on a world-wide scale, with positive implications for food security in the long-run.
Box 4.5: The GATT Uruguay Round Agreement on Agriculture

The implementation of the Agreement on Agriculture starts in 1995, and the commitments of the developed countries to reduce support and export subsidies, to expand market access should be completed within six years, i.e. by the year 2000, whereas the commitments of the developing countries should by completed within ten years, by the year 2004. The least developed countries are not required to make any reductions. The commodity coverage of the Agreement on Agriculture includes most of the products normally considered as part of agriculture (i.e. it excludes fishery and forest products) except that it also excludes rubber, jute, sisal, abaca and coir. The exclusion of certain products from the definition of agriculture does not imply that commitments to improve market access are not to be made. They are covered by negotiations under industrial products. However, domestic support measures for these latter commodities are completely excluded from reduction commitments as there are no such commitments for industrial products. Although the negotiations on tropical products were conducted separately from those on agriculture, in the end they have been grouped together with other agricultural products.


Although the group of developing countries as a whole will probably gain from the liberalisation of agricultural trade, the gains will be relatively small as far as tropical products are concerned and, furthermore, unequally distributed. The poor countries will gain less than the middle income countries. A number of countries that enjoyed preferential treatment in the past (e.g. under the Lomé Convention), and this refers largely to poor and least developed countries in Africa, may even experience losses, due to the decline in their preferential margins.

Another important issue for food security, is the implications of the Agreement for world market prices and the future trade volume in food, specifically in grain. The most likely scenario appears to be a reduction of (surplus) production in a number of developed countries, resulting in a decline in export volumes and increase in world market prices. Internationally available food aid supplies are also likely to decline. This will negatively affect the food security situation of food importing countries, of countries and people depending on food aid supplies, and the stability of grain supplies on a general world-wide scale. On the other hand, it will have a stimulating effect on food production in a number of countries with potential to increase food production and exports.

The most significant gains in export earning of developing countries will probably not come from agricultural trade liberalisation but from a reduction of the restraints on textiles under the Multi-Fibre Arrangement.

In summary, too much should not be expected from the Uruguay Round Agreement for developing countries. The developed countries will gain most from international trade liberalisation. This means, in essence, that the inequities in international trade may be compounded rather than diminished.
Food aid represents the most prominent form of external assistance that, by nature and intention, is specifically designed to enhance food security. In a broad sense, food aid can be understood as a resource transfer in kind of food to beneficiaries at concessional terms, i.e. better terms than available on the market. In its origin, food aid was predominantly an instrument of surplus disposal, largely determined by the situation in surplus producing countries, particularly in North America after the Second World War and, later, also Western Europe.

Major food aid donors are the USA, the European Union (Commission and member states) and the WFP (serving as the major multilateral channel for food aid between donor and recipient countries).

### 4.4.1 Types of Food Aid

Depending on its use, food aid is classified into three main categories:

- Programme, or non-project food aid,
- Relief food aid,
- Project food aid.

This classification of food aid is not always clear, as approaches to food aid utilisation have become more flexible and rather complex. Project or programme food aid may be used for relief purposes, or the counterpart funds generated through monetised programme aid may be allocated to specific projects or for relief purposes.

In general one can state that the food security situation in the countries depending on food aid is severely affected by the reduced food aid deliveries in various respects; to compensate for the decreased food aid commercial imports have to be increased at significantly higher prices, worsening the balance of payment situation and leading to diminished food supplies and higher market prices. Furthermore, less food is available in support of specific vulnerable groups.

**Programme food aid** is not targeted at specific beneficiaries or groups but provided to governments, both as loans or grants. It is usually destined for sale on the local markets, but may also be used to build up food security or food buffer stocks. The main purpose of programme food aid is to provide balance of payments and budgetary support. The "aid component", or the amount of balance of payments support, depends on the conditions under which programme food aid is provided. These conditions vary significantly among donors and recipient countries, and sometimes even between different consignments from the same donor to the same recipient.

Programme food aid is usually monetised, i.e. sold on the local market at prevailing or subsidised market prices. In the latter case, programme food aid constitutes a major resource for targeted (or non-targeted) food subsidy schemes. The budgetary support
component of programme food aid depends mainly on the regulations concerning the use of the sales revenues.

The effectiveness of programme food aid in achieving food security depends on the conditions under which it is provided and on the situation in the recipient country, specifically the type of prevailing food deficits. Programme food aid can play an important role in efforts to stabilise food supplies in countries and situations characterised by large production and supply variations.

**Relief food aid** Relief food aid is provided on a grant basis and distributed to targeted beneficiaries to address critical food needs arising from natural or man-made disasters. It accounted for 26 percent of all 1993 food aid deliveries, and plays a particularly important role in Sub-Saharan Africa which received about two third of the total.

Typically, relief food is distributed to target groups through specifically established channels, with relatively high complementary infrastructural, logistical and managerial requirements. When emergencies arise, the necessary resources for relief assistance must be mobilised and the structures of relief distribution set up immediately, in order to reach the designated population in time. This is always difficult, and particularly hard to achieve if, as often occurs, the afflicted people live in remote and inaccessible areas.

It is in the nature of emergencies that they are mostly unpredictable. Nevertheless, certain provision can be made in order to mitigate the possible disastrous effects once they occur. Such provisions include vulnerability assessment, early warning systems, food security reserves at strategic locations, an institutional framework for effective response on all levels (involving government institutions, foreign and multilateral aid organisations, NGOs), etc.

Relief assistance can be considered as effective, if it is targeted by commodity type, quantity, and time according to need. However, due to the problems involved in sudden and large scale relief operations, targeting is usually only achieved to a certain extent. It is imperative to phase out general food relief as soon as the emergency is over, in order to avoid dependency and distortions of local food production and marketing systems.

**Project food aid** Project food aid is similar to relief aid in that it is provided on a grant basis, in support of specific development objectives and beneficiary groups. Part of project food aid deliveries may also be monetised in order to generate funds to pay the costs of internal distribution of the project organisation, or for complementary financial inputs required in project implementation. The difference between programme and project food aid is, in the latter case, largely reduced to the fact that food aid is not provided directly to the government.

### 4.4.2 The Role of Food Aid Interventions in Alleviating Food Insecurity

Which food aid approach, and whether any form of food aid, represents an appropriate intervention depends, to a large degree, on the nature of existing food deficits and their
causes. The chief types of food deficits are market supply/import deficit and an effective demand deficit.

Figure 4.6 shows the situation of an aggregate food deficit in a country, composed of a market supply/import deficit (B-A) and an aggregate demand deficit (R-B). It applies to an open economy, with p indicating the level of world market prices.

**Figure 4.6: Food deficits and the scope of food aid interventions**

![Figure 4.6: Food deficits and the scope of food aid interventions](image)

**B-A: Market supply/import deficit**: Need for commercial imports or, alternatively (if a country lacks foreign exchange), need/scope for programme food aid to be monetised, to cover the gap between domestic supplies and effective demand.

**R-B: Demand deficit**: Need/scope for project and/or relief food aid for targeted distribution of food to those people who lack the purchasing power to express their food needs as effective demand.

**R-A: Total aggregate (structural) food deficit**: Needs to be covered by imports (commercial imports, programme food to be monetised, and project/relief food aid according to the proportion of the sub-deficits) in order to meet total requirements.

Programme Aid. A market supply/import deficit (B-A) determines the potential scope for programme food aid to the extent that programme food aid deliveries substitute for commercial food imports. Such a substitution is desirable or necessary if a country is short of foreign exchange. Programme food aid has, in this case, the main function of foreign exchange support. As the effective demand for food exceeds domestic production and market supplies, food (aid) imports can be monetised up to the amount of a prevailing deficit, without the risk of market distortions and disincentives on local food production. This, however, only applies under two essential conditions:
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1) The commercial food imports and programme food aid together do not exceed an existing market supply/import deficit. This condition point to the problem of and the need for a careful assessment of the "Usual Marketing Requirements" (UMRs) fixed by donors in food aid agreements with recipient countries. UMRs are set to ensure that a country maintains specified levels of commercial food imports when it receives food aid.

2) Programme food aid being monetised and channelled into the food market is not sold at "dumping prices", hence does not depress the local market prices below "reasonable" price levels. Depending on the situation, reasonable price levels are determined by regional production costs and/or shadow world market prices.

If one, or both, of the above conditions do not apply, programme food aid would likely have adverse effects on the level of domestic food production and supplies. In Figure 6.1, such disincentive effects of food aid deliveries would induce a market price below the level p and a corresponding reduction of the level of local food production below the volume A. As a result, an actual demand deficit would be reduced, but the production and the market supply deficits would increase, with likely negative implications for long-term food security.

Such disincentive effects may also occur if the government of a recipient country is, through abundant food aid supplies, enabled or even encouraged to keep the producer prices for food artificially low, and/or to neglect the agricultural and food sector as a whole (policy disincentive of food aid).

Relief & Project Aid A demand deficit (R-B) results from the fact that people have insufficient food entitlements. Such a situation requires may call for targeted approaches of employment and income generation in favour of the poor and vulnerable groups and/or direct food transfers. These are classical fields of relief and project food aid.

Although relief and project food aid are thought to cover the food deficits of food insecure households, the sale of relief and Food for Work (FFW) rations by the beneficiaries is a common phenomenon. This could be an indication of poor targeting. There are, however, also many other reasons for such behaviour, e.g. immediate cash needs or the need or preference for other types of food commodities, etc. Such factors may cause the recipients of relief and project food aid to sell part of the rations received, in spite of the fact that their household food requirements are not fully met.

4.4.3 Evaluating and Improving the Efficacy of Food Aid Interventions

For an assessment of the efficacy of food aid interventions in enhancing food security, various aspects have to be taken into account. These are in summary:

- The objectives of the food aid interventions: improving food security (mitigating acute food shortages, transitory, chronic food insecurity), foreign exchange support, budgetary support, compatibility of objectives of donors and the recipient country, distinction between short-run and long-term objectives.
· The **type of prevailing food deficits** (production, market supply, and/or demand deficits, latent, transitory or chronic food shortages) to be addressed by the food aid interventions.

· The **agricultural sector and food policy** in the recipient country, and the role of food aid in national food and/or nutrition strategies, if defined.

· The intended and the actual **use of food aid** interventions (relief, project, programme aid, food security reserves).

· In the case of relief and project aid: the extent to which **target groups** are effectively reached and their food and nutrition situation status improved.

· **Disincentive risks** of food aid resulting from distortions of the local food system (prices, markets, production, consumption), caused for example by the effects of formal and informal monetisation or changes of consumption patterns induced by food aid interventions. Distinctions must be made between short-run and long-term effects.

· The **costs** of food aid interventions (comprising procurement costs, international transport costs, internal transport and storage costs, administrative and management costs, leakage, etc.), in comparison with alternative forms of food aid procurement and use (e.g. financial aid to effect commercial imports, conventional supplies versus local purchases or triangular transactions, direct distribution versus subsidies or normal marketing channels).

· Clarification, as to what extent food aid supplies represent **additional resources** (considering all cost components involved in food aid transactions, see above), and to what extent food aid competes for resources with other forms of development assistance.

· Assessment of the **cost-effectiveness** of food aid interventions in achieving food security in comparison, and/or in combination, with other forms of foreign assistance and external resource transfers, i.e. financial and technical assistance.

The effectiveness of food aid in strengthening food security largely depends on the way food aid is utilised by the recipients and provided by the donors. Often there is substantial scope for improvement, specifically concerning the following issues:

On the **recipient country** side:

· Formulation of a national food security programme and integration of food aid within the same;

· Development of national preparedness plans, including early warning systems;

· Development of institutional and physical infrastructure for storage and distribution;

· Priority use of counterpart funds according to food security objectives;

· Commitment of complementary local resources to food aid projects (or, alternatively, integration of food aid components in development projects).
On the donor side:

- Multi-annual country programming of food aid commitments, specifically concerning the provision of programme and project food aid;
- Sensible use of regulations concerning "Usual Marketing Requirements" in food aid agreements with recipient countries.
- Timely and co-ordinated response to food shortages;
- Allocation of funds for local purchases or commercial food imports;
- Promotion of triangular transactions;
- Provision of complementary financial and technical assistance.

Other approaches to external assistance, apart from food aid, and their relevance for food security are discussed in the following sections.

### 4.5 The Political and Institutional Environment

Much of the discussion in this chapter has centred on market relationships, how people use their resources to produce food, and how the overall food supply moves through market channels to become available to those who have income to purchase it. In most countries nowadays, markets are undeniably the dominant institution. Markets, however, do not operate in a vacuum. As recent experience of liberalisation has shown, particularly in the former communist countries of the Eastern bloc, there are a number of underlying institutions necessary for the effective operation of the market system. In addition, specific institutions can also step in where markets just will not come into being. Thus, non-market institutions are fundamental both when markets function (whether poorly or well) and when they do not function at all.

#### 4.5.1 The Institutional Context

The market as an institution concentrates on the process of exchange of rights, rights to property, to labour and to commodities. One of the first requirements for effective market operation is that there should be a system of well defined property rights, plus a system for enforcing them.

Information is also important if markets are to function effectively. Buyers and sellers must be able to identify one another, and have access to information as to the prices at which other agents are transacting. For markets to be competitive, there have to be many buyers and sellers. When markets are only emerging, it can be difficult to avoid domination by a few wealthy and risk-taking agents. Once a few agents have developed a monopoly position in a market, they often have sufficient power to block entry to that market by other agents. Buyers are then forced to pay monopoly prices if they wish to undertake transactions. This is frequently a problem in small localised credit markets.
However, markets are only one type of institution which governs economic activity in a country. Other institutional arrangements can be important in governing economic activity as it relates to food security. (The term institution, or institutional arrangement is used to indicate the various rules and regulations which determine what is acceptable in custom, or legal, the "rules of the game".) Governments may intervene to prevent certain kinds of exchanges, or to enable others, because of some notion of over-riding human rights. For example, in some countries, it is illegal for a household to indenture their children, regardless of how hungry they are. In many developed countries, the state provides certain minimum benefits to the eligible poor because it is felt unacceptable that a wealthy country should not protect its citizens from dying from hunger in the street. Not all activity takes place in response to financial rewards and incentives. In many countries, particularly in rural areas, people join together to undertake activities either which will benefit them all collectively, or because it is seen as culturally or morally important that these activities are undertaken.

Governments are particularly likely to intervene in food markets in various ways, to improve food security for poorer sections of the population. This is often justified in terms of the need to provide a safety net in society or for the sake of common humanity. In many cases it also appears that the popularity and even the legitimacy of the government is based on its ability to deliver stable supplies of cheap food to the population, of the cities in particular.

It is not uncommon for countries to overrule large sections of the food market in times of crisis in national security. During World War II, the British government instituted a system of rationing for almost all the basic food commodities, and made it illegal to trade these commodities outwith the rationing system. This was to ensure equal access of all the population, regardless of wealth, to the limited quantities of food available. For similar reasons, Cuba's population were subject to a food rationing system during the 1970s and 1980s. Up until the late 1970s, most of the Sri Lankan population were entitled to a weekly rice ration.

These are perhaps extreme examples, but many countries have developed less comprehensive programmes which improve the access of the poor to food, whether for moral or political reasons. In some countries this has taken the form of subsidising the basic foodstuff. The price of bread in Egypt was almost constant for a long period in the 1960s and 1970s. In other countries the poor are entitled to participate in specific targeted programmes, such as the food stamp programme in the USA. In yet other countries, the social safety net is not specifically linked to food commodities, but some kind of income support increases the food entitlements of the poor. Any assessment of food security has to include these state institutions in addition to those of the market.

A third type of institution which is often overlooked is that related to collective action. This term includes those activities where members of a community organise themselves to undertake economic activity, or organise the delivery of a service, or manage a communal resource. These can be of particular importance in societies which are not fully integrated into the monetary economy, or where traditional customs are still an important element of daily life. However, collective activity can also play an important role in modern societies. Many voluntary organisations and community based
organisations in Western societies rely on collective action and can play an important role in the provision of services. Indeed, collective action is an important element in the governing of water resources in some districts in southern California.

Collective action is important in many countries in areas of water management and irrigation. Building of dams can be undertaken communally in a very organised way, such as in China, where collective activity was one way to mobilise the large amounts of labour necessary to build large scale dams, but can also be much more informal, as in many semi-arid African countries, where local communities build dams and shallow wells to catch as much water as possible in the short rainy season. Irrigation systems may be collectively managed with local committees to allocate access to water to ensure equity and sustainability in the use of water.

Collective management is also important in the development and use of common property resources, most often common grazing but also fishing rights in lakes, rivers and even local sea-fishing. What many of these systems have in common is the need for careful management so that land does not become degraded or rivers become over-fished. A market solution would be possible, where grazing or fishing rights were sold out to individuals, as happens in countries where grazing rights and fishing rights are individually owned. However, here the property is held communally and either because there are customary rules and regulations for land use, or because it is felt less likely to exclude poorer members of the community, access is based on non-market principles such as individuals having the right to graze so many cattle per year, or catch so many fish per year.

Where communities lack certain services or where it is felt that existing service providers are exploiting a monopoly position, they may form cooperatives to provide these at an affordable price. Although co-operatives often develop an important financial and market element, very often they start out based on non-profit principles with a strong collective input from the community. Many institutions are complex mixtures of market and non-market elements. Often collective activity has a strong element of self-interest, but may represent a way of mobilising resources, in particular labour power, when financial resources are lacking.

There is a final sphere of activity, which some analysts call the moral economy, which is composed of a series of customary rights and obligations which link different groups of the population together, and may be particularly important in times of food stress. For example, in northern Namibia, women and children had the right to go to the kraal of the traditional chief during times of famine, when food had run out. He kept the communal food stores and had an obligation to feed any of his dependent subjects who came to his enclosure. Similar obligations have been noted in other parts of the world. Box 4.6 discusses the various types of relationships which used to be typical in parts of Bengal in India.
It is important to keep these other types of food entitlement in mind when assessing the nature of food security problems in a society. For the most vulnerable, non-market institutions may be critical in determining survival, particularly in times of crisis. They can mitigate the effects of the market on those who have little purchase or labour power. They can also make a considerable difference in the way the benefits from the food chain are distributed. Unfortunately, in many countries emergent markets are reducing the incidence and effectiveness of non-market mechanisms, as societies become more monetised and communal rights are increasingly privatised by the rich and affluent.

Non-market institutions are not just important in the local and national economy, but also in the international sphere. The GATT negotiations discussed in section 2 above are a major example of the recognition of the need for collective action to improve trade regulations. Any individual country may stand to lose by removing trade barriers unilaterally, but if enough countries do this at the same time, then they can, in theory, all benefit. Equally conferences such as those on the law of the sea, and the Rio conference on the environment are acknowledgement of the need for collective institutions to supplement the operation of the market.

### 4.5.2 The Role of the State

In one sense the state has a privileged position in the institutional framework, in the sense that it has the power to change institutions, i.e. the rules of the game. Most countries have some form of constitutional division between the judiciary and the executive, but this is not a perfect division and there is usually some way for the executive to modify the legal structure within which the judiciary operates.

In the 1990s, the power of the nation state is rather more limited than in previous centuries because of the role of international finance. Many countries, particularly in the developing world, rely on access to overseas capital, both private and public sector, to finance their development programmes and their recurrent expenditure requirements. Thus they are constrained to follow policies and develop institutions which make them creditworthy in the eyes of either private capital or foreign aid donors.
There is, at present, very much a consensus that the appropriate role for government is to facilitate the operation of the market economy and encourage the development of the private sector. Thus, instead of the interventionist policies which many states operated in the past, whether their economies were centrally planned or mixed economies, the role of the state is now seen to be much more limited. The state should institute a legal framework which facilitates the exchange of property rights and set up a regulatory framework, such as recognised weights and measures which increases the transparency of exchange.

In addition, where there are clear market failures, such as in the provision of public goods, it may be appropriate for the state to provide these directly, or to finance their provision by appropriate private sector organisations. This is particularly important for the provision of market facilitating infrastructure, such as roads. In agriculture, there is a case for the state to finance research into improved seed and technology, particularly for food crops, where a private firm might have difficulty recovering its costs. The state may also have a role in providing social goods, such as education and health services, though this must not be done in a way which endangers the fiscal probity of the economy.

This more restricted view of the state arises, to some extent, from an acknowledgement that, far from being a benign but fundamentally neutral institution whose main purpose is to further the wellbeing of its citizens, the state is an organisation like any other, with its own objectives and internal incentive structures. The political economy analysis of the last two decades emphasises the tendency for agents of the state to pervert the operation of markets, by investing their time in rent-seeking activities to improve their own welfare at the expense of the efficiency of the economic system as a whole. It is thus seen as important to curb the ability of state employees and decision-makers to undermine productive economic activity, and restore the discipline of the market place.

Thus the prime role of the state is seen as setting up a legal framework which stipulates the rights and obligations of both individuals and the wide range of organisations which operate within an economy, including government ministries and the various public sector bodies which carry out policies and projects on behalf of government.

### 4.5.3 Food Sector Organisations

It is impossible to make a comprehensive list of the wide range of organisations which play a significant role in the food economy. However, the following give some idea of the variety and characteristics of some of the major players.

The **private commercial sector** The significant role of the private commercial sector in the food chain and in achieving food security has become evident throughout the discussion of the food chain. Under adjustment, with market liberalisation and privatisation constituting key elements of most economic reform programmes, its role will be further strengthened. This is true for all stages of the food chain, from production up to the retailing level, specifically to all types of marketing functions involved in the food system, such as:
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- Input supply,
- Procurement,
- Transport,
- Storage (including the management of food buffer and food security stocks),
- Wholesaling,
- Retailing.

Although, in the past, policy interventions in food marketing have often inhibited the private commercial sector from effectively and successfully fulfilling its functions, careful and sequential approaches may be required, in order to ensure that the private sector has a chance to grow into its new and wider role. If market liberalisation and privatisation are introduced in an abrupt and radical manner, there is the risk that the old system breaks down before a new and functioning system is established, with severe implications for food security.

The size and structure of private sector operations can vary from small female dominated village level processing, to the vast scale of operations of transnational companies running vertically integrated operations from plantation production through processing to retail sales, covering a number of countries. All share the need for a stable and predictable economic environment to enable appropriate forward planning.

Co-operatives The basis of most farmer co-operatives is to achieve economies of scale in transport and other services, and to raise the bargaining power of farmers over the price and other conditions of sale of their produce and of farm inputs. This is particularly attractive where markets are poorly developed and farmers have poor and unreliable links with the national market.

Co-operatives are normally run by their members and do not set out to be profit-making organisations. Unfortunately many of them have proved to be loss-making. It may be difficult to find the necessary management skills in rural areas to ensure effective operation. Training needs may be high. In some countries co-operatives have been particularly vulnerable to co-option by the political system. Overall, the co-operative movement has had very mixed fortunes over the last three decades in many developing countries. Where education levels are high and institutional support is well developed, then co-operatives have been successful in improving the economic situation of their members and creating greater security for them. Where institutions are poorly developed and members’ supervisory abilities are weak, then co-operatives have been very susceptible to mismanagement and even corruption.

Parastatals With the changing role of the state, the number of major parastatal organisations has fallen significantly. In the 1960s, many countries had large government-run marketing organisations which were an important arm of government policy. They allowed government to directly influence prices by trading either as monopolies or along side other enterprises. Their objectives varied according to policy. In some cases, the main objective was to stabilise prices. In others, it was to ensure that profits from export crops remained in the country and did not accrue to transnational corporations (though frequently these profits went into government coffers rather than
into the pockets of producers). Economies of scale in marketing were a major justification for setting up these large operations.

As the tide turned against state intervention in markets, so parastatals fell from favour. They were seen as too political in their function, many of them were inefficient and made massive losses and their presence in the market distorted incentives for private sector operation. Over the past decade, considerable attention has been focused on how to privatise the operation of parastatals in such a way as to encourage private sector activities, while protecting consumers and producers from transitory disruptions.

**Local and community organisations** Households are usually embedded in local communities which play a highly important role in ensuring social security of their community members, specifically in rural areas. These local communities provide social security in many respects, including food security. This can occur at various levels from spontaneous actions of neighbourhood support if a family or a member of the community suffers destitution up to different forms of community based social security institutions.

The principal advantage of community structures is their close relation to the community members. The community is best aware of its members suffering destitution and able to respond spontaneously. These capacities can and should be used in implementing targeted policy interventions to improve food security in various ways:

- Identification of the people in need for food assistance,
- Determination of the type and volume of assistance needed,
- Distribution to the beneficiaries (e.g. through community fair price shops, community kitchens, schools, health centres).

Communities can also take an important role in organising agricultural activity, such as the management of local irrigation schemes, the digging of shallow wells and the management of village seed banks. In some countries, community credit schemes are also important. Again, the great advantage of these community operations is the extent to which they can develop to meet local needs. The transactions costs of policing programmes are much lower, because there is greater knowledge of participants. Also it can be possible to mobilise resources at a local level because people see clearly the benefits to themselves if projects go ahead, whereas there is less immediacy with projects organised and operated from the national level.

**Non-governmental organisations (NGOs)** NGOs offer a potential vehicle for supporting or complementing public sector measures in achieving food security objectives. They have an especially important role in countries with weak infrastructure and low administrative capacities. Due to their presence in the field and their decentralised approaches, NGOs may play a particularly effective role in providing targeted assistance to vulnerable groups. This refers, in principle, to international as well as local NGOs, depending on their objectives, experience, and scope of activities.

The important role that NGOs can play in supporting and complementing government efforts to alleviate poverty and to improve food security derives from the following factors: (World Bank, 1990):
• Their ability to reach poor communities and remote areas that have few basic resources or infrastructure and where government services are limited or ineffective;

• Their lobbying function for the poor and underprivileged;

• Their ability to promote local participation in the design and implementation of public programmes by building self-confidence and strengthening the organisational capability among low-income groups;

• Their usually low cost of operation due to using simple low cost technologies, streamlined services and low operational budgets;

• Their innovativeness and adaptability in identifying local needs, building upon existing resources and transferring appropriate technologies developed elsewhere.

In spite of such striking advantages there are, however, also certain limitations of NGO approaches which should be given due consideration when a stronger NGO involvement is envisaged:

• There is a limited replicability of many NGO sponsored activities as they are often small and localised. In attempting to scale up their operations with support from the public sector, some NGOs may lose their innovative quality and may become top-down, non-participatory and dependent on further external government support.

• NGO activities may have a limited self-sustainability as they are often conceived as being primarily relief-oriented rather than developmental.

• Limited managerial and technical capacities of many NGOs;

• Lack of a broad programming strategy for a region or a sector and poor co-ordination of NGOs at different levels;

• Controversial political or religious orientation of some NGOs.

With due attention to these issues, NGO activities should be encouraged and utilised to advantage in programmes aimed at poverty alleviation and improving food security of vulnerable groups. An additional valuable feature of an explicit NGO involvement is their potential to attract (additional) external assistance in support of such programmes.