

Original Article

Section 1

Achieving household nutrition security in societies in transition: An overview

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The achievement of nutrition security at the household level involves adequacy of food supply at the national level and equitable distribution of food among the population in accordance with their physiological needs. The emergence of globalization and market liberalization and the increasing power of some transnational corporations that are advocating pharmaceutical shortcuts have raised concerns in many developing countries. In order to achieve adequacy of food production, earlier mistakes (such as a reliance on unsustainable new technologies) need to be corrected and the resultant imbalances with respect to food production need to be reversed. Emerging new technologies, including genetic modifications, need to be effectively harnessed and adapted with due consideration to safety and sustainability. There is a need to collect convincing evidence of the efficacy and safety of genetically modified foods before they can gain general public acceptance. Information technology will play an important role in future programmes of food production and developing countries must strive to achieve access to this technology. There is considerable scope and need for the expansion of agro-based industries in villages and townships. This could create job opportunities and could also lead to better production and more effective utilization of local food resources by the community and reduce the present considerable loss of perishable food items. Household nutrition security means more than avoidance of chronic starvation. Policy makers of developing countries should set, as their target in the next century, the achievement of adequate nutrition rather than mere survival.

Key words: development, nutrition security, transition.

Introduction

The achievement of nutrition security at the household level involves the fulfilment of two essential requisites, namely adequacy of food supply at the overall national level and equitable distribution of food among the population in accordance with their physiological needs. It is apparently the latter requirement that has often proven the more difficult to fulfil. According to FAO, in every continent (except Africa) the relative adequacy of food improved substantially between the 1970s and 1990s, yet the energy consumption by the poor has not increased and more than 800 million people remain chronically undernourished. The present paper examines some of the key issues and strategies that are required to attain food security for all.

Achieving food adequacy at the national level

The need for an augmentation of food production and availability at the national level in developing countries cannot be over emphasized. In India, for example, the normal growth rate in agriculture had declined from 3.3% in the 1980s to 1.8% in the 1990s, while the population is still growing at a rate of approximately 2%. If India has to avert the need to import substantial amounts of food once again in the next century, as had to be done in the past, a significant sustained increase in food production needs to be achieved. This is true of practically every developing country.

Apart from population growth (see Table 1), the progressive emergence of a relatively affluent middle class with greater purchasing power and increasing urbanization are leading to higher per capita requirements for food. At the same time, the green revolution, which has helped to keep Malthusian fears at bay since the 1960s, has been showing signs of fatigue and the ecological foundations of agriculture are steadily being eroded in several developing countries as a result of faulty agricultural practices.

Policy considerations

Globalization

The emergence of globalization and free trade and the increasing power of some transnational corporations have raised concerns and doubts as regards the strategy that developing countries have to adopt in order to achieve augmentation of their food production. Globalization of markets does not, unfortunately, mean globalization of incomes. Globalization, while contributing to economic growth at the macro level, has tended to aggravate income disparities between and within countries. A policy of 'survival of the fittest' can

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Table 1. Projected demographic trends, 1997–2015

Region	Population (in millions)		Increase in population
	1997	2015	
Asia			
South Asia	1340.3	1737.0	396.7
South-east Asia and the Pacific	501.1	629.0	127.9
East Asia (including China)	1299.0	1479.8	180.8
Arab states	252.4	365.1	112.7
Total Asia	3392.8	4210.9	818.1
World	5743.7	7040.2	1296.5

Data from UNDP Human Development Report 1999.¹

be justified where there is a level playing field. In situations where more than half of humankind is at a disadvantage because of historical circumstances, such a policy must inevitably lead to a further polarization of haves and have-nots; unfortunately, this is already happening.

The *United Nations Development Programme (UNDP) Human Development Report 1999* pleads for ‘globalization with a human face’.¹ The report argues that while globalization may offer great opportunities for human advance, it is also ‘... creating new threats to human security, in rich countries and poor’.¹ Thus, globalization presents a formidable new challenge to poor countries. The need for strong national governance that can resist global pressures in national interests and that will ensure correct social policies has now become even more acute than ever.

Agriculture not only provides food, but also livelihood and jobs for a large proportion of populations of developing countries. For example, 65% of India’s population is dependent on agriculture for its livelihood and agriculture is still India’s major ‘industry’. The right strategy for developing countries is to accord priority to local production of adequate quantities of staple foods nationally and to avoid dependence on imported food. The millions of farmers running small and medium-sized farms must be provided with the necessary incentives for this purpose. Such a strategy will: (i) reduce the strain on scarce foreign exchange resources; (ii) lead to self reliance; (iii) provide employment opportunities for large numbers of people and, thereby, contribute to their income-generating capacity; and (iv) reduce urban migration and the proliferation of unmanageable urban slums.

Free trade

Staple food security should not be allowed to be governed by free trade regulations that are part of the new world economic order. In fact, the World Trade Agreement permits countries to impose non-tariff barriers based on considerations of ecological and food security. Swaminathan² has forcefully argued in favour of developing countries adopting a precautionary non-tariff barrier package ‘... to safeguard the livelihood-security of the rural and urban poor and the ecological security of their countries’. He has urged countries to review the ‘... food security clause for restricting imports of food and dairy products based on a careful study of their potential impact on the livelihood security of the poor’. Developing countries should, by and large, opt for a shift away from export-orientated food production policies to policies of ‘more local production for local use’ in order to provide increased employment opportunities for the rural poor.

Recent global trends also seem to favour large-scale capital-intensive monoculture against smaller labour-intensive multicrop environmentally friendly agriculture. The same trends also favour the abolition of farm subsidies that could aid the rural poor. These trends need to be resisted by poor developing countries. It must not be forgotten that in developed countries large amounts of public funds have been, and still are, invested in improving rural and agricultural infrastructure, such as roads, communication, electricity, transport, storage and post-harvest technology. In contrast, investments by developing countries in these areas are relatively insignificant; this is particularly the case in areas such as horticulture, animal husbandry and life sciences. Under the circumstances, current rates of subsidy alone cannot be the guiding factor in assessing whether there is a level playing field. More equitable methods of calculating support from public funds to the farming sector, which also take into account investments to agricultural infrastructure, are called for.²

Pharmaceutical short cuts

In recent years, efforts have been made to provide pharmaceutical shortcuts, rather than food-based solutions, to problems of micronutrient deficiencies of populations in developing countries subsisting predominantly on cereal-based diets, even at the public health level. It is being suggested, for instance, that problems of maternal morbidity and low birth weight can be successfully combated by an arbitrarily chosen concoction of synthetic vitamins. This suggestion will, of course, be music to the ears of the vitamin cartels. This is an approach that needs to be resisted, not only on the grounds of unsustainability, but also on scientific grounds. We are now beginning to understand the intricate metabolic interrelationships between micronutrients; we are also becoming aware of the fact that foods (especially plant foods) contain, in addition to conventional nutrients, a wide range of health-promoting bioactive phytochemicals. Nutrient deficiencies that cannot be solved by foods are extremely rare.

This is not to argue against selective fortification of foods with appropriate nutrients in order to meet special situations. However, the primary objective in the quest for nutrition security must be to ensure the availability, at the household level, of balanced diets that will meet not only energy needs, but also the requirements for micronutrients and macronutrients.

In order to achieve adequacy of food production, developing countries must adopt scientific, safe and ecologically

sound agricultural practices. The earlier mistakes, which led to the present green revolution 'fatigue', need first to be corrected and the resultant imbalances with respect to low production need to be reversed. Second, the emerging new technologies that offer promise need to be effectively harnessed and adapted with due considerations for safety and sustainability. These strategies are briefly considered below.

Strategies

Reversing green revolution 'fatigue'

The intensive agricultural technology adopted earlier as part of the green revolution was not always pursued with appropriate precautions. Intensive irrigation and heavy use of high-analysis chemical fertilisers should always have gone hand-in-hand with periodic soil testing and soil replenishment. Thus, loss of soil micronutrients and soil fertility could have been avoided. Irrigation without arrangement for drainage has often contributed to the increasing salinity of the soil. The indiscriminate use of pesticides, fungicides and insecticides upset the biological balance. Unscientific excessive tapping of underground water through thousands of tubewells has led to the rapid exhaustion of this important resource. Exploitative agriculture adopted during the green revolution should have been based on proper scientific evidence and training; unfortunately, this was not always the case.

The green revolution has also led to some unfortunate imbalances with respect to food production. Attention was solely directed to wheat and rice, to the relative neglect of pulses, millets and vegetables. The per capita availability of pulses, an important source of lysine, riboflavin and folic acid, has now diminished. Millets, which were the main staple of the rural poor, have now been practically displaced by wheat and rice. Pulses and millets are important food items that could have provided much-needed micronutrients. Horticulture has also failed to receive adequate attention, with the result that there have been no great gains with regard to the production of vegetables and nearly one-third of vegetables and fruits produced continue to perish. Agro-based industries and village-level technologies for the preservation and storage of fruits and vegetables were not adequately encouraged. As a result, while developing countries managed to avoid hunger and famine and achieved adequacy with respect to energy requirements, the diets of the poor continued to be unbalanced and deficient in nutrients. Some degree of security against famines was achieved, but not nutrition security. The challenge now before agricultural scientists is to reverse these trends and ensure balanced, sustainable ecologically sound agricultural development.

Nutrition security cannot be achieved by reliance on just one staple. Diets exclusively based on rice or wheat will be deficient in a range of micronutrients, apart from being relatively poor in protein quality. Diversification of household diets is necessary and a national food production policy should aim at the achievement of balanced production and availability of a range of basic essential foods. The achievement of satisfactory levels of milk production in India is, for instance, highly conducive to nutrition security. 'Operation Flood', which has now made India the leading milk producer in the world, is a striking example of what a developing country can achieve through the efficient implementation of

a well thought-out programme. The production of pulses and vegetables and fruits must now, likewise, be augmented.

Harnessing emerging new technologies

Even if we succeed in imparting a 'second wind' to the green revolution of earlier years, it is unlikely that the expanding food needs of the next century will be met. Therefore, we must opt for the judicious use of new technological breakthroughs that offer promise. The phenomenal population growth in developing countries has led to shrinking land resources and food needs can be met only if we are able to produce substantially more food per unit land in ways that do not involve ecological and social harm.

Genetic engineering

New genetic technologies offer the promise of breeding food crop varieties for resistance, namely tolerance to biotic and abiotic stresses, drought and salinity resistance, and even better nutrient quality. Rice, for example, could be genetically engineered to contain vitamin A. Genetic technology applied to horticulture could result in the production of vegetables and fruits with improved micronutrient content and better acceptability. Large private corporations in the US and Europe are currently making major investments in using these technologies to produce new plant varieties for large-scale commercial agriculture. Much of this action is now occurring in industrial countries under the purview of proprietary science. The free flow of knowledge and information, possible in the earlier days of the green revolution, could now prove difficult to maintain, to the detriment of developing countries, which most need to benefit from these new technologies.

There is currently widespread concern regarding the safety of some genetically modified foods (see Table 2) and some of these fears may prove to be justified. There seems to be a polarization of views regarding the safety of these foods; the go-ahead optimism of the US is apparently not being shared by Europe. The present concerns relate to the possible direct effects of the transferred genes on the recipient organisms, the possibility of unfavourable recombinations, the behaviour of these foods under actual field conditions, allergenicity and toxicity, environment and biodiversity, and nutritional quality. A recent statement⁴ issued by the Royal Society on genetically modified plants for food use and recent papers on this subject by Swaminathan² and

Table 2. Genetic modification of plants for food use

Merits
Productivity enhancement
Abiotic and biotic stress tolerance
Reducing post-harvest losses
Development of value-added food products
Improving protein quantity and quality
Increasing the starch content of crop plants
Increasing the vitamin content in plants
Producing edible vaccines (e.g. hepatitis B surface antigen in tobacco)
Disadvantages/current concerns
Lack of information on the behaviour of a gene transferred into an alien atmosphere
Adverse impacts on human health and the environment

Paroda⁵ present a balanced and not too euphoric picture. Recent data provided by the US Department of Agriculture (USDA) would suggest that euphoria with respect to genetically modified foods may, as yet, be premature. The USDA has just released figures for 1997 and 1998 on the performance of genetically modified cotton, maize and soyabeans. Some of the genetically modified crops produce the insecticide Bt. Others are modified to tolerate high doses of the herbicide glyphosphate. According to this report, farmers who had shifted to genetically engineered crops were getting no better yields than farmers who continued to grow traditional varieties and a similar quantity of pesticides is still needed in the case of genetically engineered crops. However, in one region in the mid-west of America, farmers planting Bt maize had yields 30% higher than those growing ordinary crops. The USDA officials admit that, at face value, figures available so far do not provide much support for those who argue that genetic engineering will almost bring about a revolution in agriculture.

There is clearly a need to collect convincing evidence of the efficacy and safety of genetically modified foods before they can gain general public acceptance. A precautionary package for the safe and beneficial use of genetically modified foods needs to be developed. Ethical codes for experimentation and field testing need to be in place as national and international protocols in order to ensure biosafety.

In a remarkable recent address to a leading private investor,⁶ Gordon Conway, the President of the Rockefeller Foundation, advised a powerful private investor to 'disavow terminator technologies' that prevent reseeding. This technology has generated widespread suspicion that the effort to develop genetically modified foods is entirely motivated by commercial consideration of perpetual royalties. Conway also pleaded that '... the biotechnology company should donate technology to developing countries and train local scientists in biosafety'. Conway concluded his address with the following comment:

'We need a new way of talking and reaching decisions. You will not overcome public concern in Africa, Asia and Latin America simply by issuing statements reassuring poor people that you are committed to feeding them and caring for their environments. It would be better to treat them as equal partners in a dialogue.'⁶

It is to be hoped that genetic engineering efforts will be informed and guided by such humane and enlightened considerations.

Meanwhile, developing countries should have their biosafety protocols in place, thereby ensuring a critical evaluation of transgenic plants for possible harmful effects. Prescribed parameters for testing these foods for possible allergenicity and toxicity should be used by laboratories staffed by scientists especially trained for this purpose. The necessary scientific infrastructure needed for the evaluation of the safety of genetically modified foods must be present within the country using these foods.

Information technology

The world is now in the midst of an information revolution and, as a result, the societies of tomorrow will be 'knowledge

societies'. Poor communities around the world, among whom there is considerable illiteracy, could be further marginalized. It will not be enough for them to overcome current illiteracy; they will have to acquire and make use of the emerging knowledge skills. Access to the internet will soon be universal and will facilitate interactive distance learning. Computing will make it possible to construct simulation models with possible applications in the preparation of plans for food production under different weather conditions and market variations. If developing countries do not adequately avail themselves of these technologies, this could lead to further polarization of the world into the connected and the isolated.

The challenge is to use the evolving tool of the internet in various ways to adapt it to local needs. The Village Information Project of the Swaminathan Research Foundation in India provides an example of this.⁷ Even in villages without telephones, the project brings people the knowledge they need:

'Free-standing solar-powered computers are updated daily with information relayed through radio handsets and cell-phones from a regional centre with direct internet access. The village computer acts as a bulletin board for providing warning of pests, weather and water risks to farmers besides providing information on health centres and education material for school children.'⁷

Information technology will play an important role in future programmes of food production and developing countries must strive to achieve access to this technology.

Ecobiotechnology

Apart from genetic engineering, modern biotechnology also offers other promising ways of augmenting food production that are less likely to cause concerns and that are more in consonance with ecological safety. For example, the Tata Energy Research Institute (TERI) in India has recently developed biofertilizers, known as mycorrhizae, that help various kinds of vegetables and fodder crops to increase their yield by an impressive 30–50%. Mycorrhizae are a mixture of fungi that attach to plant roots and develop a symbiotic relationship with them. They are able to fix nitrogen from the air, absorb phosphorous and other nutrients present in the soil in low concentrations and transfer them to the plants. The advantages of this technology are its low input of chemical fertilizers and improvement in soil health and prevention of plant diseases. Each plant species seems to benefit only from specific strains of fungi. The same technology has also been shown to be able to grow tracts of fly ash ponds and waste lands, something that would have seemed impossible a few years ago. Relatively inexpensive and ecologically safe technologies of this kind could be developed for widespread use in developing countries.

There are similar, as yet untapped, opportunities for developing techniques that can lead to high food productivity without adverse impact on the natural resource base. Blending traditional and frontier technologies could lead to the birth of useful ecotechnologies. An example of traditional technology in the area of water harvesting comes from the deserts of Rajasthan in India, where traditionally women continue to harvest water in simple structures called *Kund*, as a result of which drinking water is available even in an area with less than 100 mm annual rainfall.²

The concept of intellectual property rights needs to be widened to include the rights and expectations of holders of such traditional knowledge. The challenge is to be able to achieve a judicious blending of traditional and frontier technologies in a manner that will, on the one hand, increase efficiencies, production and income generation and, on the other, will cause no adverse impact on national resources or on prevailing cultural practices.

Food processing and preservation

There is considerable scope and need for the expansion of agro-based industries in villages and townships. This could create considerable job opportunities. It could also lead to better production and more effective utilization of local food resources by the community, as well as reducing the present considerable loss of perishable food items. Local organizations could be entrusted with the responsibility of organizing village-level feeding programmes in schools and welfare programmes, instead of depending on foods donated by foreign organizations and alien to the local dietary culture. Nutrition and welfare programmes could then become programmes of the people, by the people, for the people.

For developing countries still struggling to find their feet in the present transitional phase of development, it is important to ensure that decentralized small-scale food systems that today provide great employment opportunities for people in the countryside are not replaced overnight by global agro-business corporations attempting to control the entire food chain. Wheat and wheat flour, for instance, provide livelihood and nutrition to millions in India. In the current decentralized small-scale economy, based on millions of producers, processors and traders, people are the substitutes for capital and infrastructure. Developing countries should be careful not to allow this traditional approach to be hijacked by global agro-business in the name of modernization.

Ensuring equitable distribution at the household level

Food adequacy at the national level is a necessary, but not sufficient, condition to ensure household nutrition security. For example, although India has today built up fairly adequate buffer stocks of food grains, nearly one-third of households in the country do not enjoy full nutrition security. Buffer stocks can help combat transient food scarcity associated with natural disasters, such as floods and droughts. These acute disasters are, no doubt, now being handled more expeditiously and efficiently than in the past and lives are being saved by timely action. Early warning systems are in place and food can be rushed into areas of threatened distress fairly rapidly. What is proving more difficult, however, is the task of combating chronic mild/moderate under-nutrition in a large number of poor households under normal circumstances.

Eradication of poverty

Lack of nutrition security, in the ultimate analysis, is but a manifestation of the poverty syndrome, the mutually reinforcing attributes of which are illiteracy, poor vocational skills and consequent poor family income, poor access to food, poor housing and environmental sanitation, poor access to basic health services and a lack of self-esteem and consequent poor motivation for individual or collective action

for socioeconomic advancement. Considerable proportions of populations of developing countries are now caught in the poverty trap; nutrition security will become possible only if these communities are enabled to liberate themselves from this syndrome. Durable, sustainable nutrition security cannot be achieved unless these mutually synergic factors of the poverty syndrome are dealt with collectively and unless there is a convergence of programmes designed to address each of its components. Narrow vertical programmes, which mainly focus on individual symptoms of the poverty syndrome, can only help mitigate undernutrition temporarily.

The governments of some developing countries have undertaken large-scale supplementary feeding programmes that target children of poor communities. These are expensive programmes, in which generally less than 40% of the expenses incurred actually benefit the children; often the programmes are not effectively targeted (e.g. children younger than 3 years of age, who may be considered more vulnerable, are not reached). It is true that the children actually reached at least get almost one-third of their daily nutrition requirements; for population groups in dire poverty, this could be an important contribution. However, unless the programme is used wisely, along with other efforts, as an entry point to facilitate an ascending spiral of development in the community, no lasting benefit will be achieved. Free give-away programmes are the least cost-effective way of achieving nutrition security. They can only be justified as temporary relief operations in regions and seasons of dire poverty and food scarcity.

The supplementary feeding programme undertaken as part of the Tamil Nadu Integrated Nutrition Project of the World Bank in South India was a well-targeted programme focusing on children of poor communities and was associated with programmes educating mothers in appropriate child-rearing practices. Despite its limited success and its usefulness as a demonstration, a programme of this nature is not to be looked upon as a lasting solution. In the Integrated Child Development Service (ICDS) in India, supplementary feeding programmes are poorly targeted and succeed only in reaching children over 3 years of age. While ICDS has apparently succeeded in improving immunization coverage, it has failed to make a dent in the persisting problem of low birth weight, largely because pregnant women and adolescent girls were not effectively covered. By and large, strategies that help the community to help itself are those that are likely to succeed eventually and to contribute to promoting self-reliance and lasting nutritional improvement.

Experience of the past 50 years has shown that severe forms of malnutrition, once rampant, have now largely been eliminated from most Asian countries, not because of narrow vertical nutrition intervention programmes, but because of all-round socioeconomic development, however slow. While well-targeted supplementary feeding programmes may be necessary as a relief operation in special situations, they cannot be the durable strategy for nutrition security. There may be a temptation to use large-scale supplementary feeding give-away programmes as soft populist options for narrow political gains. Investments in essential infrastructure, roads, improved communications, basic health services and facilities for schooling and vocational training for the poor may yield long-term benefits. Where supplementary feeding programmes are resorted to in special situations, they must be

part of an integrated effort aimed at all round improvement of the community.

The public distribution system

The public distribution system (PDS) has been looked upon as a major instrument for ensuring equity in the matter of food distribution (see Table 3) because it provides access to food at reasonable prices.

While the system is important, it would be wrong to expect that, by itself, it would lead to the achievement of nutrition security in poor households. First, the system has to be specially targeted to populations identified to be poor. The criteria for poverty that will entitle people to the PDS service need to be defined and strictly applied. This has not always been done. Second, in rural areas, agricultural labourers and small landholders eat off the land and their food consumption figures are not reflected in market transactions. It is for these reasons that, in India, the take-up of food grains from the country-wide PDS system represents only a small fraction of the total food grains calculated to be actually consumed by the poor.⁸ In contrast, PDS may be of more direct benefit to the urban poor. Despite its limitations, PDS well-targeted to the poor is an important facility that can contribute to nutrition security.

Urbanization

Ongoing rapid urbanization is adding an important new dimension to the problem of ensuring household nutrition security. In India, for example, compared with the 15% of the population that was urban 50 years ago, it is estimated that within the first decade of the next century this figure could reach 40%; nearly one-third of this urban population will be made up of the poor inhabiting the slums. Unlike the rural poor, who are largely agricultural labourers, the urban poor generally belong to the unorganized urban labour sector, with entirely different occupation patterns. Therefore, steps for the achievement of nutrition security in urban poor households could differ from those that may be appropriate for the rural poor.

Because it is often young adults from rural areas who migrate to towns, leaving behind their old parents and grandparents, the health and nutrition problems of the aged and destitute in rural areas could increase in importance. Because the longevity of women exceeds that of men, many rural households in rural areas are already being headed by single old women and, thus, women could be the major sufferers of rural poverty. Indeed, nutrition security for the aged will become an increasingly important problem in developing countries in the next century.

Despite these deleterious repercussions, urbanization is a catalyst for change. It brings the poor and rich into close geographical juxtaposition; this, together with the proliferation of television, is already leading to increasing awareness on

the part of the poor of the enormity of their deprivation. Because the urban poor often commute periodically to their erstwhile rural homes, this awareness is not confined to the urban poor. It is also the case that a considerable proportion of the erstwhile urban poor who had migrated from their rural homes have now managed to ascend the socio-economic scale and become part of an expanding (neorich, first-generation) affluent middle class. It is estimated that, in India, the population belonging to this urban middle class may now exceed 200 million (more than 12-fold the population of Australia). While this situation may seem explosive, it also provides a climate for change. It would be wise to use this favourable climate in order to bring about peaceful change for the better and to avoid social unrest.

As was pointed out earlier, the problems of the urban poor are somewhat different to those of their rural counterparts. The urban poor usually belong to the unorganized labour sector. In many poor urban households, not only men, but also women, go out to work; exclusive breast-feeding for approximately 4 months of infancy, which is the common practice in rural areas, is not possible under these urban conditions. Women belonging to the unorganized labour sector do not enjoy maternal benefits. Thus, urbanization poses a serious threat to breast-feeding and infant nutrition. Day care centres where infants and young children can be looked after are generally not available. This situation needs to be corrected.

Ready-to-eat foods and street foods are coming into increasing use in urban areas. The study on street foods carried out in Calcutta by Chakravarty⁹ provides useful information. Street foods are relatively inexpensive and are generally in conformity with the local cultural dietary practices and, if hot and fresh, the possibilities of microbial contamination are reduced. In countries such as Bangladesh, India, Myanmar and Thailand, street foods based on traditional diets are currently in wide use. Through training of the vendors in the observance of strict personal hygiene and care in food handling, street foods could be made safer and these could continue to make some useful, relatively inexpensive, contributions to nutrition security in big urban slums. In contrast, fashionable fast-food units now springing up in big cities, largely modelled on western lines, are unlikely to make significant contributions towards nutrition security of the poor.

Intrafamilial food distribution

The availability of adequate food at the household level does not necessarily imply that the food is distributed to household members according to their physiological needs. The worst sufferers in this regard, particularly in households with marginally adequate food supply, are women (especially pregnant women) and children or infants; the male wage-earner gets the lion's share. The extra food needed to meet the food and nutritional requirements of women and, especially, children, generally constitutes a small fraction of the total food already available for the household. Faulty intra-familial distribution of food and a faulty choice of foods contribute to a considerable part of undernutrition in children and women in poor households. Much of the mild or moderate malnutrition in children of poor communities is directly attributable to poor infant and child feeding practices, due

Table 3. Anti-poverty strategy

Need for effective convergence of programmes addressing all components of the poverty syndrome
Limitations of bureaucratic welfare give-away programmes
Inefficiency of large-scale supplementary feeding programmes
Public distribution system

not so much to a lack of food in the household but to faulty child-rearing trends. Significantly, a good part of the high incidence of low birth weight deliveries in poor communities is also attributable to lack of awareness of the special nutrient needs of women during pregnancy. This is an area in which nutrition education could make a significant contribution, even in the context of poverty.

Basic health services, safe water supply and personal hygiene

Much of the undernutrition currently prevalent in children of developing countries is attributable to conditioned malnutrition, arising from infections. Diarrhoea and respiratory diseases, largely attributable to a poor environment and lack of personal hygiene, are now contributing heavily to child morbidity and undernutrition in millions of poor households in developing countries. Improvement of environmental sanitation, the provision of safe drinking water and the observance of personal hygiene will make important contributions to nutrition security in poor communities. Prompt and appropriate treatment can help considerably to reduce morbidity; in the absence of adequate access to appropriate health facilities, this becomes impossible. Safe water supply, good environment, good personal hygiene and good basic health care may make as much, if not greater, contribution to nutrition security in poor communities than supplementary feeding programmes pursued in the context of continuing poor sanitation, poor health care and poor personal hygiene. Improvement in basic health services has to be accorded high priority in any development programme addressed towards poor communities.

Adolescent girls

For over 15 years, I have been earnestly pleading for a special focus on adolescent girls of poor communities in our health/nutrition/development programmes.¹⁰⁻¹² Most of these girls drop out of school after the first few years of schooling and are engaged in minor chores in their homes, helping their parents and waiting, as it were, for menarche to arrive. Invariably thereafter, they are 'trapped' into marriage and start their reproductive lives. These are the mothers-to-be, a crucial part of the population, who will not only usher in the next generation, but will also shape it. Today, most adolescent girls of poor communities enter marriage totally unprepared for the task of motherhood and child rearing. Adolescent girls are not reached by the health and welfare services, being neither children nor pregnant nor old. The precious years of adolescence, which could appropriately be used for preparing and equipping these mothers-to-be, are today being wasted. Adolescent girls, more than any other sector of our population, hold the key to the future. Any programme for social development and nutrition security must give proper attention to this group.

Because a considerable proportion of adolescent girls of poor communities in rural areas are not in school, programmes of non-formal education for adolescent girls, with an emphasis on health, nutrition and child rearing, would be a practical way of preparing them for motherhood and citizenship. The Nutrition Foundation of India has organized programmes along these lines and has implemented them among some rural communities in North India, showing that

such programmes are, indeed, feasible.¹³ Rural girls can be organized to become part of a health scout movement in villages, to act as facilitators and agents of change in the interface between the provider and the consumer. Indeed, child welfare programmes, like the ICDS in India, instead of being conducted, as at present, as a bureaucratic operation, could be largely run by well-trained and dedicated local youth. It is through such imaginative steps that attitudinal changes in poor village communities can be brought about, generating self-reliance and self-esteem.

In some developing countries, there have been major attempts at decentralization of administration, especially with respect to rural development and welfare programmes. In India, for example, village panchayats, comprising elected representatives of the people, are being organized and vested with some administrative powers. There is also the welcome stipulation that at least one-third of the members of these panchayats must be women. Adolescent girls, trained as suggested above, could well qualify to eventually become elected members of their village panchayats. Thus, an informed and self-reliant community, largely comprising of local youths, could be empowered to play a major role in the implementation of welfare or nutrition programmes. Adolescent girls, thus motivated and equipped, could become part of a national youth movement (health scouts), participating in and contributing to national development. The growing populations of developing countries, instead of being seen as a major problem as they are at present, may then well become a major asset. Family planning programmes would make greater headway and family size would be reduced. Through imaginative action of this kind, community leadership and self-esteem can be generated. Nutrition security will follow, as the inevitable result of such all-round development.

A recent report of the National Family Health Survey¹⁴ in India has concluded that the prevalence of malnutrition can be reduced by improving the educational level of mothers and that such efforts should be combined with programmes that raise women's awareness of the nutritional requirements of children. An earlier study by the Nutrition Foundation of India¹⁵ had also recognized that nutrition intervention would be effective when the education of both parents, especially the mothers, was ensured up to middle or high school. In other words, formal education of adolescent girls and boys must be strengthened so that parents-to-be are aware of healthy dietary practices and can provide a stimulating environment for their children's psychological and cognitive development.

The recent decision by the Government of India to award attractive stipends for schooling to the female children of poor communities is an imaginative step in the right direction. What is particularly attractive about this programme is that the level of stipends is to be progressively increased with stages of schooling, with the aim of discouraging school dropouts. However, this step alone will not have a significant impact on female literacy unless parallel efforts are made to improve school education at the secondary and high school levels. Even rural schools should impart computer and internet education at the secondary and high school levels. This may seem a tall order at present, but unless adequate investments are made in this direction in the upgrading and

modernization of school education, developing countries will not be able to make rapid progress in the next two decades.

Improving income-generating vocational skills

In the next century, brain rather than brawn will play the determining role in ensuring the quality of human resources of a country. Tomorrow's societies will be knowledge societies and only those with appropriate skills will be able to effectively participate and benefit from development; others will be left behind. New communication and computing techniques will exert a profound impact, not just on research, but also on daily activities and seemingly routine occupations. What is needed in this emerging situation is not just literacy, but the acquisition of vocational skills on the part of women as well as men. By imparting vocational skills, the income-generating capacity of the poor can be raised, thus ensuring their nutrition security as part of an improved quality of life. Indeed, female education and the empowerment of youth with knowledge and skills could be the best means to bring about desirable nutrition security. The task before developing countries where the level of literacy is still low is formidable; however, this major challenge must be squarely met.

Mobilizing and empowering the community

The experience of the past few decades clearly shows that the main focus in programmes designed to bring about nutritional improvement must shift from the provider (the government) to the consumer (people). For too long, community development/nutrition programmes have been conducted as bureaucratic operations with the community being treated as a passive (and hopefully grateful) receiver of goods and services being provided by the government. This has led to a lack of accountability and achievement audit and has damaged self-reliance and self-esteem. The psychological distance between the provider and consumer has widened; a passive community often blames the government for not doing enough for it and an arrogant bureaucracy often blames the community for its ignorance and non-cooperation. The time for change has now arrived. The confusion as to what constitutes the 'centre' and what constitutes the 'periphery' must now change. The centre is not the government in the geographically and psychologically distant capital cities, but is very much in the villages where the real action lies. The bureaucrats are the support group and it is the community that must now take the lead. Once this attitudinal change is accepted, the community can be encouraged and equipped to assume its leadership role. The government's role should be limited to providing such resources as will be needed to facilitate community action.

Programmes designed to bring about nutritional improvement, involving such community based activities as home gardening and nutrition education, can be successfully organized and implemented by village level community organizations using trained local volunteers drawn entirely from the community, generating and using local food resources. Examples of three major projects recently undertaken in Asian countries will serve to highlight the importance and feasibility of this approach.

Productive VAC in Vietnam (VAC being an acronym for garden (V), pond (A) and cattle-shed (C))

In Vietnam, several integrated programmes of local food production, home gardening (vegetables, beans, roots and tubers and fruits), animal husbandry and fisheries (fish and shrimps) have been successfully organized. In these programmes, '... various health/nutrition programme activities were combined to create a harmonized integrated system wisely managed by the community itself.'¹⁶

Community based programme in Thailand

This programme helped to demonstrate that community leaders and volunteers could be used and actively engaged in the implementation of programmes that included growth monitoring of children, antenatal services and household/community food production. Government officials were the facilitators who provided technical support where needed. The programme helped strengthen the ability of the community to conduct self-help activities.¹⁷

The Purulia Project in West Bengal, India

In this project, through the active participation of local volunteers, women and youth working under the village panchayats, local production and consumption of carotene-rich foods, vegetables and fruits was increased. Furthermore, increased nutrition knowledge and awareness were generated on the part of the consumer. The prevalence of vitamin A deficiency in the community was substantially reduced, demonstrating that the problem could be combated through local efforts and using local natural food resources.¹⁸

The above examples convey a common message. Such examples can be multiplied several-fold, Poysandu experience in Indonesia being an outstanding example. By using, training and effectively channelling the immense potential of local communities and by wise utilization of local food resources, considerable success can be achieved in ensuring household nutrition security. The active participation of the community will enhance its self-reliance and self-esteem and will be conducive to its all-round development.

During the 20th century, nearly half the population of the Third World was engaged in a struggle for survival where 'success' was measured in terms of avoiding famines, freedom from hunger, child survival and safe motherhood. In the 21st century, policy makers of developing countries should set more ambitious targets. Household nutrition security must come to mean a lot more than avoidance of chronic starvation. Foods for families must be adequate, not just meeting the bare energy needs for survival, but providing all the nutrients essential for normal development to enable populations to find full expression of their innate genetic potential. When vast sections of people currently imprisoned in the poverty trap are thus liberated and achieve nutrition security, the present polarization of the world into the haves and have-nots will diminish. The poor of today will become active participants in, and beneficiaries of, the development process instead of being the sullen, passive bystanders that they are at present. Development will then acquire a truly human and humane face.¹

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