# CHAPTER ONE

## 1.1. Rationale, Definition and Scope

In modern times the interest in “food security” was reignited following the world food crisis of 1972-74. The crisis originated from a combination of factors, including adverse conditions in several parts of the world, which reduced global grain supplies. Subsequently, a dramatic increase in demand for grain imports doubled international grain prices, which threatened the food security status of food importing nations.

As a result, the first World Food Conference held in 1974 focused on the problem of global production, trade and stocks. Hence, the original food security debate focused on adequate **supply** of food and ensuring stability of these supplies through food reserves. Subsequent food security efforts focused primarily on food production and storage mechanisms to offset fluctuations in global supply and ensure the ability to import food when needed.

However, it became obvious that an adequate supply of food at the national or international level does not in itself guarantee household level food security. For example, the Green Revolution in Asia of the 1960s and 1970s, with its package of improved seeds, farm technology, better irrigation and chemical fertilizers, was highly successful at augmenting food supplies, but this was not automatically translated into improvements in food security of all people. This insight highlighted the problem of a lack of effective demand. From the early 1980’s, the importance of food **access** was increasingly recognized as a key determinant of food security. Hence, food production is just one of several means that people have to acquire the food that they need. Concerns about insufficient food access have resulted in a greater policy focus on incomes and expenditure in achieving food security objectives. This has brought food security closer to the poverty reduction agenda.

**1.2. Goals of Agricultural Policy**

**Policies** are thought of as types of state intervention in the market economy, but there is no single definition of the term. Economists usually think of policies as the goals and methods adopted by governments in order to influence the level of economic variables like prices, household income, national income, the exchange rate and so on. Policy is defined as the course of action chosen by government towards an aspect of the economy, including the goals the government seeks to achieve, and the choice of methods to pursue the goals.

**Agricultural policy** normally refers to a set of laws and regulations that control the business of agriculture. The tangible economic objectives for the agricultural sector of most governments, especially those of developing countries, are **to promote economic efficiency** (and hence higher incomes), to distribute incomes, to provide **food price stability** and **security of food supplies**, to create conditions of adequate nutritional status for all.

**1.3 Concepts of food security**

Throughout the years, the definition of food security has experienced a substantial evolution, moving from a supply-focused concept, mostly related to food availability, to a multidimensional notion that takes also into account food accessibility, food utilization and food stability.

The first definition of food security dates back to the World Food Conference of 1974, as the 1973 world oil crisis and the subsequent increase in world food prices raised awareness in the international community towards their responsibility to fight hunger and malnutrition (Maxwell 1996). The proposed definition reflected a focus on the supply side and more specifically on the assurance of food availability and price stability of basic crops at both national and global level:

‘Availability at all times of adequate world food supplies of basic foodstuffs […] to sustain a steady expansion of food consumption. […] and to offset fluctuations in production and prices’ (United Nations 1975).

In 1981, a study by Sen (1981) addressed the importance of individuals’ and households’ entitlement to food, thus introducing a new dimension to the national and global level of the former food security concept. The author stressed that some people could still be food insecure although there is enough food available in the aggregate. Sen (1981) further showed that food security is a combination of ownership, exchange possibilities and food availability, rather than of food availability as such. On the basis of these observations, in 1983 the FAO elaborated a new definition of food security, built on three pillars: availability, stability and access.

‘The ultimate objective of world food security should be to ensure that all people at all times have both physical and economic access to the basic food they need’ (FAO 1983).

In the 1990s the nutritional aspect of food security gained increasing importance. It was realized that an adequate intake of food does not automatically imply that micronutrient needs – in particular the daily requirements of iron, iodine and vitamin A – are met (DeRose et al. 1998). The recognition that the quality of the diet is as important as the quantity marked the shift in focus from energy deficiency to micronutrients deficiency. Moreover, it was acknowledged that proper access to food has to be combined with nonfood resources such as adequate sanitation, proper health care and access to clean water in order to ensure a healthy and active life (Quisumbing et al. 1995).

These considerations converged in what is considered today the most complete and widely accepted definition of food security, which was elaborated at the World Food Summit in 1996 (Mechlem 2004). Finally, The new definition takes into account both the individual and the global level of food security and recognizes the importance of the nutritional value of the diet. It moreover reaffirms that food security is a multidimensional issue that goes beyond the simple availability of food and requires access to sufficient, safe and nutritious food.

In the 2000s, the 1996 definition of food security was further extended with the concept of ‘social access’ – which reflects the potential importance of exclusion based on social norms, rather than on economic grounds (e.g. if women do not have sufficient bargaining power in the household to ensure satisfaction of their needs, or if some groups are excluded from the use of certain resources based on caste or ethnicity). At the 2009 World Summit on Food Security in Rome the 1996 definition of food security was reaffirmed. The four dimensions of food security were once more recognized and the embodiment of nutritional security in the concept of food security was further emphasized.

 ‘Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. The four pillars of food security are availability, access, utilization and stability. The nutritional dimension is integral to the concept of food security’ (FAO 2009).

**Chapter two: Analysis of Food Production Systems**

**2.1. Food Production issues**

Agriculture is the basic source of food, and farmers are the basic food producers. Farmers are greatly diverse people, ranging from near-subsistence peasants to corporate businessmen. Identifying the factors that influence the size and composition of agricultural output is impossible without an understanding of the decision making environment of the farm household.

First, understanding why the agricultural sector is different from the other sector and what the social and analytical issues are that flow from these important differences. Second, how do farmers make decisions? Only with a decision-making framework that incorporates the full range of factors influencing farm households is it possible to address the behavior and performance of the food sector as a whole. Third, what government interventions are available to change household decision making and there by change the performance of the food producing sector? Understanding how interventions will affect decision making is more important for agriculture than for any other sector, for the government has very few interventions available that can directly alter domestic food production. But governments can import food, subsidize fertilizer, make agricultural research a priority, or "purchase" food surpluses. Fourth, what are the elements of a successful agricultural development strategy?

The food production issues important to the policy analyst begin with understanding why agriculture as a sector is so different from other industries and why agriculture itself is so heterogeneous from farm to farm and even from field to field. What works in one location may not work in another, even in the same country, because the ecological setting is different or because farm households face different constraints on their decision making.

Five features set apart the agricultural sector from other productive sectors of an economy:

1. its large contribution to national income,
2. the large number of participants,
3. the peculiarities of the agricultural production function,
4. the role of the agricultural sector as a resource reservoir, and
5. the importance of home consumption of output.

***The Share of Agriculture in real GDP***

A large proportion of economic activity is provided by agriculture in most poor societies. Agriculture played a major role in exports, contributing 80.2 percent of the export earnings in 2009/10 and 78.5 percent in 2013/14. If related industries are also counted in, as these develop rapidly in the course of modernizing agriculture itself, the share of this broader agribusiness sector seldom declines to less than one-quarter of national economic output, even in advanced industrial societies. In very few societies do consumers spend less than one-fifth of their incomes on food alone. If other agricultural activities-the input industries and the production of industrial raw materials-are also added in, the continued importance of agriculture is obvious.

***Number of Participants***

In many countries, 60 to 80 percent of the population still lives in rural areas, earning a livelihood directly or indirectly from agriculture. In Ethiopia about 83 percent of the population lives in rural areas and depends entirely on rainfed agriculture for livelihoods. The overwhelming predominance of the rural population has three important consequences for understanding agricultural decision making: most farms will be small because large numbers of people must share the arable land; millions of individuals will each behave according to particular decision making environments; and much of the world's poverty and its human welfare costs will be in rural areas.

***Size of Operations***

The available farmland, of course, is usually not divided equally among all the potential farmers. The conditions of land tenure and the size distribution of farms are important characteristics of a country's agricultural decision making environment. Although exact farm-size distribution is a subject for analysis in each country, its general pattern is important in judging the likely degree of poverty and the income distribution consequences of growth strategies for the rural sector.

*Smallholder productivity and incomes.* About 32 percent of Ethiopia’s area is considered agricultural land. Twelve million smallholder household farms account for an estimated 95 percent of agricultural production and 85 percent of all employment in the country. The average sizes of smallholder farms range from 0.5 to 1.2 ha.

***Agriculture as a Resource Reservoir***

Agriculture does play a unique role in providing resources for economic development. A healthy rural economy creates productive employment for a large population that might otherwise seek jobs in the overcrowded cities, while it provides opportunities for investing in new technology with some of the highest returns available in any sector.

**2.2. Characteristics of Agricultural Production**

The agricultural products are having different nature than industrial products. Several other features contribute to the uniqueness of agricultural production. The most important features are three types on the basis of **production, marketing and consumption**.

**1. Production-related features of agricultural goods**

**(A). Seasonal production**

Most of the agricultural goods are produced only in certain season. The food crops such as maize, wheat…cash crops such as sugarcane, tobacco and vegetables, potato and fruits are produced in certain suitable seasons. But some products such as fish, dairy products, eggs etc. can be produced in all seasons. Everything cannot be produced in all seasons. So, seasonal products affect agricultural market.

No agricultural region of the world has an absolutely constant year-round climate. Climatic variations cause agricultural production to follow distinct seasonal patterns even in most tropical areas, but seasonality is not a fixed and rigid constraint. Rice will grow in the dry season if irrigation water is provided, and tomatoes will grow in Siberia in January under artificial lights in a warm greenhouse.

One of the major tasks of government policy is to invest in socially profitable interventions, such as irrigation and drainage, that increase farmers' control over the crops that can be grown in particular regions and seasons. Seasonality also tends to place high premiums on the timely performance of such critical agricultural tasks as plowing, planting, cultivating, and harvesting.

**(B). Geographically Dispersed Production**

Except some limited goods most of the agricultural goods are produced in all parts of the country. As the farmers live scattered in different parts of the country, middlemen collect agricultural products and supply to markets.

This wide geographical dispersion of agricultural production has an important economic consequence. Transportation becomes essential if any output is going to leave the farm for consumption by others or if inputs, such as modern seeds, fertilizer, pesticides, or machinery, are to be used on the farm to raise output.

**2. Marketing-related features of agricultural goods**

**a. Perishable products**

Most of agricultural products are of perishable nature, but all are not equally perishable within same duration of time. Some perish within shorter time and some others remain usable for little longer. Fish, milk, meat, fruits, vegetables etc. remain fresh only for shorter time, so they are quick perishable. Such products should be supplied to market as quicker and possible. Special cold storage is needed to keep such goods safe and fresh. Food crops/grains such as rice, wheat, mustard etc, remain usable relatively for long time.

**b. Bulky products**

Most of the agricultural products are weighty and bulky. So, [**transport**](http://marketinglord.blogspot.com/2012/06/role-and-importance-of-transportation.html) and storage cost rises higher than the value of these products.

**c. Quality and quantity variation**

Quality and quantity of agricultural products become different according to the productivity of land, season and climate. The quality of seeds, use of fertilizers etc. also causes difference in quality.

**3. Consumption-related features of agricultural goods**

*The consumption features of agricultural products are as follows:*

**a. Continuous consumption**

Agricultural products are very important to meet daily needs of people. So, it is necessary to have regular supply of agricultural products such as food grains, fish, meat, milk, fruits etc to satisfy daily demand.

**b. Inelastic demand**

[**The demand**](http://marketinglord.blogspot.com/2012/05/concept-and-methods-of-demand-creation.html) for agricultural products remains relatively less elastic. Demand for such products does not decrease or increase due to rise or fall of prices. The consumers are compelled to meet their daily needs at minimum level, even if the price of agricultural products rises up.

**c. Price fluctuation**

The price of agricultural products remains unstable. It fluctuates time and again. [**The price**](http://marketinglord.blogspot.com/2012/06/factors-affecting-price-determination.html) of agricultural products is easily affected by supply and demand.

**Problems faced in the production of Agricultural goods**

1. Seasonal production

Unlike consumer goods and industrial goods which are produced throughout the year, agricultural goods can be produced only during a specific period in a year. There are summer crops and winter crops. Certain crops need lot of water. There are others that require only minimum water. In view of all these differences, all the crops cannot be grown in all the months in a year.

2. Difficult to control production

In the case of consumer and industrial goods it is possible for the producer to exercise direct control over production. But in the case of agricultural goods nature plays a vital role in production. If the cultivator has sown the seeds and is awaiting rains, failure of rains will hamper production. Agricultural production is much dependent on the availability of abundant water. Availability of water depends on rainfall.

3. Difficult to control quality and quantity of output

The producers of agricultural production cannot control both quality and quantity of output. Even if the producer (the farmer) uses good quality seeds, fertilizers and manures, the quality and quantity of output are determined mainly by natural factors.

4. Long waiting period

Production of consumer and industrial goods takes place almost continuously on a daily basis. But in the case of agricultural goods, the gestation period is too long. Thus, continuous production cannot be thought of.

5. Loss of crops due to pests and animals

The crops need to be protected from pests and animals. Every year, farmers suffer heavy loss of revenue due to crop loss caused by the activities of pests, insects and animals. To protect their crops, farmers, therefore, use pesticides, insecticides and so on.

6. Small-scale production

The small and marginal farmers hardly own a few acres of land. The quantity of output they turn out is hardly sufficient for their family needs. In fact, most of these people produce for their families rather than for the market.

7. Use of primitive techniques of production

In developing countries, farmers follow the conventional methods of production which affect the yield. They do not have access to the latest machines and equipment because they cannot afford to have these.

## 2.3. Food Production Analysis

Because of agriculture's extraordinary diversity and heterogeneity of decisions required daily from farm to farm and in the entire marketing system, the sector is unique among major productive activities. This diversity places a heavy premium on decentralized decision making. As noted earlier, collective ownership and decision making offer important gains in some areas of rural life, especially reduction of risk for individual households and more equal distribution of assets and incomes.

This section explains the nature of the production decisions that need to be made and the choices of individuals in the agricultural sector as they work to improve their personal or household returns from farming.

Understanding of the features that make agriculture a unique sector, analysts are ready to address the basic production decisions farmers must make to function effectively: what crops to produce, what combination of inputs to use to produce them, and what total output to produce. These decisions are related to each other in an economic decision making framework that provides a rationale for farmer response to changed incentives.

**Product-Product Decisions**

From an often-wide array of possible crops, farmers must decide what commodities to produce. These choices about which products to grow-often called product-product decisions-are faced annually, sometimes even monthly, by farmers. To make such choices in a rational fashion, farmers must assess the opportunity cost of growing more of one crop at the expense of another.

* Deals with the *allocation of resources among different* crops
* The **objective** of p-p r/ship is **profit maximization**.

**Factor-Factor Decisions**

When the farmer has decided which **crops to grow**, the next decision is **how to grow them**. To a significant extent farmers can use varying **combinations of factors** of production, or inputs, to produce a **given crop**. When the inputs are labor and capital, these factor-factor decisions have important consequences for **employment and income distribution in rural areas.** The extent to which **labor and capital might substitute** for each other in the agricultural production process.

* **Cost minimization is the goal** of factor -factor relationship.
* **Guides the producer** in deciding ‘**HOW TO PRODUCE**’.
* **Concerned with the determination of least cost combination of resources.**

**Factor-Product Decisions**

Agricultural performance is linked to macro policy not only through farm-level decisions about which crops to grow and how to grow them, but also through the overall response of total farm output to the economic environment that determines the profitability of more intensive agricultural effort. Policymakers are concerned about the **outcome of farmers' decisions**, for they determine the **level of food grain supplies, the availability of foreign exchange earnings from the agricultural sector, and incomes in rural areas.** To understand how these decisions are made and how they affect such important variables of policy concern, a production function relating **inputs to output** is a convenient conceptual **tool**.

Various technical relationships, the prices of inputs, and the output price the farmer expects are all weighed in the decision of how **intensively** **to use factors to produce output-the factor-product decision**.

* It ***guides in the determination of optimum input to use*** and **optimum output to produce**..
* It solves the problems of **how much to produce** ?
* what total output to produce.

## 2.4. Policy Analysis Matrix

A successful agricultural policy, needs to be carefully designed and implemented to be effective.

To do so requires a sound understanding of the objectives that such a policy wants to pursue and of the constraints that the sector faces. Only with such knowledge it is possible to choose the appropriate instruments that constitute the actual policy.

Policy analysis can be described as the technical and economic work that considers alternative policy instruments, assesses and evaluates the impact of the chosen policy and infers lessons for the future from its implementation (Ellis, p. 23). The role of policy analysts is very important in guiding the decision process that policy makers would accomplish.

**The conditions that a viable sectoral policy should obey are:**

**Economic** **sustainability**: The policy must prove to be economically advantageous. A policy which cannot be proven to be linked to any clearly identifiable economic benefit for the economy, is not going to be supported for long time.

**Social and political sustainability:** The benefits must be shared by large part of the population, which in the less developed countries correspond to the poorest part of the population. In absence of large consensus, no policy can be sustained for long time, lest the risk of social uprising and revolts.

**Fiscal sustainability:** Many policies have an explicit budgetary cost. Policy whose source of financing is not clearly identified should not be undertaken.

**Institutional sustainability:** Many policies needs the development and activity of institutions to support them. When the institutional capacity to support the policies is low, the effectiveness of the policy is strongly undermined.

**Environmental sustainability:** Finally, and very important, all economic policy should be assessed also in terms of their long run impact on the environment. Water reserves, fisheries stocks, forests and soil should be protected against overexploitation by avoiding policies that do not create the correct incentives towards the conservation of the natural environment. Sustainability refers to the long term viability of a set of action.

**The Policy Analysis Matrix**

Policy analysis matrix the process of thinking about and measuring the effects of agricultural policies. It describes policies as instruments to achieve particular objectives and identifies when government intervention can help an agricultural sector to run more efficiently. At the end an analyst can approach measuring the effectiveness of agricultural policies. keeping agricultural prices at a low level, for example, investments are discouraged and the growth of the sector in the long run is compromised. how to identify such tradeoffs.

**3. Food security and Nutrition**

**Food** is Edible or potable substance (usually of animal or [plant](http://www.businessdictionary.com/definition/plant.html) origin), consisting of nourishing and nutritive [components](http://www.businessdictionary.com/definition/component.html) such as carbohydrates, fats, proteins, essential [mineral](http://www.businessdictionary.com/definition/mineral.html) and vitamins, which (when ingested and assimilated through [digestion](http://www.businessdictionary.com/definition/digestion.html)) sustains life, generates [energy](http://www.businessdictionary.com/definition/energy.html), and [provides](http://www.businessdictionary.com/definition/provide.html) growth, [maintenance](http://www.businessdictionary.com/definition/maintenance.html), and [health](http://www.businessdictionary.com/definition/health.html) of the body. Food is any nourishing substance that is eaten, drunk, or otherwise taken into the body to sustain life, provide energy, promote growth, etc. **Nutrition** is the process of taking in food and use them for health and growth.

**Nutritional Security**

Achieved when secure access to an appropriately nutritious diet is coupled with a sanitary environment, adequate health services and care, to ensure a healthy and active life for all household members.

**Food Security** exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. In an expanded form, the World Bank defines food security as “the physical, social and economic access to sufficient, safe and nutritious food by all, at all times, to meet their dietary and food preferences”.  **Food and nutrition security** is about ensuring that everybody is able to access sufficient, affordable and nutritious food.

**3.1. Understanding the Hunger and poverty**

It is very important to understand how these concepts are related to food insecurity. We provide a brief discussion of each of these concepts below:

**Hunger** is often used to refer in general terms to MDG1 and food insecurity. Hunger is the body’s way of signaling that it is running short of food and needs to eat something. Hunger can lead to malnutrition.

**What Is Poverty and Why Measure It?**

Poverty is “pronounced deprivation in well-being.” The conventional view links wellbeing primarily to command over commodities, so the poor are those who do not have enough income or consumption to put them above some adequate minimum threshold. This view sees poverty largely in monetary terms. The broadest approach to - poverty is the one articulated by Amartya Sen (1987), who argues that well-being comes from a capability to function in society. Thus, poverty arises when people lack key capabilities, and so have inadequate income or education, or poor health, or insecurity, or low self-confidence, or a sense of powerlessness, or the absence of rights such as freedom of speech. Viewed in this way, poverty is a multidimensional phenomenon and less amenable to simple solutions. In this view the analyst goes beyond the more traditional monetary measures of poverty: Nutritional poverty might be measured by examining whether children are stunted or wasted; and educational poverty might be measured by asking whether people are literate or how much formal schooling they have received.

**How and why measure poverty?** There are four reasons to measure poverty:

1. To keep poor people on the agenda
2. To be able to identify poor people and so to be able to target appropriate interventions
3. To monitor and evaluate projects and policy interventions geared to poor people
4. To evaluate the effectiveness of institutions whose goal is to help poor people.

Three steps need to be taken in measuring poverty:

1. Defining an indicator of poverty
2. Establishing a minimum acceptable standard of that indicator to separate the poor from the nonpoor (the poverty line)
3. Select a poverty measure to be used for reporting

First, one has to choose the indicator of poverty. Second, one has to select a poverty line, that is, a threshold below which a given household or individual will be classified as poor. Finally, one has to select a poverty measure to be used for reporting for the population as a whole or for a population subgroup only.

As indicator of poverty, one may have a choice between using income or consumption expenditure. Most analysts argue that, provided the information on consumption obtained from a household survey is detailed enough, consumption will be a better indicator of poverty measurement than income for the following reasons):

First, consumption measures of wellbeing are often preferred to income measures as they more accurately reflect a household’s ability to meet its basic needs, with income being only one of the factors determining whether it is able to meet those welfare requirements, or not (World Bank, 2014c). On the other hand, income is only one of the elements that will allow consumption of goods; others include questions of access and availability. Secondly, consumption may be better measured than income. In poor agrarian economies, incomes for rural households may fluctuate during the year, according to the harvest cycle.

Poverty is measured by comparing individuals’ income or consumption with some defined threshold below which they are considered to be poor. The first step that is to be taken is distinguishing the poor and non-poor. In order to make this classification, demarcation points or line is required to be drawn to have single measuring yardstick in poverty analysis. Poverty line, which is used as the yardstick starting point for poverty analysis in determining who is poor and who is not.

People are counted as poor when their measured standard of living (generally in either income or consumption) is below poverty line, otherwise non-poor (Rath, 1996). Based on this, three poverty measures identified by Foster et al. (1984) are employed. These include headcount index, the poverty gap index, and severity index or Foster-Greer-Thorbecke (FGT) index of poverty. The formula has been successful in providing a quantitative description of the spread, depth and severity of poverty in populations.

The mathematical expression of the model is specified as:

$$P\_{α}=\frac{1}{n}\sum\_{i=1}^{q}\left(\frac{Z-Y\_{i}}{Z}\right)^{α} , α\geq 0 (2)$$

Where,

 Pα= poverty measure

 Z = poverty line

 Yi = income level

 n = Population number

 q = is the number of poor

 *α* = is the weight attached to the severity of the poor

The estimation of poverty measures P for α=0, 1, and 2, which respectively define, the head count index, the poverty gap index, and the squared poverty gap index.

**The head count index:** The headcount index(P0) measures the proportion of the population that is poor. It is popular because it is easy to understand and measure.

$$If α=0\rightarrow P\_{0}=\frac{q}{n} (3)$$

The greatest virtues of the headcount index are that it is simple to construct and easy to understand. These are important qualities. But it does not indicate how poor the poor are. Consider the following two income distributions:

Clearly, there is greater poverty in country A, but the headcount index does not capture this.

**The poverty gap index: -** The poverty gap index(P1) measures the extent to which individuals fall below the poverty line (the poverty gaps) as a proportion of the poverty line. The poverty gap, avoids the drawback of head count index.

$$If α=1\rightarrow P\_{1}=\frac{1}{n}\sum\_{i=1}^{q}\left(\frac{Z-Y\_{i}}{Z}\right) (4) $$

The advantage of the poverty gap index over the head count ratio index is that, it indicates the depth of poverty, which is, the difference between the poverty line and the mean income of the poor expressed as a percentage of the poverty line. The minimum cost of eliminating poverty using targeted transfer is the sum of all poverty gaps in a population. It measures the transfer that would bring the income of every poor person exactly up to the poverty line, thereby eliminating poverty.

**The squared poverty gap index: -**The widely used measure of the severity of poverty is Foster-Greer-Thorbecke (FGT) index.It is the squared poverty gap index.

$$If α=2\rightarrow P\_{2}=\frac{1}{n} \sum\_{i=1}^{q}\left(\left(\frac{Z-Y\_{i}}{Z}\right)^{2}\right) (5)$$

The squared poverty gap index depicts the severity of poverty by assigning each individual a weight equal to his/her distance from the poverty line. Hence, P2 takes into account not only the distance separating the poor from the poverty line, but also the inequality among the poor.

**3.2. Types of food insecurity**

Food insecurity, a situation in which individuals do not have the physical nor economic access to sufficient, nutritionally adequate, and safe food. Not all households or people suffer inadequate food consumption for the same period of time. This may vary from a short-term experience to a lifelong condition. Depending on time dimension, food insecurity, can be chronic or transitory. The former occurs when there is a constant failure of food acquisition while the latter refers to a temporary failure of acquisition caused by drought, war, short-term variability in food prices, production, and incomes.

Chronic food insecurity can be overcome with typical long term development measures also used to address poverty, such as education or access to productive resources, such as credit. On the other hand, chronically food insecure people may need more direct access to food to enable them to raise their productive capacity. Conversely, transitory food insecurity is relatively unpredictable and can emerge suddenly. This unpredictability makes planning and programming more difficult and requires different capacities and types of intervention, including early warning capacity and safety net programmes.

**3.3. Dimensions of food security**

Food security is the outcome of food system operating efficiently. Efficient food system contributes positively to all dimensions of food security. Following are the dimensions of food security:

**Availability** refers to the amount of food of appropriate quality provided by domestic production or imports, food stocks and food aid. food availability depends primarily on the agricultural sector and domestic and international distribution systems.

**Access** to food implies that households and all individuals within them have adequate resources to obtain appropriate food for a nutritious diet. Access is both economic and physical. The former depends on the ability of: - Nations to generate foreign exchange to pay for food imports; and - Household to generate the income necessary to buy, or other resources to barter to obtain, enough food. Physical access is mainly connected to the state of infrastructure, market and storage facilities, political stability and income distribution patterns within the household. **Food** **utilization** is the proper biological use of food, required by a diet that provides sufficient energy and essential nutrients, potable water and adequate sanitation.

***Stability*** – to be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access as a consequence of sudden shocks, such as economic or climatic crises, or cyclical events such as agricultural seasons. Stability recognizes that the availability, access and utilization dimensions of food security should be guaranteed at all times.

**Measurement and indicators of food security**

Food security is an unobservable variable with complex, multifactorial causality. So considerable investments have been made in developing useful indicators and data to serve this purpose. The most commonly used indicators rely on direct observation of food insufﬁciency, average individual daily dietary energy consumption or Anthropometric indicators (malnutrition), which are sufﬁcient (but not necessary) conditions for food insecurity.

**Food Insufﬁciency**

In terms of choice of food security dimension to be measured, one option is to select food availability and focus on predicting supply shortages through forecast of seasonal variations in food production through crop, drought, and ﬂood monitoring. This can include longer-term food production scenarios focusing on speciﬁc risks, such as environmental changes. As food availability usually is related to the national or sub-national level, the question addressed by such measure is whether, at the aggregated level, there is sufﬁcient food available to meet aggregate demand. The weakness by using availability as outcome is that it ignores that in most cases, food is not distributed or accessed equally. Second, food availability is often not necessarily the binding constraint to achieving food security at the household level.

**Based on the cost of minimum daily energy requirements**

This indicator estimates the average individual daily dietary energy consumption. It is expressed in kilocalories per person per day (kcal/person/day).This option is to measure the probability of households falling under a speciﬁc consumption threshold as a measure of access to food (based on the cost of minimum daily energy requirements), using a nutritional target of 2,200 calories per capita per day, converted to grain equivalent, as a reference calorie intake to be food secure. The number of food insecure people can be measured as the number or percentage of the population who fail to meet the nutritional target.

**Anthropometric indicators (**malnutrition**)**

A third option is to measure the probability of a negative nutritional outcome. This encompasses all dimensions of food security, including food utilization. The previously discused indicators can be considered as ‘input-oriented’ food security indicators; anthropometric indicators focus on ‘output’. The anthropometric indicators are, **wasting**, **stunting** and **underweight** of children under ﬁve or adults with a body mass index (BMI).

First, low **weight**-for-height, also known as **wasting**, captures short-term substantial weight loss resulting from health problems or acute food shortage. Wasting is strongly associated with child mortality. The second indicator, **stunting**, reflects low height-for-age and is an indicator for chronic malnutrition. A low height-for-age can be the result of a chronic lack of food, infections and disease. In general, stunted adolescents have lower school achievement and work productivity. The third indicator, **underweight**, reflects low weight-for-age and results from the combination of short-term weight loss and long-term growth problems. For elderly, the body mass index is associated with the risk of mortality and morbidity (Shetty 2003).

**3.5. Food Consumption Patterns**

The highest proportion of foods consumed by households come from the cereals/grains group, while dairy is highest among children. Consumption of flesh foods (meat and organ meat) and egg was reported among very few children, women and men. The proportions of foods reportedly consumed of various food groups for each target group across the different regions are different. Besides dairy products, cereals/grains (Wheat, maize, teff and sorghum) contributed most to children’s consumption pattern.

Both developed and developing countries saw their consumers facing the impact of higher food prices, and their producers feeling the pressure from higher input costs. More people on earth, with generally better living standards, consume more and better food, as well as other products and services derived from agriculture. Recently, growth is again accelerating for some commodities, such as oilseeds, cereals and milk, while it is slowing down for other, such as eggs and meat. The reduction in meat consumption growth in the most recent period is linked to tight supply availability, high prices, the effect of the economic crisis and possible changes in consumer preferences in developed countries.

The development of demand growth is not homogenous across regions. Demand in the developed regions has reached a state of maturity, growing at a moderate pace, but demand growth in the developing parts of the world is much faster. The demand across the world is shifting, with demand from developing countries now exceeding the demand from developed countries. The main drivers for a growing food demand are the increase in world population and the increased consumption per capita. The latter is associated with an increase in per capita income.

**3.6. The Food Balance Sheet (FBS)**

The food balance sheet is the primary device for showing average food consumption levels. It can be also defined as an aggregated and analytical data set that “presents a comprehensive picture of the pattern of a country’s **food supply and consumption** during a specified period.”

**Food balance sheets** show the trends in the overall national food supply, disclose changes that may have taken place in the types of food consumed, and reveal the extent to which the food supply of the country is adequate in relation to nutritional requirements. It serves as an indicator food security situation (surplus or deficit) at national or regional levels by taking into consideration the level of domestic production, the balance between imports and exports, level of bufferstock, and level of utilization. It indicates state of food supply available for consumption at national level and is computed as:

* + Domestic production + imports + beginning stock = Domestic utilisation + export + ending stock
	+ can estimate aggregate or per capita food supply and compare with consumption requirement or average per capita food need
	+ evaluates if supply is adequate or import is required

**3.7. Food Consumption versus Nutrition**

The two most commonly used conceptual frameworks show significant differences. The food security framework emphasizes an **economic** approach in which food as a commodity is a central focus. The nutrition framework adopts a **biological** approach in which the human being is the starting point.

However, both frameworks promote an inter-disciplinary approach to ensuring FNS in common. Both acknowledge that food alone is not sufficient to secure a sustainable satisfactory nutritional status and, therefore, aspects of health must be considered. As a result, nutrition is the function of food intake and health status (illustrated in figure -3).

**3.8. Food Consumption Analysis**

Agriculture is the backbone of the **Ethiopian** economy. From the demand side, cereals are the most important diets (in terms of calorie **intake**) for **Ethiopian** households. In particular, teff, wheat, maize and sorghum are the most staple **food** items. But, the **consumption** of each item is affected by the household income.

According to production data obtained from CSA, more than 62 percent of the domestic grain production was used for human consumption in the past five years. Cereals constitute 87 percent of the total grain crops production. Pulses and oilseeds account for 10 percent and three percent respectively. Local production of cereals, pulses, oilseeds, and starchy roots including enset/Kocho are the major source of food that makes up the staple food basket in Ethiopia.

The analysis of food consumption data serves two specific functions. First, the analysis provides the parameters to understand consumption adjustments in the macro food economy. What happens to total cereal demand when prices fall or incomes rise? If cereal availability changes, what will happen to prices? Second, the analysis helps determine the likely nutritional impact of changes in the economic circumstances of the poor. What happens to the consumption bundle of the poor when their incomes change and prices fluctuate for the commodities they consume? Empirical investigation of food consumption data provides some answers to these questions.

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**3.9. Food Saftey and Food Security**

Food safety refers to the potential hazardous agents or contaminants present in food that can cause an adverse health effect. They may occur during all stages of food production, from farm to fork. Food borne hazard occur through “chemical (*pesticides)* or physical agent (metal fragments ) in food. Food security include food safety. Food security and food safety are both public health issues. Both aims to protect and promote health.

**Major Challenges in Achieving Food Security**

Many factors interact to create food-insecure situations: chronic poverty, low agricultural productivity, high rates of population growth, civil conflict, poor infrastructure, inappropriate economic policies, limited arable land and even cultural practices developed over many years. These are not discrete, independent factors, but related elements of the food security equation.

The chief cause of food insecurity is chronic poverty: persistent lack of economic opportunity either to produce adequate food or to exchange labor for the income to purchase adequate food. A related major factor affecting food security is the underlying dynamic of **population** growth. Approximately 100 million people will be added to the world population every year for the foreseeable future. By the year 2025, the population will total 8.5 billion, of whom 7 billion will live in developing countries. Sub-Saharan Africa will grow from 500 million today to 1.2 billion by 2025.

**Agricultural** output, is another major factor in the world hunger equation. A related factor contributing to food insecurity is **poor infrastructure**. Improved on-farm productivity will not increase food security if farm production is unable to make it to market. Farm-to-market roads, for example, may be poor to non-existent, hampering distribution and access to food. Sufficient and well-functioning infrastructure is essential to facilitate exchange and access to markets.

**Inappropriate policies**, which result in disincentives to local production and efficient marketing, are another cause of food insecurity. Often local farmers have no incentive to invest in sound agricultural or environmental practices because of price controls, insecure land tenure.

**Households’ Coping Strategies Practiced in Ethiopia**

The coping strategy a household adopts depends on their food insecurity levels. Households facing extreme hunger and starvations for long periods of time may end up adopting negative coping practices like going without food for long periods of time and minimizing the number of meals consumed in a day. Households in pastoral and Agro-pastoral areas of the country move from one place to another especially in dry seasons looking for water and pasture for their livestock. Alternative coping strategies amongst the pastoralist are sale of livestock more than usual, borrowing food, reducing the number of meals, reducing the size of meals, sale of firewood and charcoal, seasonal migration, seeking alternative or additional jobs, seeking relief assistance, household splitting, remittances, etc.

**Measure to improve food security**

Achieving food security has always been a complex development challenge. Individual country circumstances vary widely and selecting appropriate measures requires experience and the ability to respond to local needs. Sustaining improvements in food security requires the ability to understand issues at the global, national, community and household level.

**Improving food availability:** Instruments for stabilizing food availability must aim at ensuring the supply of nutritionally adequate food. This stability can be achieved through domestic production, domestic food stocks changes and food imports. Instruments for improving national production include investments in irrigation, research into drought/pest resistant varieties and encouraging farm level adoption of new technologies. These also include the provision of effective agricultural extension services addressing longer-term food production issues as well as rehabilitating agricultural activities aftershocks affecting production. **Commercial** **imports** by the public or private sector—play a crucial role in stabilizing food availability in low and middle income developing countries, but foreign exchange constrains can limit the capacity to use this instrument (Barrett 2001). An alternative is to maintain **buffer** **stocks**, either public, private or community based, to assist in spreading out the impact of local, regional, or national harvest failures or in seasonally cut off areas.

**Improving access to food :**For large numbers of people in Africa, food security depends as much on income as on food availability. People who have sufficient money will always have enough economic access to food. Thus, effective efforts to eliminate poverty and enhance the purchasing power of the poor and other vulnerable groups will also serve to build food security. Government action to promote the long-term availability of food on a sustainable basis must be complemented by measures to ensure economic and social, and physical access to food, particularly by poor and vulnerable groups.

**Economic and social access**

Instruments for managing access to food aim at ensuring that households are able to meet food consumption needs. This requires instruments that stabilize households’ purchasing power/consumption ability through asset management and by stabilizing income ﬂows and/or stabilizing food prices. Guaranteed employment for food insecure groups is a major means of ensuring economic access to food. Public employment guarantee schemes, such as food-for-work or cash-for-work schemes, not only ensure minimum levels of food consumption, but also help people avoid resorting to damaging coping mechanisms that involve asset sales and indebtedness. Such schemes could employ large numbers in forest conservation, land contouring and integrated watershed development.

Certain groups must have the protection of the State for food security to be assured on an equitable basis; these include groups who are marginalized and face discrimination on the grounds of one or more of these factors: gender, economic status, vulnerability as single parents or widows heading households, disability and illness, especially living with communicable diseases. This may require, among other measures, review and amendment of legislation and practices to ensure gender equality concerning inheritance and ownership of productive resources, so that women’s equal right to food is explicitly protected.

**Physical access:** Proactive government support for transportation, primary processing and marketing infrastructure to shorten the supply chain between farmers, retail outlets and consumers would lower the costs of food and enhance access. To enhance access to food, storage and marketing institutions and practices need to be streamlined, with improvements in the corresponding infrastructure and services. **Measures** can include realigning roads away from unstable slopes and ensuring the availability of a range of transport options for emergency food distribution.

**Improving utilization of food :** Proper food utilization evolve around protecting health status of individuals. The main instruments are concerned with improving nutrition and healthcare practices, health service delivery, ensuring access to safe water and sanitation, but also with protection of food quality and safety. For this, there is need for strong **multisectoral** policy and programme coordination among all systems across the food chain on monitoring, reducing, controlling and treating infectious diseases. For example, public health measures providing constant access to potable water, promoting hand washing with soap at appropriate times, consumption of safe drinking water, and use of proper sanitation facilities are part of health promotion and environmental hygiene to significantly reduce vulnerability to water-borne and other diseases that prevent food absorption. Mandatory treatment and recycling of solid and liquid wastes reduce food and water contamination and improve food utilization through, among others, elimination of water-borne and microbial diseases. Access to health services is the key to mitigating disease-related risks to food security.

**4. Marketing Functions, Markets and Food Price Formation**

Maintaining food security at the national and household level is a major priority for most developing countries, both for the welfare of the poor as well as for political stability. In order to help assure food security, developing country governments have adopted various strategies including efforts to increase production (often with an explicit goal of food **self**-**sufficiency**, government intervention in **markets**, public distribution of food and maintenance of national food security stocks and **food** **aid**, is often a major component of these food security strategies.

The food marketing sector transforms the raw agricultural commodities produced by farmers into the foods purchased and eaten by consumers. The **costs of storage**, **transportation**, and **processing**-the marketing transformations-are an integral **component of food price formation**. Because the producer and consumer are typically different individuals, commodities must pass from one owner to another, frequently many times, before reaching the end consumers. This process of exchange takes place in **markets** and can be conducted only when a price has been agreed on between buyer and seller. These three topics are inextricably linked-the productive functions of marketing, the role of the market as an arena of exchange, and the formation of food prices at which exchange takes place.

Economies use **Markets** to determine prices and allocate resources. The term "marketing functions" is used to refer specifically to the commodity transformations in **time, space, and form** that are associated with **storage, transportation, and processing**. Marketing function - is a fundamental physical process or service required to give a product the **form**, **time**, **place** and **possession** utility(usefulness) to consumers’ desire (Branson and Norvell, 1983).

**Storing**: - provides time utility to the product and involves handling of a product for a certain period of time until it is needed for final use or further processing. **Transporting**: - is a vital function in the marketing system as it connects all stages between production and consumption. Provides place utility to the product, making it available at places where it is demanded. **Processing**: - Most agricultural products undergo different processing stages till they meet the desired form of consumption.  It provides form utility to the product.

**4.1. Marketing Issues**

The market plays an important role in ensuring food security, if it is used efficiently in such a way that an optimal allocation of agricultural production originating from the place of production is transported to the place of consumption and if the market provides adequate incentives to the farmers to increase output. Demeke (2003) has identified the attributes of the Ethiopian food market as; inadequate market information system with a weak bargaining power of farmers, and undeveloped industrial processing sector. Also, infrastructure, such as road transportation is commonly poor.

The market price of agricultural products is highly volatile. In the main harvesting season the price has been severely depressed to its lowest level because a large amount of the annual production sale occur immediately after the harvesting season January to March. When farmers are running out of stock, during the months of June to August, the price of agricultural production in general goes up. The volume offered at the cereal market drop sharply in the years of poor harvest causing the price to rise considerably. The seasonal fluctuation of price is estimated to discourage investment to maximize output. Surplus producing farmers would also be reluctant to make important investment in using inputs such as fertilizers and improved seeds in the presence of price instability.

Another issue, most importantly, food may also fail to reach the poor because of the operations of exploitative intermediaries. Farmers can also be exploited by traders. Among the major structural characteristics of a market are the degree of concentration, that is, the number of market participants and their size distribution; and the relative ease or difficulty for market participants to secure an entry into the market.

**Competition and the number of Market Participants**

The issue is the number of participants in the chain in between and the potential access of additional participants if the returns to providing marketing services rise above the level dictated by competitive equilibrium. If only a single retailer (the monopoly position) is available for miles around, the potential for high profits is great. In such circumstances the analyst must wonder why other retailers do not join the action.

**Competition** is a powerful force in economies. It is the "invisible hand" that guides private self-interest into maximizing social welfare. For competition to play this powerful role, however, there must be an **adequate number of participants** on both sides of the exchange relationship so that no single agent can significantly influence the outcome of the exchange. It is generally assumed that a market is competitive if:

1. there are many buyers and sellers in the market,
2. there are no dominant market participants powerful enough to pressurize competitors or engage in unethical marketing practices,
3. there is free entrance of buyers and sellers to the market with no special treatment to particular groups or individuals, and
4. there is a homogeneous product so that customers are indifferent between supplies offered by alternative channels.

**Efficiency of Price Formation**

Prices are formed efficiently when large numbers of buyers and sellers, all with similar access to relevant market information, interact to agree on a basis of exchange, a price. This price sends signals to consumers about the resource costs of supplying the commodity to them. It simultaneously sends signals to producers about the willingness of consumers to pay the resource costs of production. Efficient price formation is essential to the efficient allocation of resources in a market-directed economy.

Failure to receive accurate signals about these opportunity costs can cause enormous misallocation of resources in food production and consumption and very serious disruptions to the smooth temporal flow of food supplies to consumers.

**Market Failure**

Market power is an example of a market failure; private sector suppliers (or consumers) are able to influence prices because their numbers are small and because buyers (or sellers) have no other market outlets. Another type of market failure arises because of externalities-costs or benefits from production activities that are not fully reflected in market incentives. Soil erosion, environmental pollution, and overutilization of common property resources are common externalities. The existence of such externalities and the failure of market-determined outcomes to provide efficient solutions are reasons for the analysis and design of food policies where government is an important participant in the food system.

**4.2. Price and Income Policy**

All agricultural price policy instruments (**taxes and subsidies, trade restrictions**) create transfers either to or from the producers or consumers of the affected commodity and the government budget. Some price policies affect only two of these three groups, whereas other instruments affect all three groups. In all instances, at least one group loses and at least one other group benefits. **Taxes and subsidies** on agricultural commodities result in transfers between the public budget and producers and consumers. **Taxes** transfer resources to the government, whereas **subsidies** transfer resources away from the government.

Subsidizing wheat imports, for example, causes the domestic price of wheat for both consumers and producers to be less than the **world price.** As a result, the quantity of wheat produced domestically **declines**, the amount consumed locally **increases**, and wheat imports are greater than before the subsidy was introduced. The government must use budget resources to lower the price of wheat, and this makes **consumers better off**. In this short-run, when consumers gain, however, **the producers of wheat lose** because their **domestic production, sales, and profits are reduced** because of the lower price of wheat. In effect, producers are forced to **transfer income to consumers**.

**4.3. Domestic Markets and Price Policy**

To avoid substantial fluctuations in **domestic** **market** prices, many governments establish a set of policies, choosing among international **trade** **controls**, storage schemes, price fixing, and **rationing**. All consumers would like food prices to be lower, to take a smaller portion of their family budgets. All farmers would like their crop prices to be higher, to provide them greater return for their effort and investment. Food prices are too high." "Crop prices are too low." Both complaints are heard in virtually all countries. The tension between the two, the food price dilemma, inevitably focuses the attention of **consumers, producers, and policymakers** alike on the **margin** between farm prices and consumer prices. All these groups point to the middleman and say "**marketing costs are too high**."

One obvious way to keep **farm prices** high and consumer **prices low** is to minimize the **marketing margin**. Since real economic resources are required to **transform food crops in space, time, and form** to food that consumers buy and eat, keeping margins below their private costs requires a government subsidy.

**Food subsidies and food price stabilization:**

Food subsidies and food price stabilization schemes have been implemented in most nations of the world at some time. These programs change the food price distributions faced by consumers (and often producers) and thereby inﬂuence food security. Such schemes have come under increasingly intense criticism over the past twenty years because most food subsidy programs are regressive higher-income individuals purchase more food and thereby beneﬁt more from generalized subsidies and are therefore extraordinarily expensive if they are to have substantial impact on the most vulnerable segments of the population.

Similarly, food price stabilization is often seen as an expensive, ineffective intervention that generates little or no net beneﬁt. Proponents argue that there are important exceptions to this rule, for instance where subsidized foods are provided only through “fair price shops” to which only the poor have access or via inframarginal quantity-rationing through ration shops, or when the government subsidizes low-quality or inferior goods consumed only by the poor.

Governments can combat transitory food insecurity through price stabilization schemes effectuated through variable **trade** duties, direct state trading (domestically, internationally, or both), or **buffer** **stock** management. Trade and storage are complementary methods for maintaining stable food consumption patterns in the face of unstable production patterns. Steady reduction in tariffs, communications, and transport costs has gradually reduced the real cost of trade relative to storage. Consequently, international trade (including properly timed food aid) is increasingly preferable to interannual food storage as a means of preempting or mitigating transitory food insecurity, at all levels.

**4.4. Trade restrictions**

With the term trade policies we indicate the set of public intervention intended at modify the volumes of import and/or exports. By modifying the volume of international trade, these policies effectively drive a wedge between domestic prices and world prices. One way of doing so could be through an intelligent combination of import tariffs and quotas that limit either imports or exports. Import restrictions raise domestic prices above comparable world prices, whereas export restrictions lower domestic prices beneath comparable world prices.

**Tariff** is taxes levied on imports, so that the effective domestic price becomes higher than the world price. In general, the effect of a tariff is to provide economic protection for domestic production, because it makes imported products more expensive in the domestic markets.

For imports, the trade policy imposes either a per unit tariff (import tax) or a quantitative restriction (import quota) to limit the quantity imported and raise the domestic price above the world price. Likewise, trade policy for exports limits the quantity exported through imposition of either a per unit export tax or an export quota, and the result is to cause the domestic price to be lower than the world price.

If, for example, a trade policy restricts imports of wheats through imposition of a tariff, producers of wheats gain because the domestic price rises above the world price. In response to higher local wheat prices, production expands, consumption declines, and the quantity of imports is reduced. Since the domestic price is raised, consumers transfer income to producers and to the government budget because of the duties paid on imports. Each price policy can be analyzed to determine the impact on quantities produced, consumed, and traded.

**Quotas is** alternative type of intervention on trade is to restrict the volume of import or export through quotas. The effect of a quota on import is the same of an equivalent tariff. The only apparent difference is that the government will not earn the tax revenue.

**4.5. Food stamps/giving food without pay/Rationing**

Food stamps have been widely used as the main government program for reducing hunger among poor people. Food stamps are coupons given to eligible persons to use as cash in order to acquire food in regular retail outlets, which then redeem the coupons, like checks, through the banking system.

Food stamps form part of a US federal assistance program for low-income individuals and households. Eligible people receive money each month. However, they can only use this money to buy food. The government credits an EBT card, i.e., debit card, each month. EBT stands for Electronic Benefits Transfer. Cardholders can subsequently use their cards to buy food at stores that accept the stamps.

**4.6. Poor people's foods**

Poor people's foods tend to be root crops, grains and others. The preferred staple in most societies are corn, sorghum, wheat and teff. Subsidies to poor people's foods can be effectively self-targeting. If only the poor choose to eat the subsidized inferior staples, only the poor capture the subsidy.

At the same time, many of the inferior foods are produced by very poor farmers on marginal lands at considerable distance from major urban centers. Marketing subsidies that raise the returns to these farmers while lowering the costs to the consumers may work simultaneously on both dimensions of poverty. Simply forcing down prices, however, would have a devastating impact on the incomes and welfare of some of the poorest of the rural poor.

**4.7. Tax and Food Price**

Agricultural commodities can be subject to consumption or production taxes in order to provide fiscal revenue to the government, as an alternative to income tax. For example, it has been a common practice to tax export crops. As an alternative, if for distributive reasons or for fiscal revenue needs a country wants to directly tax the agricultural sector, a tax on primary factors (land, labor, capital) or on income would be a better option.

The consequences of changes in food prices are clearly different for net-consuming and net-producing households of food products. Poor households in developing countries are often net-consumers who spend a significant part of their income on basic food. A food crisis may evoke important behavioural changes at the level of household expenditures. First, households tend to reduce the quality and the diversity of the food consumed. If this is not enough to cope with the food crisis, households start cutting back also the quantity of the food eaten. In particular women reduce their consumption to leave more food for the other household members, thereby acting as the shock absorbers of household’s food insecurity. Finally, spending on basic needs such as education or health may be reduced.

The changing food behaviour of households in response to food crises and the reduction in spending on social services can have severe and long-lasting effects. Children that experience poor health and nutrition (a lack of macro- and micro-nutrients) in their early childhood years fail to reach their potential cognitive and physical development. On the other hand, the net-producing households that are confronted with higher prices for their agricultural products experience an increase in their revenues. Higher agricultural prices increase the incentives for farmers to invest to increase their production capacity.

A government uses **food price policy** to bring about basic changes in **the food system**. **Incentive prices** can encourage production, discourage consumption, and reduce imports. Alternatively, **food subsidies** can reduce production, increase consumption, and increase imports. **All price policies have opposite effects on production and consumption**. To increase both the production and consumption of food would require maintaining a dual price policy involving subsidies to both producers and consumers.

**5. MACRO FOOD POLICY**

**Food policy** – a guideline to ensure regular access to enough food by all in the country. **Food policy objectives** often consistent with the **national development** objectives of a country the objectives focus on:

* + maintaining sufficient food supply
	+ improving food & agricultural marketing systems
	+ ensuring adequate & affordable access to food

**Food self-reliance**

A policy of food self-reliance implies that the country’s production focuses on agricultural export products with a comparative advantage to generate sufficient resources to pay for the imported agricultural products (Magnan et al. 2011, Deb et al. 2009).

**Food self-sufficiency**

A country that is self-sufficient is able to produce all the food it needs (Deb et al. 2009). The main distinction between food self-reliance and food self-sufficiency is that food self-reliance allows for imports as a supply of agricultural products whereas food self-sufficiency is aimed at removing the need to do so, by increasing domestic food production. Aiming for food self sufficiency as a policy is economically efficient if the country has a comparative advantage in growing its own food. However, as a result of a growing scepticism towards international markets and trade, a number of countries continue to stress the shift towards food self sufficiency as a policy priority even though they do not have a comparative advantage in growing basic food crops (The Economist 2009a, The Economist 2009b, Abbott 2009).

**Food Security and Self-Sufficiency policy**

* Food self-sufficiency is the extent to which a country can meet its food needs from domestic production
* It refers to domestic production at a national or sub national level and does not consider other sources of food
* **Food security,** on the other hand, includes all sources of food namely, domestic production, commercial imports, and food aid while food self-sufficiency takes into account domestic production as sole source of supply
* Moreover, supply stability and food access are key considerations in food security
* Hence food security is a broader issue and goes beyond mere supply of food

**Food sovereignty**

The concept was developed as a response to the alleged ‘globalization of poverty and destruction of local productive capacities and rural societies’ (Vía Campesina 1996). Food sovereignty is the right to food require countries and communities to have control of their food supplies: to have a say in what is produced, under what conditions, and what is imported and exported. At the local level, this often entails the rights of rural communities to remain on the land and to continue producing food for themselves and for domestic markets if they choose to.

**Food security and Food sovereignty**

Food sovereignty goes beyond the concept of food security. It demands the access to appropriate food as well as access to food-producing resources, while food security emphasizes only the access to adequate food and does not say anything about the origin of food nor the method of production (Rosset 2003). Furthermore, food sovereignty both includes the right to food and the right to produce.

Food sovereignty is not the same concept as food self-sufﬁciency; self-sufﬁciency implies each country seeks to produce all the food it consumes domestically. Rather, food sovereignty underlines the importance of political choices in meeting food security needs.

**5.1. Food aid**

**W H A T I S I T ? W H O G I V E S I T ? T O W H O M ?**

Food aid is a voluntary transfer of resources in the form of food from one country to another given at least partly with the objective of benefiting the recipient country (critics cite a lot of other motives). Under the broad heading of food aid, the world food programme recognizes three categories of aid, based on the different ways in which the aid is meant to contribute to food security. These three are program, project and emergency food aid. Although the line between these three categories is not always clear, program, project and emergency food aid are distinguished by the different purposes they serve: support for development and nutrition programs, and emergency feeding.

**Program Food Aid**

Program food aid involves the transfer of food from one government to another as a form of economic support. Some program food aid is donated to recipients, while the rest is sold on concessional terms. Program food aid was designed and used to dispose of commodity surpluses in donor countries that could not ﬁnd a commercial market. It has been provided to the **government** in the form of **loans or grants**, mainly to supply the country’s food balance of payments and to provide **budgetary support** (commercial food imports).

* This aid is usually **not targeted at specific groups of beneficiaries**.
* It is normally **sold** on local markets at **subsidized prices**.
* It has also been used to **build up national food reserves**.

**Project Food Aid**

Project food aid supports various type of projects such as agricultural, nutritional and development. It can freely be distributed to targeted beneficiary groups or sold on the open market.

**Project food aid** is provided in the form of grants to support specific **development** objectives and **groups of beneficiaries.** Food is normally **not** provided directly to the **government** but to the **agency** that is implementing the project (usually an NGO orGovernment agency).

Unlike program food aid, project food aid was originally focused on direct distribution to people livingwith hunger. Examples of project food aid include food for work and school lunch programs. Since 1990, the U.S. has allowed an increasing share of its project food aid to be sold to generate funds for development projects, a process called monetization.

**Emergency (Relief) Food Aid**

Emergency food aid is intended for direct, free distribution to people facing famine or an acute food shortage as a result of natural or human-made disasters. Emergency food aid is provided to victims of natural or man-made disasters on a short- term basis. If targeting requirements are not properly met, relief food aid has the potential to **severely distort markets** and **create dependency**.

Emergency food aid is distributed to the food insecure in times of crisis such as war or famine. In some cases the distinction between emergency and project food aid is not clear. For example, in Ethiopia emergency food aid is sometimes distributed through food for work programs. One can therefore not say that all food for work is project food aid, nor that all emergency food aid is distributed for free.

The above **three categories of food aid are linked** and have been used in **combination** or **separately** to **alleviate food crises**. **Programme or project food aid** may be used for **relief** during an **emergency**. The **type** of food aid that is used depends on the **nature and causes of the food deficit**. For example, if the deficit is caused by a **market supply/import deficit**, commercial imports or programme aid will be required.

If the problem is a **demand deficit**, project and/or relief aid that targets people who **lack purchasing power** will be needed. Aid may be supplied to the **whole country**, to a **specific area that** is affected by a disaster or to a particularly **vulnerable community**.

**Delivery Mode (of Distribution)**

Food aid is also categorized by the way the food is sourced. The mode through which food aid commodities are delivered to the recipient country. There are again three ways this happens. **Direct transfers, Triangular purchases and Local** purchases**.**

**Direct** transfers refer to transactions by which food aid is delivered from donor to recipient countries. Direct transfers are food aid donations that originate in the donor country. All direct food aid transfers are a form of “tied aid” in the sense that they are limited by deﬁnition to food sourced in the donor country. In addition, a lot of directly transferred food aid is tied to additional requirements, such as the use of donor-country contractors.

**Triangular** purchases refer to food that donors purchase in a third country for use as food aid in a recipient country. Triangular purchases describe food aid purchased in one country (not the donor’s) for use as food aid in another country. Triangular purchases are usually ﬁnanced by a cash contribution from the donor for the initial purchase of the food.

**Local** purchases refer to transactions by which food aid is purchased and distributed/utilised in the recipient country. It is the procurement of food in the recipient country. This is one of the most cost-effective ways to source food aid, although it is still only a small part of total food aid contributions.

Where food for food aid is obtained can be very important to the immediate efﬁcacy of food aid and to its longer-terms effects on food security. Most aid policy analysts agree that local purchases or triangular purchases from nearby countries are generally preferable to food direct transfers. This is because food can be purchased from less costly sources, because shipping costs are often lower if food travels for shorter distances and because, when properly managed, food purchased locally or from nearby developing countries can stimulate agriculture and other economic activities in hunger-prone regions.

Local purchases are not always the most appropriate use of food aid resources. Before deciding to buy food locally, it is important to assess if enough food is available in the market and whether local purchasing will cause a price spike that might perversely increase hunger by cutting people’s access to food. Some of the other constraints on local purchasing, such as inadequate storage facilities or transportation networks, are problems that must be addressed for long-term development as well. If local purchases can stimulate an improvement in the infrastructure for agriculture, then the programs will address the important strategic goal of supporting local food production, in addition to answering the immediate problem of getting food to hungry people.

**5.2. Stabilizing Agricultural Markets**

**5.2.1. Buffer Stocks (strategic grain reserves).**

**Buffer stocks** are stocks of products which have not yet been taken to market. They can help stabilize prices by taking surplus output and **putting it into a ‘store’**, or, with a bad harvest, stock is **released from storage**. **Buffer stocks are** used to reduce price variation through building up and releasing stocks onto the market. **A target price** can be achieved through intervention **buying and selling**.

**The role of strategic grain reserves /buffer stock**

For a long time, most countries including Ethiopia have included public holding of food stocks as an essential element in their food security policy and strategy in order to ensure stability in food availability. **The food stocks** have been used for both **market** intervention (**price stabilization) and emergency food supply objectives.**

Over-production can be controlled by allocating production quotas to producers. Quotas are agreed quantities that individual producers must produce, and a quota system can help prevent over or under production in response to economic shocks.

Better information about future shocks: Another way to stabilize markets is to encourage producers to make better use of the internet and computer technology to predict the weather. This enables farmers and growers to predict the onset of other potential shocks so that they can react quickly.

**5.2.2. Increasing Domestic Flexibility**

Domestic food policies in relation to WTO objectives ,from a global efficiency point of view, food self-reliance is the best strategy a country can pursue to achieve food security when markets are free and perfect: each country produces the food in which it has a comparative advantage.

**5. MACRO FOOD POLICY**

**Food policy** – a guideline to ensure regular access to enough food by all in the country. **Food policy objectives** often consistent with the **national development** objectives of a country the objectives focus on:

* + maintaining sufficient food supply
	+ improving food & agricultural marketing systems
	+ ensuring adequate & affordable access to food

**Food self-reliance**

A policy of food self-reliance implies that the country’s production focuses on agricultural export products with a comparative advantage to generate sufficient resources to pay for the imported agricultural products (Magnan et al. 2011, Deb et al. 2009).

**Food self-sufficiency**

A country that is self-sufficient is able to produce all the food it needs (Deb et al. 2009). The main distinction between food self-reliance and food self-sufficiency is that food self-reliance allows for imports as a supply of agricultural products whereas food self-sufficiency is aimed at removing the need to do so, by increasing domestic food production. Aiming for food self sufficiency as a policy is economically efficient if the country has a comparative advantage in growing its own food. However, as a result of a growing scepticism towards international markets and trade, a number of countries continue to stress the shift towards food self sufficiency as a policy priority even though they do not have a comparative advantage in growing basic food crops (The Economist 2009a, The Economist 2009b, Abbott 2009).

**Food Security and Self-Sufficiency policy**

* Food self-sufficiency is the extent to which a country can meet its food needs from domestic production
* It refers to domestic production at a national or sub national level and does not consider other sources of food
* **Food security,** on the other hand, includes all sources of food namely, domestic production, commercial imports, and food aid while food self-sufficiency takes into account domestic production as sole source of supply
* Moreover, supply stability and food access are key considerations in food security
* Hence food security is a broader issue and goes beyond mere supply of food

**Food sovereignty**

The concept was developed as a response to the alleged ‘globalization of poverty and destruction of local productive capacities and rural societies’ (Vía Campesina 1996). Food sovereignty is the right to food require countries and communities to have control of their food supplies: to have a say in what is produced, under what conditions, and what is imported and exported. At the local level, this often entails the rights of rural communities to remain on the land and to continue producing food for themselves and for domestic markets if they choose to.

**Food security and Food sovereignty**

Food sovereignty goes beyond the concept of food security. It demands the access to appropriate food as well as access to food-producing resources, while food security emphasizes only the access to adequate food and does not say anything about the origin of food nor the method of production (Rosset 2003). Furthermore, food sovereignty both includes the right to food and the right to produce.

Food sovereignty is not the same concept as food self-sufﬁciency; self-sufﬁciency implies each country seeks to produce all the food it consumes domestically. Rather, food sovereignty underlines the importance of political choices in meeting food security needs.

**5.1. Food aid**

**W H A T I S I T ? W H O G I V E S I T ? T O W H O M ?**

Food aid is a voluntary transfer of resources in the form of food from one country to another given at least partly with the objective of benefiting the recipient country (critics cite a lot of other motives). Under the broad heading of food aid, the world food programme recognizes three categories of aid, based on the different ways in which the aid is meant to contribute to food security. These three are program, project and emergency food aid. Although the line between these three categories is not always clear, program, project and emergency food aid are distinguished by the different purposes they serve: support for development and nutrition programs, and emergency feeding.

**Program Food Aid**

Program food aid involves the transfer of food from one government to another as a form of economic support. Some program food aid is donated to recipients, while the rest is sold on concessional terms. Program food aid was designed and used to dispose of commodity surpluses in donor countries that could not ﬁnd a commercial market. It has been provided to the **government** in the form of **loans or grants**, mainly to supply the country’s food balance of payments and to provide **budgetary support** (commercial food imports).

* This aid is usually **not targeted at specific groups of beneficiaries**.
* It is normally **sold** on local markets at **subsidized prices**.
* It has also been used to **build up national food reserves**.

**Project Food Aid**

Project food aid supports various type of projects such as agricultural, nutritional and development. It can freely be distributed to targeted beneficiary groups or sold on the open market.

**Project food aid** is provided in the form of grants to support specific **development** objectives and **groups of beneficiaries.** Food is normally **not** provided directly to the **government** but to the **agency** that is implementing the project (usually an NGO orGovernment agency).

Unlike program food aid, project food aid was originally focused on direct distribution to people livingwith hunger. Examples of project food aid include food for work and school lunch programs. Since 1990, the U.S. has allowed an increasing share of its project food aid to be sold to generate funds for development projects, a process called monetization.

**Emergency (Relief) Food Aid**

Emergency food aid is intended for direct, free distribution to people facing famine or an acute food shortage as a result of natural or human-made disasters. Emergency food aid is provided to victims of natural or man-made disasters on a short- term basis. If targeting requirements are not properly met, relief food aid has the potential to **severely distort markets** and **create dependency**.

Emergency food aid is distributed to the food insecure in times of crisis such as war or famine. In some cases the distinction between emergency and project food aid is not clear. For example, in Ethiopia emergency food aid is sometimes distributed through food for work programs. One can therefore not say that all food for work is project food aid, nor that all emergency food aid is distributed for free.

The above **three categories of food aid are linked** and have been used in **combination** or **separately** to **alleviate food crises**. **Programme or project food aid** may be used for **relief** during an **emergency**. The **type** of food aid that is used depends on the **nature and causes of the food deficit**. For example, if the deficit is caused by a **market supply/import deficit**, commercial imports or programme aid will be required.

If the problem is a **demand deficit**, project and/or relief aid that targets people who **lack purchasing power** will be needed. Aid may be supplied to the **whole country**, to a **specific area that** is affected by a disaster or to a particularly **vulnerable community**.

**Delivery Mode (of Distribution)**

Food aid is also categorized by the way the food is sourced. The mode through which food aid commodities are delivered to the recipient country. There are again three ways this happens. **Direct transfers, Triangular purchases and Local** purchases**.**

**Direct** transfers refer to transactions by which food aid is delivered from donor to recipient countries. Direct transfers are food aid donations that originate in the donor country. All direct food aid transfers are a form of “tied aid” in the sense that they are limited by deﬁnition to food sourced in the donor country. In addition, a lot of directly transferred food aid is tied to additional requirements, such as the use of donor-country contractors.

**Triangular** purchases refer to food that donors purchase in a third country for use as food aid in a recipient country. Triangular purchases describe food aid purchased in one country (not the donor’s) for use as food aid in another country. Triangular purchases are usually ﬁnanced by a cash contribution from the donor for the initial purchase of the food.

**Local** purchases refer to transactions by which food aid is purchased and distributed/utilised in the recipient country. It is the procurement of food in the recipient country. This is one of the most cost-effective ways to source food aid, although it is still only a small part of total food aid contributions.

Where food for food aid is obtained can be very important to the immediate efﬁcacy of food aid and to its longer-terms effects on food security. Most aid policy analysts agree that local purchases or triangular purchases from nearby countries are generally preferable to food direct transfers. This is because food can be purchased from less costly sources, because shipping costs are often lower if food travels for shorter distances and because, when properly managed, food purchased locally or from nearby developing countries can stimulate agriculture and other economic activities in hunger-prone regions.

Local purchases are not always the most appropriate use of food aid resources. Before deciding to buy food locally, it is important to assess if enough food is available in the market and whether local purchasing will cause a price spike that might perversely increase hunger by cutting people’s access to food. Some of the other constraints on local purchasing, such as inadequate storage facilities or transportation networks, are problems that must be addressed for long-term development as well. If local purchases can stimulate an improvement in the infrastructure for agriculture, then the programs will address the important strategic goal of supporting local food production, in addition to answering the immediate problem of getting food to hungry people.

**5.2. Stabilizing Agricultural Markets**

**5.2.1. Buffer Stocks (strategic grain reserves).**

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**CHAPTER SIX: POLICY ANALYSIS OF THE PRODUCT MARKET**

**6.1. Improving the marketing systems**

The agricultural product that we consume daily reach to us after a long distance gradually passes down the market system from its origin. The efficiency of this system has a direct impact on our everyday lives. The agricultural market system refers to the system through which agricultural products reach our tables, from their origins spread all over parts of the country.

**The policy analysis** is concerned analyzing with the different problems facing the excising marketing systems of the product markets to be inefficient. It provides better information to the government for further intervention.

**History of Agricultural Market System**

In developing countries most farmers were exploited by traders and middlemen, trapping them into selling their produce for low prices than the existing market rates. They were also victims of faulty weighing machines and wrong accounting. Moreover, they did not possess storage facilities making them unable to hold back their produce to sell at a better price in future.

**Sometimes there is glut resulting in depressed prices, whereas shortage of commodities at other time pushes the prices up**. In case of fall in the prices farmers get less value of their output. The middlemen avail this opportunity and purchase that commodity in bulk and store it to sell it at the time of shortage. These situations of glut and shortages in the market make a non-sustainable agriculture sector which is a big hurdle in the way of development.

**Problems of the marketing systems**

In the output sector, there is **price instability** throughout the year. Because of some hindrances that **agricultural marketing faces** are:

* **lack** **of free flow of information about daily market prices** of agricultural commodities. Farmers (especially smaller ones) have least access to market information and fetch low prices of their output.
* Secondly**, marketing** **cost of the agricultural commodities is very high** which shows inefficiency in performing marketing functions throughout the supply chain.
* thirdly, due to **poor post-harvest management**, **product losses are very high**. Major causes of post harvest losses are poor transportation system, inefficient grading, storage, packaging etc.
* fourthly, **Poor infrastructure and transportation** not only reduce the marketable surplus but also deteriorate its quality especially in case of perishable commodities.
* fifthly, the major reason for the price instability **is lack of storage facilities** near the production points.

**Measures of Improvement in the marketing systems**

In addition to a concern for **lowering the real costs of marketing**, governments need to focus on the **efficiency with which marketing services** are provided. **In market economies, inefficiency means excess profits, and excess profits mean monopolistic middlemen or collusion in price formation**. Both sources of excess profits are extremely difficult to regulate directly because of enforcement problems. In the face of solid evidence of market inefficiency (as opposed to high costs), governments are faced with two quite divergent alternatives. The first is to **improve the competitiveness of the marketing system** by creating better **market access** for potential participants who might provide marketing services and by **distributing better information for consumers, producers, and marketing agents** about factors likely to **affect price formation**.

The temptation for governments to intervene in food marketing and price formation is very great. A variety of interventions can contribute to important social goals. Investments can lower marketing costs. Well-managed public buffer stocks can improve price stability and set competitive standards for private markets. Appropriate price levels can improve production incentives or increase food consumption. Narrow margins set by legislation can drive most food marketing activities into hiding. Heavy consumer subsidies for the major foodstuff can distort producer incentives and place enormous burdens on the budget. The government took several steps to achieve the goal of **a regulated and efficient market system.**

Markets are regulated to obtain transparent and orderly marketing conditions. Market information is crucial to enable farmers and traders to make decisions about what to grow, when to harvest, where to market the produce, and whether or not to store it. The provisions of improvement in transportation access or infrastructure. It provided easier and new channels of connectivity.

The provisions of storage facilities or warehouse. Post-harvest losses are also very high 30per cent because of poor infrastructure (from farm to market) and poor transportation facilities especially in case of perishable commodities such as fruits and vegetables. Storage facilities are very costly and small farmers can hardly afford it. Establishment of marketing cooperatives can be the solution to many of the marketing problems.

Purchase of inputs in bulk and their sale to members only can provide them agricultural inputs at right time and at minimum possible price. After harvest of the crop, these marketing cooperatives could accumulate the marketable surplus of farmers and send it to big markets and consumer cooperatives at maximum prices as they have the bargaining power. Also the post-harvest losses are reduced to minimum. In this way the farmers will get maximum reward for their output. When these marketing cooperatives become so much developed they can perform other market functions like storage, grading and packaging etc. In this way the return of the farmers can further be increased.

**6.2. Price ceiling and Floor**

Many primary markets are subject to **extreme fluctuations in price**.  There are several methods of intervention available to governments and agencies for **price stabilization**. The buffer stock managers are likely to establish a price ceiling, above which intervention **selling** will occur, and a price floor, below which intervention **buying** will take place.

**Price ceiling** is used to influence food price structure and production; implemented when marketing price of output considered to be high and expected to affect vulnerable groups. Price ceiling - leading to selling products while releasing from the buffer stock.

**Price floor** isusedto influence food price structure and production; implemented when market price of output considered to be low and expected to discourage farm economy. Price floor -leading to buying products and store it in the buffer stock. However, they can also be criticized because:

1. They encourage over-production creating a surplus
2. there are also extra costs of storage or disposal

**6.3. Crop insurance**

**Crop insurance** is purchased by **agricultural** producers, and subsidized by the federal government, to protect against either the loss of their **crops** due to natural disasters, such as hail, drought, and floods, or the loss of revenue due to declines in the prices of **agricultural** commodities.

**7. Types of Agricultural Policies**

**Agricultural policies** can be classified in several ways, depending on their objectives, the instruments used.

7.1. Price policy

Economic activities are guided by prices. For this reason, one of the most important ways of trying and affect economic activity is through the modification of prices and the policies that aim at modifying producer incentives can be described as price policies.

Which prices are really important for farmers? The result of any firm is measured by profits, which depends on both outputs’ and inputs’ prices. In other words, only if out-put prices rise proportionally more than inputs’ prices, there is an increase in profits. Only if all other prices are kept constant, an increase in output price means an increase in the relative terms of trade between outputs and inputs.

**The determinants of agricultural price**

There is an increase in the **demand** for agricultural products; eventually this will generate pressures towards an increase in prices. Also, and very important for agriculture, a **shortage in supply** (as for example as a consequence of **bad harvests**) for a product which is mainly oriented towards domestic markets, will necessarily cause an **increase in price.**

**Objectives of price policies**

In principle, price policies could be aimed at:

 **- Increasing prices**

**- decrease prices**

**- stabilize prices**

The objectives of price policies, thus, should be pursued through attempts at modifying the effective prices faced by farmers and consumers, which constitutes the real incentives. Price policy measures used to influence

* + producer decision making – what and how much to produce
	+ Consumer decisions on level and consumption pattern

**7.2. Marketing Interventions**

* Aim to improve food marketing system by
	+ improving marketing efficiency
	+ Narrowing the gap between consumer and producer prices
	+ maintaining the quality and standard of food commodities
* Improve marketing margin by reducing marketing costs at all points of the channel
* Also regulatory action on standards, provision of credit to market participants, establish market co-operatives, etc

**Examples**

* Tax reduction on selected strategic commodities
* Develop marketing infrastructure
* Improving market information system

7.3. Input policy

There are also options for the government to affect the incentives to producers through input price and availability. One most obvious way of supporting producers is by granting subsidies on input prices. Payments for variable inputs such as fertilizers, pesticides, other chemicals, but also water and electricity are what constitute a farm’s costs. By subsidizing the price of inputs, the farm’s cost will be reduced. As a consequence, production would increase and, if the output price is maintained constant, producers’ surplus will increase.

When input subsidy is extended to the entire sector, however, it is not clear whether producers will gain or not. It depends on the relative elasticity of supply and demand. In fact, if the demand function is very inelastic, the benefit from input subsides could be transferred completely to consumers.

Small farmers might have problems in adopting the new technology, and the provision of subsidized inputs may be required to provide incentives for the adoption. For example, farmers may be risk averse, and would underestimate the benefits of the new technology. Also, the adoption of new technology may need to be accompanied by improved knowledge on input use and crop-ping technology.

**7.4. Credit policy**

* One most important instrument to meet food security objectives
* Credit (at low rate) can be used to stimulate use of improved technologies, allow development of rural infrastructure and promote marketing activities
* most effective means to influence investment in agricultural production
* Can be facilitated through credit and saving cooperatives and rural credit institutions or agencies
* Major problems – Poor loan recovery; loan diversion to other uses

7.4.1. Relevance of credit for agriculture

 Farmers need funds for three reasons:

* **Working capital**: Given that the production is obtained only by the end of season, while costs are sustained throughout all of the season, farmers need to anticipate money.
* **Consumption smoothing**: Agricultural production is highly variable from year to year, whereas consumption need to be kept constant. Farmers may need to borrow money during bad years and save money during good years.
* Investments: When an investment is realized, its cost is paid at the beginning, while the benefits are only obtained later on during many years.

For all these motives, farmers might use personal savings. However, especially for investments, personal savings are not sufficient, or they require long time before an investment can be done. Also, saved capitals are immobilized and thus they cannot be put in productive use until a sufficient amount has been accumulated. Finally, who has the ability to save, usually is who do not need the capital for making investments. Within the economy, high productivity could be achieved by allowing a market for credit that is to allow for the possibility for capitals to be moved from those who have saved it to those who are in need of it.

7.5. Mechanization (Water use and irrigation) policy

Irrigation can be defined as the use of human technology to increase and control the supply of water for crop production. In most cases, irrigation is supplementary to the naturally occurring supply of water to crops due to rainfall. However, there are important examples where there would be no agricultural production without irrigation (such as in the desert or in arid regions, where rain is condensed in limited times of the year) Since very ancient times, human creativity has developed technologies for irrigation: irrigation works have existed for thousands of years in Asia, the Middle East and North Africa. The first civilizations of human race of the Euphrates and Tigris valleys were possible thanks to irrigation. The power of Egypt was in ancient times fueled by the possibility of using the Nile water for irrigation.

There are technology for water collection and distribution. Water can be collected from surface water (rivers, lakes, glaciers, or even the sea) or from ground water (by digging wells which extract water from aquifers).

The cost of collecting water varies very much, depending on the relative abundance of the water source, on the depth at which the aquifer is located underground, on the quality of the water (for example, it is possible in principle to use sea water for irrigation, but only after desalinization, which may be very expensive). Once the water has been collected, in order to be used for irrigation it needs to be distributed on the cropped land. Some form of simple technologies for water distribution, such as diverting the flow of a river to flood land, have lasted for millennia and are still used today, more or less in the same form. The main characteristic of traditional water distribution systems is that they require large amounts of human labor to monitor and control the flow of water. Also, the effectiveness of water of traditional technologies is very low. Large quantities of water are required, because only a small part of it will be retained by the land and will be useful for the plants. Most of the water will be lost because of running-off or deep percolation.

The fundamental reason why traditional technologies are still used, especially by small farms in developing countries, is because they do not require large investments. In other words, the initial cost of irrigation to the farmer with traditional technologies is very low.

To summarize, the limits of traditional technologies are that:

- it is naturally possible only where abundant sources of surface water are available (rivers, lakes, etc). In order to make it available in other areas, large water distribution systems (such as dams, reservoirs, and long series of canals) need to be constructed.

- the operating cost of traditional irrigation technology is low only if labor is relatively inexpensive to capital.

- relatively large amounts of water are required.

For these reasons, when both water and labor started become scarce, and thus more valuable, modern alternative technologies for water distribution have been invented, which basically substituted capital and technology for labor.

The more common **modern water distribution systems** are *sprinkler irrigation and drip irrigation*. These innovations respond to two main desires: to save labor and to save water.Sprinkler irrigation systems substitutes labor with power pumps and tubes to distribute wateron the land, whereas drip irrigation is designed to reduce as much as possible the loss of waterdue to running-off and to deep percolation.

Both types of irrigation systems have also the advantage that they can be managed by automated

systems, thus further reducing the need for labor. Without government intervention, the type of irrigation that will be used depend on the private incentives. When labor is relatively inexpensive (as is for example for small farms with abundant family labor), whereas investment capital availability is limited, traditional irrigation systems will be common.

Unfortunately, this will mean that the effectiveness of water use will also be limited, and thus irrigation will only be truly feasible where water is abundant. If water is scarce, the diffusion of irrigation among small farms will be impossible. Where instead labor is relatively scarce relative to capital, there will be a strong incentive for adoption of modern irrigation technology. The initial cost of the required investments will be paid for by the savings in labor costs.

In terms of water use, each individual user will have an incentive to use more water. If all of the user do so, every farmer will be affected (because of rationing of the water, increased salinity, etc.). Nevertheless, if one farmer only decide to use less water, he will bear the entire cost of this decision, while everybody else will benefit.

Economists then predict that the outcome will be that all farmers will try to get the maximum amount of water, thus overexploiting the resource. However, this would necessarily mean that agents do not care of what happens to others, and that they cannot communicate and commit with each other to cooperation, which could improve the social welfare.

One of the main tasks of irrigation policy, then, is how to avoid the problem of over exploitation by giving farmers the right incentives for water use. One other relevant aspect of irrigation scheme is how their cost is paid.

Irrigation is crucial for agriculture because it allows for an enormous potential increase in agricultural production. The importance of water is also increased because of links between irrigation and other kinds of policy. First, irrigation water is often a complement to other inputs, such as fertilizers or improved seed. As a result, the overall effectiveness of input subsidies is related to the availability of irrigation. Thus irrigation policy is strictly linked to in-put policy. Also, the most effective use of irrigation water usually requires the adoption of new technologies of the acquisition **of machinery and other fixed investments for which** credit may be needed. As a result, **irrigation** policy is strictly linked to credit policy.

Moreover, the availability of irrigation water may make the cropping patterns available to farmers more varied. Farmers will have the option of growing many different crops if they can use irrigation. This flexibility will increase the elasticity of supply of all crops, because farmers could more easily switch from one crop to another. As a result, farmers’ responsiveness to price policy is increased by availability of irrigation, which provides a link between irrigation and price policies. Finally, the use of irrigation is strictly linked to the use of land: if people have difficult access to land, they will not be able to benefit from irrigation water. Thus, irrigation policy is strictly linked to land tenure policy.

**7.6. Land reform policy**

For most of the poor in developing countries, land is the primary means for generating a livelihood and a main vehicle for investing, accumulating wealth, and transferring it between generations. Land is also a key element of household wealth. Because land comprises a large share of the asset portfolio of the poor in many developing countries, giving secure property rights to land they already possess can greatly increase the net wealth of poor people. By allowing them to make productive use of their labor, land ownership makes them less reliant on wage labor, thereby reducing their vulnerability to shocks.

Given the key role of land as a determinant of access to economic opportunities, the way in which land rights are deﬁned, households and entrepreneurs can obtain ownership or possession of it, will have far-reaching social and economic effects. The implications not only inﬂuence the structure of governance at the local level, but also affect (a) households’ ability to produce for their subsistence and to generate a marketable surplus, (b) their social and economic status and often their collective identity, (c) their incentive to invest and to use land in a sustainable manner, and (d) their ability to self-insure and/or to access ﬁnancial markets. For this reason, researchers and development practitioners have long recognized that providing poor people with access to land and improving their ability to make effective use of the land they occupy is central to reducing poverty and empowering poor people and communities.

**The nature and Definition: Land tenure and Land Reform** **policies**

Land policies often deﬁne who can own land and under what conditions. In some cases the national land policy speciﬁes the duties and obligations of those who have access to land, the rules that have to be followed in utilizing the land, the administrative recourse for resolving disputes and so on. As population grows, land holdings are divided and subdivided as they are passed from generation to generation. Thus many farmers operate on tiny plots of land that can never yield an adequate income. A solution to this problem is the redistribution of land. Clearly, this cannot be done unless there is a government sympathetic to the rural poor and willing to take on the inevitable opposition from the large farmers. Often these large farmers are politically powerful and have the police on their side.

The concept of ‘tenure’ is a social construct that deﬁnes the relationships between individuals and groups of individuals by which rights and obligations are deﬁned with respect to control and use of land. Land tenure is a derivative of the concept of natural resource tenure, which in essence refers to the terms and conditions under which natural resources are held and used (Bruce 1986; Moyo, 1995; Shivji et al., 1998). It is the way land is held by individuals and groups, or the set of relationships legally or customarily defined amongst people with respect to land. In other words, tenure reflects relationships between people and land directly, and between individuals and groups of people in their dealings in land. It includes public and private rights and sets of laws.

Land reform is a process of restructuring the distribution of land ownership rights. This includes the acquisition (voluntarily and/or compulsorily) of land from the state or current owners for redistribution to other groups of people who have historically been dispossessed or disadvantaged. There are several approaches to land reform which include:

1. Land redistribution, which implies expropriation of the fundamental rights on the land from those who currently have it, compensation for such rights, and assignment of the expropri-ated rights to other people.
2. Land resettlement, which means occupation of land over which no one has yet claimed rights;
3. **Tenancy reform**, which means to change the rules concerning legal and illegal types of contracts between landowner and tenants. Involves the transfer of ownership to tenants who already work.

Thus, land tenure reform is one of a range of planned changes in the terms and conditions under which land is held, used and transacted through converting informal rights to formal rights and establishing mechanisms for recognition and management of land and natural resources. Land reform has a mixture of social, economic and political objectives.

The **political** objectives refers to the attempt to change the structure of power in the country, and it can be the platform of liberal as well as of socialist political groups. The main **social** objective is usually ‘social justice’, because an unequal distribution of the most important resource of a country is seen as unjust by all possible perspectives. The two most important economic objectives are, reduction of absolute poverty, and increase of agricultural productivity.

**There exist several different forms of land rights :**

(**A). Private land rights**

This is the most common form of land rights in modern economies, and they include private ownership as well as usufructuary rights such as rental, leasing and sharecropping. Private owners can voluntarily decide to pool their lands in cooperatives or other forms of joint operation.

**(B). State land**

Is when the state (any local or central authority) maintains the ownership right to the land. For farming activities, what is relevant, is the security of the right to the income derived from the land, rather than the full ownership. Full ownership is related more to the role of land as a reserve of capital. For example, ownership of the land allow to use it as a collateral for access to credit, whereas rented land cannot be used for such purpose. Land tenure policies are thus aimed at establishing and maintaining security of the rights over land use.

 (C). **Communal land**

 It is similar to open access land, but access is limited to members of a specified community, and the use may be regulated by community restrictions. Usually their use is defined in customary land regimes, based on historical traditions.

**7.7. Research Policy (Technical Innovation)**

Agricultural development and improvement in levels of rural living require an innovative technology, which systematically adapts scientific knowledge to farmers. In many countries farm-level technologies superior to those currently in use are already available. Technological change is a time-consuming process and need suitability test before its implications.

Technology is not neutral. There are cases where technological changes favor the well to do farmers and exacerbated the plight of the rural poor. There is a need to develop technologies appropriate to the condition of the rural poor and improving access of the poor to the agricultural extension and supplementary inputs.