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# Food security and sustainable agriculture

Dr Kalim Siddiqui

**B**y food security we mean here that all people need to have enough food for an active healthy life. Food security is a necessity and should be regarded as a basic human right. But still many million go hungry, despite the fact that the world produces enough food for everybody to have more than adequate diet. This is a paradox that the people go hungry, while some parts of the world produce massive food surpluses, much of which is fed to livestock. Two-thirds of the people who go hungry are in South Asia and a fifth in sub-Saharan Africa, and the majority live in countries with very low average income.

Being enough to eat is not only a question of overall production or the average amount of food per head of population, although total production is obviously important. It is also about distribution at household, region, national and international level. At the household level, it is matter of being able to grow food, or having money to buy it. For poorest people surviving on the margins, often without land or source of income, environment or economic shocks can suddenly undermine their capacity to feed themselves. Poor people face starvation when they are totally deprived of food; but many poor people are regularly hungry because they do not have access to enough food each day. Food security at household level can be a matter of gender also. In India, for example, nearly half of the country's households cannot provide for their nutritional requirements, so many children are deprived. However, malnutrition is far more prevalent among girls than boys, a situation which continues into adulthood.

At the national level, food security means self-sufficiency in production, or exporting enough goods to acquire foreign exchange to pay for food imports. Poor countries face food insecurity if their agricultural systems fail or if their export cannot pay for the food imports they are seeking to provide for their food requirements, the poorer Third World countries face formidable obstacles. If they are not food self-sufficient and rely on imports, they are exposed to the vagaries of the international trading system. It is one thing to depend on the export of competitively priced manufactured goods, especially where food self-sufficiency is clearly impossible (as in the case of Taiwan, Hong Kong or Singapore); quite another to be dependent on agricultural commodities whose prices are fluctuating on a downward trend (as Ivory Coast, Zambia, or Rwanda). FAO (United Nations' Food and Agriculture Organisation) has identified 65 low income food-deficit countries which are potentially vulnerable at present, many of which have not been able to increase domestic food production.

But even where Third World countries have the purchasing power to import food to meet their domestic requirements, there are uncertainties in relying on global surpluses. The present pattern of surpluses may not continue. Production decisions in the main surplus-producing countries, over which the

varieties had exceptional potential for higher yields if provided with high inputs of chemical fertiliser and water. However, Green Revolution technology is especially suitable for the best agricultural land which is fertile and has enough water supply. The technology has little to offer farmers in low-potential areas such as arid and semi-arid areas of Africa or those farming steep slopes with poor soils.

However, though food production was increased, the benefits have been rather unevenly distributed, partly as a result of disregarding the social and economic context into which the technology was introduced. The small farmers have often lost out because they were not able to afford the inputs needed for the new varieties to thrive. Those who could afford the whole package of inputs did well.

In India, the impetus for Green Revolution technology derived partly from the failure in implementing land reforms in India. Increased production was seen as a way to increase food production without recourse to land redistribution which was strongly opposed by the landed classes. The majority of India's farmers are poor subsistence farmers involved in rain-fed agriculture. For the most part, the Green Revolution has not helped them. It has been argued that emphasis on wheat and rice has neglected in production of pulses, oilseeds and other cereals which are important to the diet of poor people.

There have also been heavy costs in environmental terms. India has lost vast areas of prime agricultural land because of salinisation and waterlogging in irrigated areas. Intensive monocropping has made crops vulnerable to pest problems and the overuse of pesticides has given rise to widespread environmental and health problems. Large quantities of fertilisers are needed for the high-yielding varieties of plants grown and can leave water supplies contaminated with nitrates. Use and knowledge of traditional plant varieties and techniques has been lost.

The conversion of rainforest to farmland accounts for more than half of all deforestation in tropical areas. Movement of settlers into forest areas can reflect an official policy to expand agriculture or to resettle the people. In Latin America and South Asia, large areas of land are often owned by small minority, and this inequitable distribution of land has brought new demands for the conversion of forest to agriculture. In Brazil, for example, migration of poor settlers into forest areas has been officially encouraged in the absence of more fundamental land reform. Forest land is also cleared for large scale agriculture to produce crops for export, often because of an urgent need for foreign exchange. Forest have been cleared in Malaysia for rubber and palm plantations, and in Thailand thousands of hectares of forest have been cleared to grow cassava which is turned into tapioca for export to Europe as animal feed.

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Third World has no control, can affect the volume of cereals coming on to the world market. If climate changes take place as predicted, there could be serious negative effects on the main cereals of North America and areas such as the Sahel and South-East Asia, which are presently vulnerable to drought or floods could suffer further.

Grain is a big business. In 1990, about 190 million tonnes were traded internationally for about \$50 billion. Before the war, the volume of grain exported seldom exceed 30 million tonnes mark a year. So growth of trade had been rapid. Production for the international market is concentrated in the most powerful nations, also known as developed countries like the United States account for around 50 per cent of the world grain exports. Finally, the trade is dominated by a handful of world's largest multinationals: Cargill, Continental, Louis Dreyfus, Bunge and Andre.

Lester Brown of America's World Watch Institute argues that, within 35 years, China's demand for grain will far exceed its own production capacity, and gobble up the surpluses in West Europe and America. He predicts that China will be importing huge quantity of grain and it would drastically reduce the world's surplus grain and there will not be enough for other Third World countries. It might ultimately result in rapid price increase of grain in global market. According to Chinese statistics, China imported 6.4 million tonnes of grain in the first six months of this year, up from 3.3 million tonnes last year. The bulk of this import came from the US, Canada and France. It is said that the percentage of grain-intensive animal proteins in the national diet will continue rising. Brown says that by 2030, China and its livestock will be consuming some 750 million tonnes of grain each year. At the same time, it is largely accepted that domestic grain production will decline sharply and the crop land is rapidly disappearing. More than 700,000 hectares of cultivated land were taken by construction during the past year. Increasing industrialisation will also divert scarce water supplies from field that already suffer drought in many areas of the country.

Therefore, keeping above insecurity in food supply, it appears that for the most vulnerable countries, a considerable degree of self-sufficiency in food production is not only desirable but a necessity. But the efforts of vulnerable countries towards achieving such objectives are often hampered by both the international system and difficulties at national level. A major problem is the dumping of cheap food produced in the West as a result of subsidies and income support for the farmers. This is definitely at present undermining Third World's farmers production of food staples by depressing local prices, while, at the same time, urban people benefit from, and acquire a taste for, cheap imported food.

In the early 1960s, the concern about food was largely about the need to increase total production. Development thinking at that time concentrated on growth as a way of alleviating poverty, hoping that the wealth created would 'trickle down' to the poor. Increased food production was seen as a way of overriding some of the problems of uneven distribution within the countries.

Increases in food production in the Third World countries since the 1960s have been achieved largely because of Green Revolution technologies subsidised by the state. The Green Revolution means a set of technologies which included the introduction of semi-dwarf wheat and rice varieties, initially produced at Mexico and Philippines. These

Clearing the forests for cattle ranching is not based on sound and long-term economic policies. For example, cattle pastures are able to sustain only for a short periods - they rarely last more than eight years before they must be abandoned. Conversion of forest to cattle ranching is only economically viable because landowners are given tax incentives and land is given to them almost free. Subsidies and incentives has encouraged land speculation and the conversion of Brazil's forests to cattle pastures. An important step towards reducing deforestation would be agrarian reform, including secure, recognised and visible rights to land, together with access to credit and technical help if needed for the poorest people. This would make it possible for small land owners to stay instead of being evicted by more powerful landed interests.

Ecosystems consist of an association of living things like soils, water, climate, trees and slope. They are highly complex and diverse, self-regulating and sustainable and if not disturbed, have a built-in equilibrium. Agriculture transforms ecological systems to meet human needs for food fuel, fodder and fibre by promoting the cultivation of certain plants and animals. Sustainable agricultural systems are those which are able to maintain their productivity, stability and equilibrium. Ecological relationships can be used to make agricultural systems more sustainable, for example, agroforestry (mixed plant/tree cultivation), intercropping, rotations, green manuring, etc. Agricultural systems which mirror diversity of natural systems are more resilient than monoculture. The risk is spread amongst the crops and harvests are spread throughout the year and over the longer periods.

By contrast, modern agriculture in the West and also the Green Revolution in the Third World, have relied on systems of monocropping which, in order to be productive, have called for high inputs of fertilisers, pesticides and capital-intensive modern technology. With substantial economic resources, these systems have maximised productivity. Yet they have often been costly in terms of depletion of soil fertility, water pollution, and it is also difficult to keep the high levels of productivity for the longer periods. Environmental problems resulting from over-intensive cultivation is now more observable.

Sustainable agriculture is not just about survival now, but in the longer term. It is about systems which are productive, stable and equitable now and in the future too. The Western agricultural systems have been productive and profitable in the short term but are looking increasingly unstable and inequitable. It is generally accepted that the United States agricultural policy, which has produced massively but at great cost, must be dismantled and replaced with a system which is more financially and environmentally sustainable.

Increased self-sufficiency in the Third World through sustainable agricultural systems is away of working towards better food security. A dual strategy could be adopted, aimed first at further increases from high potential land (which is fertile, irrigated, flat and can produce surplus food), and secondly at the marginal lands which may be rain-fed, less fertile and hilly. This marginal land can be highly productive, if the right techniques are used in the right social and economic context and the most important, if the local people are involved, then productivity can increase dramatically.

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