

# **SUSTAINABILITY OF FOOD PRODUCTION AND FOOD SECURITY IN A FREER WORLD MARKET ECONOMY**

Faisal Kasryno  
Agency for Agricultural Research and Development (AARD),  
Ministry of Agriculture, Indonesia

## **SUSTAINABLE FOOD PRODUCTION, FOOD SECURITY AND SELF-SUFFICIENCY**

According to the Oxford Advanced Learners' English dictionary, sustainability means "keeping an effort going continuously, the ability to last out and keep from falling". Sustainability in food production can therefore be defined as the ability of food systems to keep production and distribution going continuously without any marked interruption. It implies the ability to sustain the growth of food production to meet the demand for food in the future.

This definition covers a number of aspects, including technical, economic, social and political as well as environmental ones. There are many other definitions, but I will not spend any further time trying to clarify them because they are all essentially abstractions. I should prefer to discuss closely related concepts, namely food security and food self-sufficiency.

Discontinuities in the food supply impose severe costs at several levels. At the household level, especially in production systems where many families live by a subsistence economy, discontinuities in production threaten the nutritional status of both rural people and the poor among the urban population, and tend to increase inequality in the distribution of wealth and income. At the community level, discontinuities in the food supply and growth in food production have a differential effect on local communities within the context of agroecological zones. At the national level, they may adversely affect the nutritional status of citizens, disrupt the earning of foreign exchange from agriculture, and frustrate national efforts to exploit comparative advantage. In addition, they create great uncertainty, which in turn means that levels of agricultural investment are lower than they would otherwise have been.

Many economists have recognized that world price instability and uncertain availability of food imports impose costs to a country's economy, and have recommended that developing countries should

implement policies that increase food security. Steven and Jabara (1988) emphasize that food security policies are concerned with stabilizing available food supplies from a variety of sources, rather than from increased domestic production alone, as a means of reducing the effect of import supply disruptions on prices and food consumption. Food security policies also recognize that shortfalls in domestic food production can result in increased volumes of imports and thus higher import costs.

The sharp increase in food prices that occurred in the early 1970s encouraged many countries to implement policies that increased domestic food production, in order to promote food self-sufficiency and reduce food imports (USDA 1983). Self-sufficiency in its basic sense means that domestic production meets the level of food consumption. Self-sufficiency is only one way of achieving the broader objective of food security, which is basically concerned with adequate and stable supplies of food. Alternative approaches to food security include holding stocks, long-term contracts for food supplies from other countries, and direct investment in food production overseas (Trewin *et al.* 1992).

Indonesia was one of several Asian countries which launched a rice self-sufficiency program in the early 1970s. Self-sufficiency in rice, the staple food, has been justified both economically and politically. Up until the present, rice self-sufficiency has remained a primary concern of government policy, although there has been some flexibility in that a certain level of imports was allowed in years when there was a production shortage, usually the result of drought, and exports in other years. One valid argument in support of this goal is that Indonesia is a monopsony power in the world rice market – it is the single buyer from a large number of sellers. This means that self-sufficiency tends to be cost-effective. A "small country" assumption is usually applied in assessing the domestic effects of trade. This implies that a country is subject to influence, but is unable to influence the situation in the rest of the world. In other words, it faces an infinitely elastic export supply curve. This assumption may

not be appropriate for Indonesia, particularly in the case of rice demand. Indonesia is such a large country (the fourth largest in the world) that the world market price of rice is likely to increase if there is a high level of demand for rice from Indonesia.

Self-sufficiency in staple foods becomes less relevant as development progresses, and the issue then becomes more one of nutritional self-sufficiency. The Indonesian government has now adopted a policy of agricultural diversification, not only for income and employment generation, but also to promote the development of agribusiness. It is widely felt that diversification of agriculture, including food production, is one way of sustaining growth in the rural economy. Income from farming depends on output prices, input prices and yields. When input prices and yields are relatively stable, any instability in farm income is the result of fluctuating prices for produce. The emergence of crop surpluses, as was the case for rice in 1986, can force prices down sharply, pressuring farmers either to grow other crops or to leave the farming sector completely. In this situation, agricultural diversification becomes an important non-price program, and a vehicle for alleviating economic instability in rural incomes.

## **THE GATT AGREEMENT ON AGRICULTURE**

Up until now, the world market for agricultural products has been distorted as a result of strong intervention from national governments. Some have even argued that the instability in world market prices for agricultural products is largely due to this intervention.

The GATT agreement has finally been reached after years of negotiation. With this agreement, the world market economy is expected to move away from uncertainty, instability and conflict towards openness and cooperation. The main problems are now related to the question of whether the agreement can be implemented smoothly and consistently. The following is a brief summary of the GATT agreement on agriculture\*.

There are four main sections: the agreement on agriculture itself; concessions and commitments concerning market access, domestic support and export subsidies; sanitary measures; and the Ministerial agreement concerning Least-Developed and Net Food-Importing Developing Countries.

With regard to market access, non-tariff measures are replaced by tariffs that provide substantially the same level of protection. Tariffs resulting from this process, as well as other tariffs on agricultural products, are to be reduced by an average of 36% in the case of developed countries and 24% in the case of developing countries. Reductions are to be undertaken over six years in the case of developed countries, and ten years in the case of developing ones. Least-developed countries are not required to reduce their tariffs. Domestic support measures that have a minimal impact on trade (green box policies) are excluded from these commitments. Such policies include general government services for research, disease control, infrastructure and food security. It also includes direct payments to producers, for example certain forms of income support, assistance in structural adjustment, and direct payments under environmental and regional assistance programs. Also outside the agreement are subsidies to reduce the cost of marketing agricultural exports, or internal transport and freight charges for export shipments.

The GATT agreement recognizes that governments have the right to take quarantine precautions, but stipulates that these measures should be applied only to the extent necessary to protect the health of human beings, animals or plants. They should not discriminate between members where similar conditions prevail. Members are encouraged to base quarantine measures on international standards and guidelines.

It is recognized that during the period of adjustment, developing countries which are net food importers may experience negative effects. A special decision sets out objectives with regard to the provision of food aid, and aid for agricultural development. It refers to the possibility of assistance from the International Monetary Fund and the World Bank for short-term financing of commercial food imports

## **SUSTAINABILITY OF RICE PRODUCTION IN INDONESIA**

Overall, the GATT agreement suggests that each country should focus on the production of commodities in which it has a comparative advantage. The agreement obligates member countries to reduce any barrier to trade, both tariff and non-tariff. The only way for countries to survive in this more competitive world market

\* This section draws heavily from Focus - the GATT Newsletter, No. 104, December 1993.

situation is to improve their competitiveness, by acquiring better technology to increase their efficiency. Thus, "efficiency" in a broad sense must be one of the main principles each country must work with, in order to sustain agricultural development in general and food production in particular.

The Indonesian government has been working to pursue this objective. It has recognized that there were high costs associated with achieving rice self-sufficiency through direct market intervention with its price and subsidy policies. Expenditure on the fertilizer subsidy continues to increase, despite the government's efforts to phase the subsidy out. Other costs of the subsidy include a possible loss of economic efficiency, welfare costs and environmental damage from excessive fertilizer use.

Increasing fertilizer use efficiency is very important. Not only will it reduce the total use of subsidized fertilizer and hence the cost of the subsidy, but it will also reduce the production costs borne by farmers. Substantial savings in the use of fertilizers can be realized by measures such as adjusting fertilizer recommendations to suit local conditions, and through more efficient techniques of fertilizer application.

### **Increasing Efficiency Use of Phosphate Fertilizer**

The use of phosphate (P) fertilizer provides a concentrated form of phosphate with a high residual effect that builds up in the soil. Applying triple superphosphate is thus a kind of soil enhancement which need not be continued indefinitely with every rice season. Reduction and reallocation of phosphate fertilizer use are key elements in a long-term strategy for the efficient utilization of fertilizer.

Triple superphosphate (TSP) is the principal phosphate fertilizer used in Indonesia. According to phosphate maps prepared by the Soil and Agroclimatic Research Center of AARD, 39.7% of rice fields in Java are in a high P-status category, 45.4% in a medium status, and only 14.9% in a low P-status category. In experimental trials in 22 locations in Java, there were no significant differences in rice yield with different levels of TSP application in nearly all areas, including those with a relatively low P-status. Very similar results have been found in trials carried out outside Java, in South Sulawesi and other areas. On the basis of these trials, AARD recommends that Indonesian farmers use 50 kg/ha of TSP every four planting seasons in high P-status areas, 75 kg/ha every two

planting seasons in medium P-status areas, and 125 kg/ha every planting season in low P-status areas.

This is less than the levels recommended by the Ministry of Agriculture (50-75 kg/ha in high-P areas, 75-125 kg/ha for intermediate P-status soils, and 125 + kg/ha for low P status soils, for each planting season). It is much less than the actual application rates in most of Java, which are often well over 100 kg/ha/season. It therefore appears that TSP consumption can be reduced by more than 25% without any adverse effect on rice yields.

### **Increasing Efficiency of Urea Fertilizer**

At least a third of nitrogen (N) applied by current methods in the form of prilled urea is lost by volatilization or leaching. The greatest potential for improving the efficiency of urea use at a farm level lies in improved techniques of application, particularly the deep placement of urea into the soil. Urea tablets and briquettes offer a convenient form of nitrogen for deep placement. The available agronomic evidence shows that this deep placement of urea tablets or briquettes results in higher rice production and lower urea use, compared to the more common broadcasting method. Indonesia's urea tablet program began in the 1991/92 wet season, when government agencies demonstrated their farm-level use of urea tablets in 15 districts in Java. The current national program of urea tablets is planned in three phases, and covered 45 districts in the first phase of the 1993/94 wet season.

### **Policies for Food Security and Self-Sufficiency**

According an FAO study in 37 developing countries (FAO 1985), the need to stabilize food prices in order to help farmers in production planning and ensure the availability of food supplies to consumers at stable prices (food security) has had a major influence on agricultural policies in developing countries. In addition to ensuring stable prices, some governments have raised producer prices above market equilibrium in order to increase production for food security stocks or to achieve food self-sufficiency. In the case of Indonesia, stabilization of rice prices is a major policy instrument, although it is clearly not satisfactory as the sole instrument to achieve food security (Afiff 1993). The main debate has been whether self-sufficiency in rice is the best approach to food security, and the impact of self-sufficiency on price stability. Rice surpluses in

1985 and 1986 stimulated policy attention to diversification of production away from rice, but deficits in 1987 and 1988 renewed concern over Indonesia's capacity to produce enough rice to meet domestic demand.

Will pricing and stabilization schemes still be relevant policy instruments in the future, when the GATT agreement is fully implemented? It is obvious that each member country no longer has the freedom of previous years. Price and stabilization policies will have to be used in a more restricted manner. This is in fact consistent with Timmer's contention (Timmer 1991) that 'getting prices right' is not the same as free trade at world market prices, since additional considerations such as instability of world prices have to be taken into account. He describes what he calls the 'stabilization' approach. This contends that efficiency is maximized if intervention is used to stabilize short-term prices, but that domestic prices should reflect longer-term trends in world prices. Thus self-sufficiency remains a relevant policy target and would fit in with the stabilization approach if domestic prices are set at a level which reflects long-term world price trends.

Building rural infrastructure, especially transport and communication systems, is essential so that agricultural producers can receive both inputs and efficient price signals from consumers, and transport their surplus to market. Most of this infrastructure is a public good for which the government should be responsible. Public investment of this kind is essential to sustain agricultural development in general and food production in particular, and provide the basis on which a market economy can operate.

### CONCLUSION

The GATT agreement on agriculture is likely to have a considerable effect on food production and food security in developing countries. It is not clear what the impact of some sections of the agreement will be. On the one hand, the agreement provides a framework for the long-term reform of agricultural trade and domestic policies in the years to come. It makes a decisive move towards an increased market orientation and free trade, and a climate of improved predictability and stability in which both importing and exporting countries can pursue their national goals. On the other hand, the agreement restricts member countries in setting their domestic agricultural policies in ways which may or may not be consistent with their national

objectives.

The concept of food security is well suited to this situation. Food security is concerned with stabilizing available food supplies from a variety of sources, rather than from increased domestic production alone, as a means of reducing the effects of disruptions in the supply of imports on prices and food consumption. Food self-sufficiency in its most basic sense means that domestic production satisfies consumption needs. Self-sufficiency is only one way of achieving the broader objective of food security.

To survive in the more competitive world market after the GATT agreement, each country must improve its competitiveness by acquiring better technology to increase efficiency. Thus, "efficiency" in a broad sense must be one of the main principles for each country in order to sustain agricultural development and food production.

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## DISCUSSION

Dr. Mutert of the Potash and Phosphate Institute, Singapore, noted that cassava consumption in Indonesia is declining, and reminded the meeting that Dr. Saleem Ahmed in an earlier paper presentation had recommended a greater emphasis on non-cereal crops, since many root and vegetable crops make more efficient use of land and fertilizer. This fall in cassava consumption might therefore be seen as a move away from sustainability. Dr. Effendi Pasandaran agreed, and pointed out that the consumption of imported wheat is also increasing, but that it is very difficult to change this trend. The decline in cassava consumption reflects the higher incomes and improved diet of the Indonesian people.