

## **ECONOMICS AND POLICY OF FOOD PRODUCTION**

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**Keywords:** Economic policy, food security, poverty, agricultural production, natural disasters, war, agricultural trade, agricultural R&D, price stabilization, subsidies, fertilizer, parastatals, food stamps, food aid, tariffs, famine, landless poor, price deregulation, trade, malnutrition, irrigation, green revolution, water scarcity, biotechnology, Malthusian theory, markets, equity, gender bias, HIV/AIDS, education

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### **Summary**

Despite decades of development efforts, poverty and food insecurity are still core problems that beset the modern world. A number of factors contribute to widespread and protracted hunger. These factors are examined, and prospects for mitigating them are considered.

Since the 1940s, governments, with the support of international agencies, have adopted various policy measures to improve food security. While there are various policy instruments that governments can and do use to improve food availability, the cornerstone of food security lies in poverty alleviation. Only thereby can there be improvement in the economic and physical access to food for the most needy. In most developing countries (DCs), where the majority of the poor live in rural areas, poverty reduction can be achieved via broad-based rural and agricultural development. For such efforts to succeed requires good macroeconomic policies that encourage long-term development and economic growth, improved technologies for food production and marketing, better infrastructure that will increase the flows of inputs and outputs and enhance the interface between rural and urban areas, improved access to resources by the poor, and investments in people to improve their capacities.

About 70% of the world's poor live in rural areas. Targeting poverty reduction in rural areas will therefore do much to reduce the incidence of world poverty and of food insecurity. Agricultural development results in increased employment in the rural sector through jobs created by the multiplier effects of increased incomes of farmers. Benefits from agricultural growth linkages are expected to flow on to the urban sector, too. Developing the agricultural sector is therefore a good way of reaching a large part of the population.

In the past, increases in agricultural production have primarily come from expansion of cultivated land as well as from agricultural productivity increases. Most of the productive land is now being utilized. Hence, future increases in food production will have to be as a result of increases in agricultural productivity.

The prospect for meeting future food demand is, however, bright. Advances in new technology, particularly in biotechnology, are offering great opportunities to increase food production and meet the food challenge. The real challenge, however, is ensuring access to food by the poor. Agricultural development therefore needs to remain high on the policy agenda.

## **1. State of Hunger and Food Insecurity**

In the second half of the twentieth century, steady progress was made in increasing per capita food availability in the world. However, despite the increase in food production, hunger and food insecurity are still major problems that beset this world. Today, there are more than 800 million people who are chronically hungry. The depth of hunger or food deficit of these people varies from an average of about 100 kilocalories per day to 400 kilocalories per day. Chronic hunger causes malnutrition, susceptibility to diseases, and poor physical condition. Hunger therefore prevents those affected from achieving their full potential. Children are the most vulnerable.

While hunger and food insecurity occur around the globe, in both developed countries and in DCs, the bulk of the hungry and food insecure are located in the developing world. The FAO estimates that about 95% of the undernourished are from DCs, with most of the chronically hungry located in Asia and the Pacific. In terms of depth of hunger, food deficit is greatest in sub-Saharan Africa, where about 46% of the undernourished suffer an average deficit of more than 300 kilocalories per person per day (see *Rural Resources and Feeding Folk Fully* and *Economics, Food, and Nutrition*).

## **2. Causes of Hunger and Food Insecurity**

Food security refers to economic and physical access of all individuals to adequate amounts of food to lead healthy and productive lives. Food security is determined by food availability and access to food and the risks associated with either food availability or access. Factors that contribute to widespread and protracted hunger include poverty, agricultural failure, ecological constraints, inadequate nutritional knowledge, poor infrastructure, poor governance, and rapid population growth. In addition, natural disasters can cause acute short-term food insecurity, while conflict can produce both short-term transitory food crises and longer-term chronic hunger. Economic problems, such as financial crises, can also affect incomes and the availability of food and therefore the prevalence of hunger in a country.

Increasing population obviously implies increased need for food. Although the global rate of population growth has slowed considerably, population will increase for a few decades in the twenty-first century. Most of this increase will occur in the DCs. In areas where land is limited or fragile, population pressure can also put considerable stress on the environment and may lead to conflict among competing users (see *World Demography and Food Supply*). Similarly, agricultural production failure and lack of arable land can lead to declining per capita food output (see *Agriculture and Global Change*).

Natural disasters also affect food production. Typhoons, cyclones, or floods can wipe out entire areas of agricultural production and bring about food shortages. Prolonged drought can cause agricultural production failure, with dire consequences for food production and supply. In some parts of Africa, for example, famine can be attributed to a combination of drought, poverty, and conflict. Conflict has a negative influence on food production, incomes, and entitlements. In war-torn areas in sub-Saharan Africa, food production has declined dramatically as compared with peace times. Conversely, while poverty and hunger was widespread in Cambodia during the years when the country was embroiled in conflict, the area allocated to farming doubled between 1980 and 1996 after conflict eased. More important, conflict leads to lack of entitlements. If people are driven off their land, they have no chance of employment and have nothing left to sell. They will starve unless helped.

If the total amount of food available in the world were evenly distributed, it would be enough to feed the hungry. Obviously, therefore, food availability does not guarantee access to food. Access to food is governed by the physical and economic capacity of families to obtain food. Only rarely is the physical availability of food such that there is too little to go around; these days food supplies can reach most places in the world

albeit at some considerable cost. Poverty is the main cause of food insecurity. Poverty and hunger go hand in hand. Because the hungry cannot function effectively, hunger is both a cause and a consequence of poverty.

Poverty is broadly defined as deprivation of well-being. It is multifaceted and encompasses deprivation of income as well as poor endowments in terms of assets such as health and education. The various dimensions of poverty tend to interact and reinforce each other. People with low income are usually those who have poor health and low levels of education. Lack of education, however, constrains them from undertaking productive and rewarding employment. Similarly, those with poor health are less well able to engage in economic activities and so have less chance of climbing out of poverty. Hence, they are trapped in poverty—unless government intervenes to break the poverty cycle.

There are about 1.2 billion people living in extreme poverty, defined by the World Bank as those earning less than US\$1 per day, or 2.8 billion, if the poverty line is shifted to US\$2 per day. Nearly 800 million of the world's poor are malnourished, some 70% of whom live in rural areas. According to the World Bank, most of the poor are located in South Asia, sub-Saharan Africa, East Asia, and the Pacific, with about 522 million located in South Asia, 291 million in sub-Saharan Africa, and about 278 million in East Asia and the Pacific.

### **3. Policies for Food Supply and Food Security**

For centuries, governments have worked toward ensuring food availability to their constituents. Various government policies have been introduced to influence the amount of food available to the populace and to tackle hunger and food insecurity. Two major paths used by governments to influence the food and hunger situation in a country are via supply-side mechanisms, which directly affect agricultural production and agricultural supply, and through the consumption side, that is tackling the problem via policies that would improve access to food by consumers. Government intervention can be through specific policies or a combination of several policies that target price stabilization, food production enhancement, income transfers, and trade controls. The following sections include a range of policy alternatives available to governments to improve food supply and food security.

#### **3.2. Conventional Policies to Improve Food Supply and Food Security**

Conventional mainstream food policies emphasized food supply and availability. The supply of food is usually largely determined by domestic food production. Food production, in turn, is affected by farm prices and costs, availability of farm inputs, resources available, such as land and water, technologies, and access to these things. Food and agricultural policies are obviously important to agricultural producers, but they also affect the welfare of consumers. Following are the most typical policy instruments used by governments to influence food supply and food availability. The discussion focuses on key features of the policies and some assessments on their strengths or merits, their weaknesses, and in some instances their inappropriateness. In assessing policy instruments, some of the guiding principles used include: first, that

there is a good match between the specific policy goal and the policy instrument; second, that the policy instrument produces the intended outcome, with low chances of failure. A third area of consideration is the nature of control. A good policy is where there is preference for incentives and facilitation over command and control. Sound policies also result in minimum distortion of resource allocation and engender minimum opportunities for undesired rent-seeking as well as having minimum incentives or opportunities for corruption. Finally, administrative requirements are also important. A modest need for administrative capacity within the scope of government concerned is considered preferable for operational purposes.

The discussion below considers separately policy instruments that directly affect producers and those that directly relate to consumers.

### **3.1.3. Policies that Directly Affect Producers**

There are several types of policies that may influence food supply availability. Some policies are geared toward agricultural product or output markets, some toward agricultural input markets and others toward markets for resources. Agricultural output or product markets are markets through which food products are processed and marketed for consumption. Policies that influence output markets include policies that affect the quantity of food supply to markets, policies that affect product prices, and policies that influence marketing and trade.

Input markets are where inputs used in agriculture such as seed and fertilizer are made available to produce food. Input policies are designed to influence the prices and delivery systems of variable inputs used in agricultural production. Policies that affect the input market include those that directly influence availability and price of agricultural inputs. For example, governments may subsidize the prices of fertilizer at less than full cost. Competition policy can strongly influence the prices farmers pay for their inputs.

Policies that affect markets for resources such as land, labor, and capital also affect food availability. Resource markets refer to markets for commodities that typically provide a flow of services such as land, labor, and capital. Policies that influence resource markets include those that target land reform, the labor market, capital including credit, and irrigation policies.

*Input Subsidies.* One supporting mechanism aimed to help farmers improve productivity is subsidies of farm inputs. Subsidies also serve to reduce costs of certain inputs thereby enhancing producers' gross margins. One of the most common examples of such a policy mechanism is fertilizer subsidy. Many of the high-yield varieties require the use of complementary inputs. Without them, productivity increases will not reach optimum levels. In many DCs, inefficiencies in the marketing system, lack of infrastructure, and certain trade policies could result in high fertilizer prices, making them unaffordable for small farmers. To compensate for these factors, governments may offer fertilizer subsidies to make inorganic fertilizer more easily available to farmers at affordable costs. Fertilizer subsidies have been widely used in DCs in Asia, Latin America, and Africa. Because of the importance of the use of fertilizers as a complementary input to

high-yield varieties, farmers were encouraged to purchase fertilizers. Experience has shown that farmers who have access to fertilizers and other inputs are able to attain higher yields and productivity levels.

Input subsidies can also come in the form of tax exemptions such as fuel tax exemptions or preferential interest rates, common in many developed countries such as Australia, Canada, the US, and the EC. Another type of input subsidy is subsidy on transport. This is also common in developed countries.

Input subsidies directly affect profits and income of producers (hence are sometimes classified under income support). The effect of this type of subsidy may however differ between countries. In most instances, subsidies have the effect of altering relative input prices and may distort the pattern of resource allocation within the agricultural sector. Moreover, input subsidies, while not always involving budgetary outlays (as in the case of tax concessions) can be a drain to government budgets and therefore generally may not be sustainable in the long run. However, input subsidies are known to have an output enhancing effect. In some resource-poor countries, input subsidies enable farmers to use otherwise unaffordable inputs such as fertilizers and to achieve higher agricultural production. Fertilizer subsidy was a common tool used by governments to support farmers in the 1970s and 1980s. Since then there has been a move by governments to remove fertilizer subsidies. In some countries such as in some African nations, there are fears that the removal of fertilizer subsidies will lead to reduced use, consequently eroding previous productivity gains.

*Buffer Stocks.* Another area of government support is price stabilization. Farm incomes and farm prices can be unstable. Fluctuations may arise as a result of variations in demand and variations in supply of food commodities. To stabilize prices, one mechanism used by governments is buffer stocks schemes. Under buffer stocks schemes, a government agency (or a parastatal) buys supplies when the demand is low, and then releases the stocks during periods of shortages or when demand is high. The intention is to reduce fluctuations and stabilize commodity prices. Sales are taxed in times of high prices, and prices are subsidized in times of low prices.

Operationally, there are some difficulties with such schemes. First, various administered prices need to be set and managed. Buffer stocks schemes require a government agency or parastatals to administer prices and to buy and sell the agricultural commodities. Timeliness is also important as success of buffer stocks is highly dependent on timely buying and selling to effectively influence decisions of traders and producers. There must also be adequate funds to finance the purchase of the commodity during surplus periods. Experience in rolling over stocks is also critical to avoid losses and spoilage. Buffer stocks schemes can only work for products that are able to be stored with little deterioration at low cost. Hence, generally, buffer stock schemes are feasible only for storable commodities such as rice, wheat, coffee, and cocoa.

While these schemes present a mechanism for stabilizing prices and establishing food security reserves for periods of production shortfalls, the history of buffer stocks schemes has been dismal. Moreover, the evidence that there are any macroeconomic benefits is weak and contradictory. Farmers inevitably get reduced average prices due to

high operational costs, and the schemes typically fail when most needed—when there are prolonged and/or severe price falls.

*Price Support.* Governments may intervene to influence the price of commodities directly via price support mechanisms. Farm price support is a form of price regulation by which the government seeks to assure farmers a minimum price for their produce. The main objective of price support is to support the income of farmers. Farm price support has also been a common mechanism used by governments to entice farmers to increase agricultural production. In the past, price supports have been introduced when there is a threat of food shortage or when the state wants to build up stocks.

Price support involves setting a minimum price level received by farmers above the market equilibrium level. In practice, they depend on either excluding or taxing competing imports for net importing countries, or subsidizing exports. Such schemes have both direct and indirect effects; directly, through the price control of targeted commodities, and indirectly to other commodities that utilize the commodities being supported. For instance, poultry and eggs may not be supported directly, but support programs on corn could influence their input prices.

Price supports in some form have been maintained in both developed countries and in DCs, but mostly in developed ones. Decisions to maintain price support mechanisms are largely influenced by political considerations. In developed countries, such as the US, where farm lobby groups can be quite powerful, there is strong pressure to maintain price supports in one form or another.

Such schemes are relatively easy to administer in countries where a monopoly marketing system is in place. They could, however, be expensive ventures for governments, and their success will depend on the government's ability to defend the farm support price. Moreover, such schemes are likely to be severely distorting of resource use. From an economic viewpoint, the cost to the government is not a major consideration because it is a transfer payment. However, the real resource costs can be considerable. A further problem with price support schemes is that they can have distortionary side effects. For example, price support, mainly in Europe and North America, has had a distorting and damaging effect on world agriculture—notably in DCs producing products competing with subsidized production. The effects are manifested through reduced access to markets and increasing competition in global markets at depressed and unstable prices.

*Income Support.* The vagaries of nature and the inherent riskiness of agricultural production make farm incomes quite unstable. To counter income instability, governments may institute farm income supports. Apart from income stabilization, the objectives of farm income support are to enable farmers to achieve equitable incomes comparable to the nonagricultural sectors and to reduce income disparity within the agricultural sector. Another oft-cited objective, particularly in developed countries, is to provide incentives to farmers to remain in agriculture and thus reduce migration out of agriculture.

Income support can come in the form of direct transfer payments or crop insurance programs. In some OECD countries, domestic budgetary pressure and international policy commitments have led to the erosion of the traditional focus on price support schemes. There is an increasing push toward direct payments instead of price support mechanisms for farmers.

Direct income payments are sometimes considered a better option than price supports by governments because direct payments bring domestic prices more in line with export markets. To compensate for the loss associated with the withdrawal of price supports, farmers are directly paid an amount that will bring total compensation in line with designated support levels. The advantage of this scheme is that farm incomes will continue to be supported, storage stocks could be reduced, and international trade will be boosted. This scheme is also easier to administer than price supports and buffer stocks schemes, but can also be expensive.

Crop insurance programs, on the other hand, are designed to protect farmers' income from severe fluctuations. The role of the latter is to reduce the risks farmers face in cases of crop failure or extremely low prices. Government support comes in the form of some crop insurance subsidies. However, crop insurance is an uncommon mechanism in DCs, particularly with poor farmers as the farmers normally shoulder the main cost. Again, the history of crop (mainly yield) insurance in developed countries has been dismal. The feasibility of such programs is threatened by problems of adverse selection, moral hazard, and the highly correlated nature of farming risks.

*Trade Policies.* Trade policies generally relate to restrictions governments implement on imports or exports of a commodity to alter the national food supply and to drive a wedge between world and domestic prices. The restriction can be in the form of a trade tax or a trade quota. For example, if governments want to restrict the amount of food imports coming into the country (for instance in pursuit of self-sufficiency goals), they could impose a tariff or import tax; or alternatively, a quantitative restriction or import quota may be imposed. Such mechanisms will limit the quantity imported and raise the domestic price above the world price. Favorable farm prices could then encourage farmers to increase food production, and thus help achieve a country's food self-sufficiency goal.

Trade policies are also used to raise prices to increase the incomes of domestic producers. For instance, some developed countries adopt protectionist trade policies that impose trade barriers against imports by imposing import tariffs or quotas, or by providing subsidies to exports. The effect will be to drive the price level up to the benefit of producers. In this situation, consumers lose. Such policies occur when farmers' concerns over low prices and foreign competition outweigh price concerns by consumers.

In principle, an increase in the domestic production of a traded food will lower its price. However, trade restrictions on imports or subsidies on exports can offset the price effect to the benefit of farmers who are net surplus producers. On the other hand, expanding imports or restricting exports can increase the supply of traded food. Exports can be limited by imposing either a per unit export tax or an export quota. The effect of such a



policy is to push down domestic prices and decrease domestic production. Lower prices will encourage poor consumers to increase their food consumption. The effect of such policy will depend on who the poor are. The poor will benefit if they are net buyers of food. On the other hand, low-income farmers who are net sellers of food will suffer, while subsistence farmers will be affected minimally.

Obviously, using trade policies to influence either the price or quantities of food availability is only applicable to tradable commodities. In some instances, trade restrictions may benefit the budget. For instance, import and export taxes benefit the treasury. The effectiveness of trade policies for food security however, will depend on the nature of the food insecure. A trade policy that increases national food supplies and lower food prices is an effective way to enhance food security if the poor are primarily net buyers of food, such as when urban poverty is widespread. However, if the poor are net sellers of food, food security may be improved by increasing food prices instead.

Trade policies are generally implemented to fulfill domestic policy objectives. However, they may also generate wider effects. For example, protectionist policies of some developed countries have adverse effects on world food supplies and at times impede the efforts of DCs to increase agricultural production. The increasing trend toward trade liberalization is expected to alter these wider effects, the net benefits (or costs) of which depend on the nature of commodities traded and whether a country is a net exporter or a net importer.

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**Maria Fay Rola-Rubzen** graduated from the University of The Philippines in 1986 and completed her Ph.D. at the University of New England in 1998. She has extensive experience in developing-country agriculture in development projects and consultancies. She worked with the Center for Policy and Development Studies, University of The Philippines at Los Banos, the University of New England, and is currently with Curtin University of Technology. Areas of interest include agriculture and rural development policy, poverty reduction, socioeconomic impact of rural development policy, farming systems analysis, marketing and credit systems in DCs, gender analysis and decision analysis under risk and uncertainty.