



RAP Working Paper Series 1/1

Nutritional Security:
Asian Perspective Beyond 2000

prepared by

Biplab K. Nandi

Food and Agriculture Organization of the United Nations
Regional Office for Asia and the Pacific
Bangkok
July 1999

Nutritional Security: Asian Perspective Beyond 2000

RAP Working Paper Series 1/1

**Prepared by
Biplab K. Nandi**

The designations employed in the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory or any area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Opinions expressed in this paper are those of the author alone and do not imply any opinion whatsoever on part of the FAO.

The author, Dr. Biplab K. Nandi, is the Senior Food and Nutrition Officer, FAO RAP, Bangkok. The current publication is a part of a Working Paper Series produced by the FAO Regional Office. Also in this Working Papers Series on Food and Agriculture -- Asian Perspective Beyond 2000:

- Asian Livestock : Year 2000 and beyond
- Women in Development of Agriculture and Rural Economies: Asian Scenario beyond 2000
- Fishery Perspective into the Next Millennium

This is an unedited version. Your comments and suggestions are welcome.

For copies, contact:

Meetings and Publications Officer
FAO Regional Office for Asia and the Pacific
Maliwan Mansion, 39 Phra Atit Road
Bangkok 10200, THAILAND
Telephone: (662) 281 7844
Facsimile: (662) 280 0445

Foreword

As we all know, one of the most dramatic achievements in the region has been the remarkable progress in reducing the extent of famine, hunger and starvation. Progress in averting famine was achieved by undertaking a wide range of concerted actions to enhance the development of agriculture leading to the production of greater quantities of safe and nutritious food.

The recent Asian financial crisis has further emphasized the critical role of agriculture on the road to economic recovery. There is an increased pressure on domestic food production and supply to meet the needs of a growing population. Our current and achievable challenge, therefore, is to build upon and accelerate the progress registered in the region to ensure safe, secure and nutritious food for the future.

This publication was prepared to enhance Asian prospects for achieving nutritional security towards 2025 by serving as a catalyst for further and sustained actions. It is part of a series of publications being prepared by FAO Regional Office staff for dissemination to planners, policy makers, concerned professionals and concerned citizens with a view to enhance the focus and effectiveness of information and communication related to the overall mandate and programme priorities of FAO in the Asia-Pacific region.

It reminds us that the bottom line indicator for success in agricultural and rural development should, therefore, not merely be increased food production and income, but the quality and diversity of food and its contribution to achieving nutritional security in nations, communities as well as for each person in every household. It introduces the strong need for examining the nutritional aspects of diets of populations both in macro and micro level perspectives. Addressing food diversity issues necessitates the use of food based strategies integrated closely with community based approaches that play a crucial role in achieving nutritional security, especially at micro level situations. Adoption of such an approach would facilitate the possibility of universal access to safe and nutritious food as a basic right to households and populations at large.

It is in this spirit that this Working Paper on 'Nutritional Security: Asian Perspective beyond 2000' is being produced. We realize that this is not the last word on the subject, and invite your valuable comments and observations on the Working Paper. These will encourage and guide the author to finalize the publication in due course of time. I trust the publication will prove to be a useful guide towards nutritional security of the region in the future.



Dr. Prem Nath
Assistant Director General and
Regional Representative for Asia and the Pacific

Preface

Malnutrition exists as part of the complex, widespread problem of poverty and deprivation that affects millions of people in Asia. In spite of increase in food supplies the world over, the underlying situation of most nutrition problems has not changed very much over the past 5 decades. Poverty, ignorance and disease coupled with inadequate food supplies, unhealthy environments, social stress and discrimination persist and combine to cause malnutrition. FAO initiatives such as the *International Conference on Nutrition (ICN)* and the *World Food Summit (WFS)*, have not only propelled national efforts towards ensuring the most basic human rights, that is the right to enough food to support a healthy life, but they have accelerated efforts to reduce malnutrition and micronutrient deficiencies.

Indeed food and the security of food supplies, and the ultimate impact of food on nutritional well-being are imperative for nutrition improvement of households, communities and nations. Consequently, ensuring food security is a necessary condition for improving nutritional status and, in turn, for achieving nutritional security. In essence, *nutritional security* denotes the consumption and psychological use of adequate quantities of safe and nutritious food by every member and encompasses the process of equitable distribution among members of households and communities. However, merely achieving food access does not necessarily result in nutrition security. There is, instead, need to ensure a *varied food intake*, comprising *all the essential macro and micro nutrients (vitamins and minerals), through a diversified diet*.

This publication uses FAO data to show that *there is enough food available* in the world, if distributed according to individual requirements, to meet the energy needs for an active, healthy life. It views the nutritional scenario of Asian countries in global perspective while also highlighting the wide diversity within the region. It shows that *available food is not equitably distributed* to all within nations, communities or households. It documents that undernutrition still exists in countries with adequate food supplies, and it also shows that an inadequate food supply clearly indicates there will be an even higher prevalence of nutritional problems.

Nutrition insecurity needs to be addressed in the context of *monitoring and surveillance* of nutrition situations, which call for ensuring food security, improving dietary adequacy, and overcoming vulnerability through a whole range of factors that influence nutritional status. The *Asian nutritional scenario* features a wide range of available data that could furnish a basic framework at the country level to develop *information systems* with respect to food security problems. Taking account of research undertaken within each country and national data collection, it is possible to analyse some of the underlying causes of malnutrition, to develop *indicators* to help achieve undernutrition-reduction targets and to determine what indicators will be regularly monitored. Continuous monitoring and assessment of the nutritional scenario at various levels with development of *timely warning systems* would keep the country prepared to face any adverse developments or food insecurity situations. These nutrition indicators not only need to be periodically *updated*, but they need to be supplemented by sub-national data and micro-studies and programme assessment to facilitate regular monitoring of policy and program implementation and options.

The *Asian nutritional scenario* is viewed in *global perspective and in regional perspective* as a comparison among countries. The analysis draws on the most recent research available on the impacts of nutritional insecurity. It draws on FAO data to highlight *progress and constraints* along with *emerging trends*. An attempt has been made to compile available data on the recent food and nutrition indicators from some countries in the region. However, there still exists scope to update this information periodically. This process of compilation and analysis can serve as a

model for creation of national and sub-national perspectives, which, in turn, would enhance the scientific basis for identification of nutritional security needs along with intervention points for implementation of policies and programmes. As contribution to this process, the discussion of *strategies and mechanisms* furnishes an overview of the range of options being implemented within the region, and these are supplemented in the appendices.

As illustration of the process, the proportion of underweight children provides the most commonest indicator of malnutrition. FAO data for Asian countries highlights trends in *underweight prevalence* as particularly indicative of nutrition progress and more generally of human development. Underweight, even in mild form increases risk of death and inhibits cognitive development in children, leads to reduced fitness and productivity among adults. The research discussed in the analysis shows its *perpetuation from one generation* to the next, through malnourished women having low birth weight babies. From the point of view of enhancing Asian prospects, the analysis concludes that it is essential to *target actions, especially reductions in prevalence of LBW infants*. Therefore, limiting this intergenerational transfer requires preventive action at the community level with particular emphasis on improving nutrition for the girl child, young girls, adolescents and young women before they become pregnant, and before they give birth to LBW infants.

The analysis of emerging trends highlights the impact of *two major processes simultaneously underway in many Asian countries - urbanization and globalization*. Rapid urbanization is shown to profoundly affect dietary and food demand patterns, and the quality of food in Asian countries. Within countries, changes in diet and life style associated with urbanization, higher incomes and longevity are giving rise to the *emergence of diet related non-communicable diseases* as major problems. These include obesity, cardiovascular diseases, diabetes, certain types of cancer and dental caries. Associations between these diseases and certain dietary factors (notably excess intake of energy and fat, especially saturated fat and cholesterol) and lifestyle factors (mainly smoking, emotional stress and lack of physical exercise). As support for national action, there is a need to examine the potential for a similar evolution within each country, taking account of prevalence data for various socio-economic groups and of *population ageing*, especially as regards an *Asian perspective on osteoporosis*.

This publication seeks ways to ensure *safe food* that will not cause harm to the consumer. It draws on the experience of FAO with inter-governmental co-operation in setting international standards that evolve from the *Codex Alimentarius* Commission (CAC), established by FAO/WHO. Supplementing Codex standards, member states of the FAO have adopted a series of international instruments dealing directly or indirectly with *biosafety and biotechnology*. The growing significance and influence of CAC is discussed in response to the World Trade Organization (WTO) and its Application of Sanitary and Phytosanitary Measures, known as the SPS Agreement, and Technical Barriers to Trade, known as the TBT Agreement. The features of *risk analysis and assessment* discussed here are necessary responses to globalization and liberalization with national production and international trade of safe food.

This Asian perspective highlights nutritional security as essentially a poverty problem. *The priority beyond 2000 is, thus, to invest more in poor people* with the objective of enhancing their productivity, health and nutritional well being by increasing their access to remunerative employment and productive assets. The focus on *strategies and measures* introduces the various ways governments enhance access to safe and nutritious food by *targeting measures* ensuring that food reaches the poorest and most malnourished people. Disparities among refugee populations need to be addressed appropriately, with the continuance of short-term food assistance for those most adversely affected. FAO also identifies target countries, as *Low Income*

Food-Deficit Countries (LIFDCs) suffer not only from inadequate food supplies, but also from low income for imports to make up for this food deficit.

Integrated rural development strategies investing in human resource development contributing to food and nutrition security should be promoted. Intersectoral mechanisms can help to identify priority problems, review and prepare *nutrition security plans* and establish intersectoral mechanisms for action. Poverty reduction coupled with support for health and education and with extensive and sustained community based programs aimed at improving nutrition, are vital in bringing about rapid improvement. Adding *people's participation* to this approach yields a multi-disciplinary approach to rural development recording immense success in rural communities. As a result of this combination, there is a shift in policy orientation towards the involvement of all household members, especially of women. The *empowerment of women* must be given priority, and women must be integrated into all activities as decision makers, and as resources for sustainable development

Well designed community projects in consonance with agricultural development and nutritional improvement are needed. Dietary behaviour and subsequently nutritional status can be improved when people's participation and nutrition communication strategies are designed appropriately using an integrated approach. To support a *diversified and nutritious food base*, agricultural and food policies should be developed which give due weight to dietary quality, derivation of foods, and the overall trends in supply. Many countries would do well by increasing their fruit and vegetable production and processing as this has marked implications with respect to addressing micronutrient malnutrition. This Asian perspective on nutritional security, not only identifies the importance of variety and diversity in food both produced and consumed, it also reminds us that nutritional security can be achieved with *traditional foods and diets*, and even further enhanced by home gardens and traditional methods of food processing, preparation and preservation.

This publication has attempted to identify the vital inter-links implicated in nutritional security. The impinging role of agriculture on food and nutrition and its potential effects on nutritional security indeed need to be addressed from a broad perspective. *An integrated approach in the context of Asian communities, and multi-sectoral components is seen as enhancing Asian prospects towards nutritional security, as we enter the new century and beyond.*



Biplab K. Nandi
Senior Food and Nutrition Officer

I. FOOD SECURITY AND NUTRITIONAL SECURITY

A. *Sufficient Quantities of Safe and Nutritious Food*

Improving nutrition of many millions who suffer from hunger and malnutrition and to others who are at risk of malnutrition in future, is a matter of prime concern to *planners, policy makers and nutrition related professionals*. Many goals have been set to improve nutrition in the recent past with commitments made by government and international initiatives and efforts. The International Conference on Nutrition (ICN) and the World Food Summit (WFS), held respectively in 1992 and 1996, remind us that *the most basic of human rights is the right to enough food to support a healthy life*.

Realisation of this basic right to food security requires access by all people at all times to the food needed for a healthy life' (FAO/WHO 1992). Food is accessed by home production, the gathering of wild foods, purchase with cash or exchange in kind and as gifts of food and food aid. Realisation of this basic right to food flows from strategies and measures ensuring the availability of sufficient food and access to food by those who do not produce it.

Ensuring varied food intakes, containing all essential macro- and micro- nutrients (vitamins and minerals) in sufficient quantities, through a balanced and diversified diet is also essential to support an active, healthy life. If a person is ill, these food requirements will need to be modified. Food also needs to be safe, and free from dangerous contamination. It must not contain high levels of natural toxins, such as aflatoxins, or artificial toxins such as pesticides. Families need to obtain and prepare enough food without alteration of its nutritive value and without contamination from dangerous substances.

Nutritional security thus involves the consumption and physiological use of adequate quantities of safe and nutritious food by every member of the household to support an active, productive and healthy life. For this to be achieved, households need adequate access to enough food to satisfy the nutritional needs of every member. Food then needs to be equitably distributed within the household, and each member needs to be in a state of good health, without the presence of any illness. Nutritional security thus envisages nutritional well being for all people, whereby sufficient quantities of safe and nutritious food are equitably distributed within households and among all communities and nations.

There is need to explore the full meaning of these twin pillars of food security and nutrition security both together and as separate terms, as they are linked in an interactive way. Not only are these linkages important features of effective policies and plans, they are essential features for the design and implementation of effective interventions.

Achieving food security requires considering all the things households do to earn money and survive. It also entails effective responses to the constraints on these activities. For example, purchases often account for a significant portion of total food consumption by families, especially in poorer households and communities, and the sale of surplus production by farm households is often an important source of income. Thus, markets may be a constraint, and change in access to markets or in prices influence food security.

What happens to the food after it is acquired, in terms of storage, preparation and safety is also important. Food and nutritional insecurities result if there is not enough fuel to prepare the food, if there is the storage facilities are insufficient or unsafe, if sanitation hinders food hygiene during food processing, preparation and consumption.

Access by households to sufficient quantities of food does not mean that all members of the family are acquiring food in the necessary quantities and nutritional qualities to support an active, healthy life. This food thus needs to be distributed within families and households to meet all the nutritional needs of each of its members. Even this does not ensure that each member actually eats enough food or the nutritious food.

Undernourished people cannot be as productive as when they are well nourished, and their potential and capacities cannot be optimally tapped when people are in a state of poor nutrition. These significant consequences of nutritional insecurity merit attention in developing Asian countries along consideration of the following important consequences:

- In infants and young children, undernutrition and growth retardation are associated with impaired intellectual development, lowered resistance to infection and increased rates of illness and death.
- Vitamin A deficiency leads to lower immunity and increased death rates in children, night blindness, and it is also the most important cause of preventable childhood blindness.
- In women, poor nutritional status is associated with increased prevalence of anaemia and of giving birth to low birth weight babies with higher incidence of death, disease and illness.
- In adults in general, undernutrition, anaemia and iodine deficiency can lead to poor health, resulting in impaired physical and intellectual performance, and lower productivity.
- In the long term, lower productivity due to malnutrition constrains the potential of communities and countries to achieve sustainable development.

This publication explores Asia's potential for achieving *nutritional security* in the new century and beyond. This section proceeds to furnish a regional overview in global perspective of some major trends. While its focus is *undernutrition*, it also takes note of growing concerns about *overnutrition*. It introduces the *Dietary Energy Supply* as the measure of available food for direct human consumption followed by a look at population growth as influencing food availability and, in turn, the prospects for nutritional security. It highlights the commitments made by governments at world conferences, wherein they shared their reviews of the national situation and their evaluation of successful interventions to furnish a reliable basis for their consensus identification of a set of recommendations. The discussion then follows the evolution of international standards adopted by governments to enhance their efforts in effective design and implementation of plans, policies and programmes to meet these commitments.

B. Regional Overview in Global Perspective

The *Dietary Energy Supply* (DES) is a widely used indicator of aggregate food and nutrition situations and it is expressed as an estimate of the average daily available for human consumption in the total food supply during a given period. The average per person food supplies available for direct human consumption in developing countries increased in the 1980s, although at a slower rate than in the 1970s, as shown in Table 1 below. Even though these supplies decreased in several countries during the 1980s, by the end of the decade about 60 percent of the world's population were living in countries with an excess availability of 2 600 kcal per person per day. Low Income Food Deficit countries (LIFDCs) experienced small but steady increases, but the food supply in Least Developed countries (LDCs) remains unchanged, at 2040 kcal.

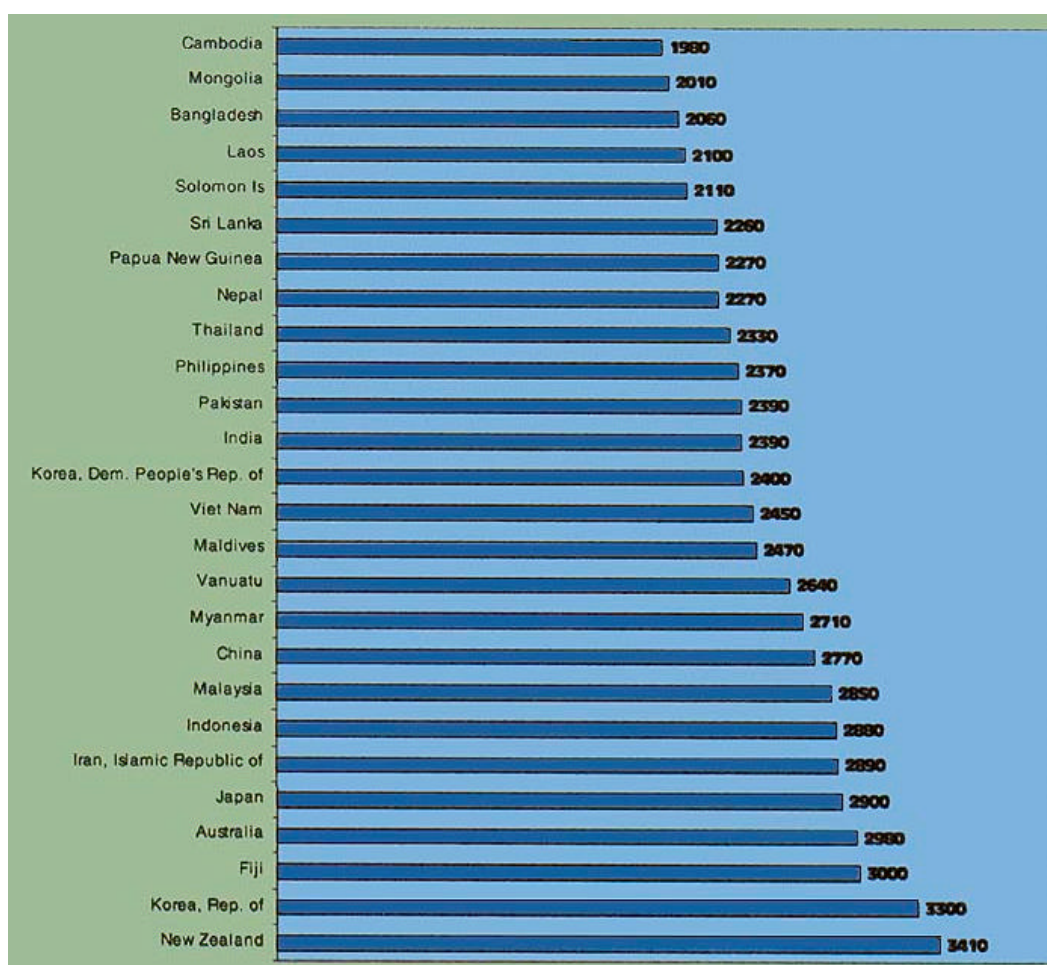
Table 1. DES (*Calories per Day per Person*) by Region and Economic Group

Region and economic group	1969–1971	1979–1981	1990–1992
World	2 440	2 580	2 720
Developed countries	3 190	3 280	3 350
Developing countries	2 140	2 330	2 520
East and South East Asia	2 060	2 370	2 680
South Asia	2 060	2 070	2 290
Least developed countries (LDCs)	2 060	2 040	2 040
Low income food deficit countries (LIFDCs)	2060	2230	2450

Source: The Sixth World Food Survey (FAO 1996a)

Grouping countries above and below a daily supply of 2 600 kcal/person further highlights disparities; whereby, in 1989–1990, 41 developing countries (with populations over 1 million) had food supplies above 2 600 kcal/person, and 15 countries had supplies above 3000 Calories. In contrast, only three developed countries had less than 3 000 kcal available (FAO/WHO 1992). The most recent data for 1994–1996 shown in Figure 1 below, highlights disparities within Asia and the Pacific region, whereby a majority of 15 countries had an available food supply of below 2600 kcal/day/person, and only three countries had supplies of 3 000 kcal or above.

Figure 1. Dietary Energy Supply (DES) in Asia and Pacific Countries, 1994–1996
(*Calories/day/person*)

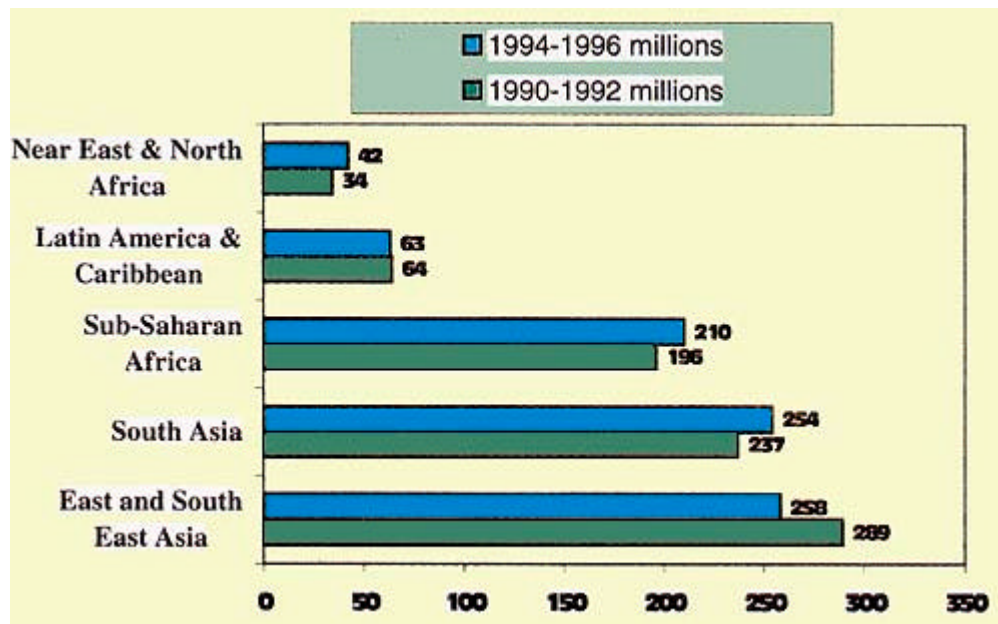


Source: FAOSTAT, Rome, 1999.

Chronic Energy Deficiency (CED) furnishes an important measure of basic energy requirements of an active and healthy life for which sufficient food must be available. FAO data highlights the availability of enough food in the world, if distributed according to individual requirements, to provide well over what would have been needed to meet these energy needs. The dietary energy supplied by the available food supplies increased in developing countries during the two decades spanning the period between 1969–1971 and 1990–1992 (FAO 1996a). As a result, the prevalence of food inadequacy fell from 35 per cent to 20 per cent, representing a decline from one in three persons to one in five.

Despite these improvements, in 1994–1996 an estimated 828 million people in developing countries regularly failed to have access to enough food to meet their dietary energy needs for an active, healthy life (SWFS 1998, FAO Home Page). This represents an increase from 822 million people in 1990–1992. Declines took place in East and South East Asia, but an additional 17 million South Asians became undernourished during this period, as shown in Figure 2 below. Not only is the number of chronically undernourished people rising in the world, but nearly two-thirds of these energy deficient people lived in Asia — 512 million - in 1994–1996.

Figure 2. Number of Undernourished People

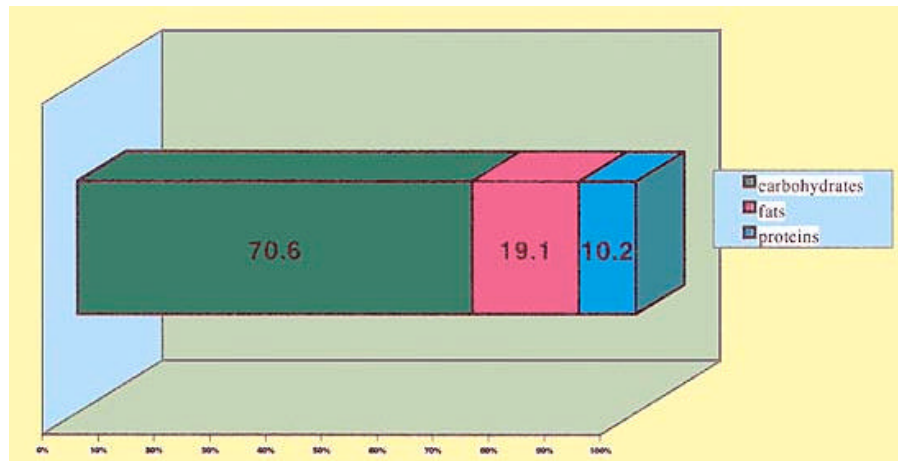


The Asian and Pacific region experienced continued improvement in alleviating chronic energy deficiency during the last 20 years, with the proportion of the population affected falling from 41 to 16 per cent in East and South East Asia and from 33 to 22 per cent in South Asia (FAO 1996a). Total numbers declined in East and South East Asia from 289 million to 258 million people, but South Asia experienced an increase from 237 million to 254 million. Children form the largest vulnerable group experiencing energy deficiency, and most of these undernourished children live in Asian countries.

To support an active and healthy life, dietary energy must come from diverse food sources. Protein supplies in South Asia remained constant during the 1980s, but increased in the 1990s. In East and South East Asia increases characterize the last two decades. Data for 1994–1996 in Figure 3 illustrate that the available food supply in Asia and the Pacific remains deficient in sources of protein and fat relative to carbohydrate. The average fat and protein intakes need to be increased, which presently amount to about 19 percent and 10 percent, respectively. This lack of

food diversification gives rise to *protein energy malnutrition* (PEM), which is widespread throughout the world. Children are the major victims of PEM, an estimated 192 million children under age 5 years suffer from acute or chronic symptoms.

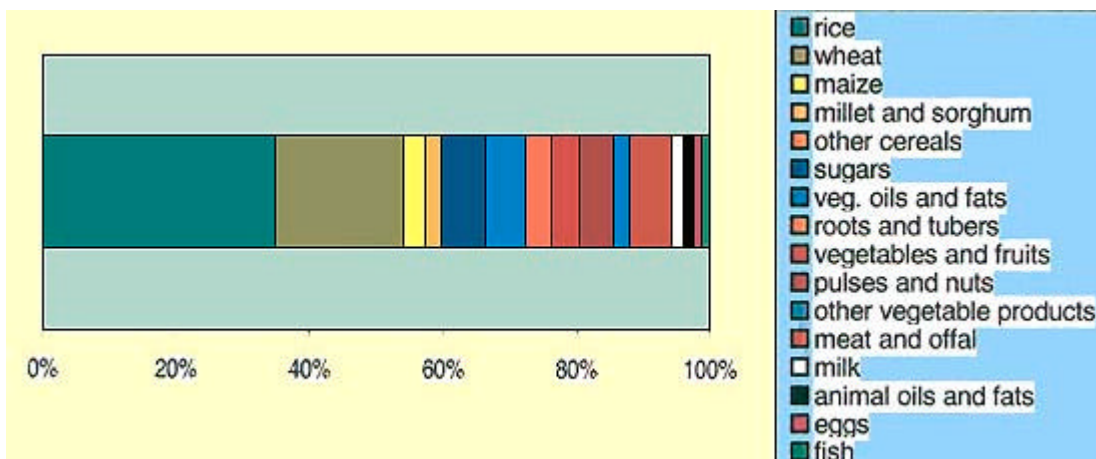
Figure 3. Carbohydrates, Fats and Proteins as Share of Dietary Energy Supply (DES) for Asia and Pacific Region, 1994–1996



Source: FAOSTAT, Rome, 1999

Worldwide, the most prevalent *micronutrient deficiencies* are lack of *iron, iodine and vitamin A* (FAO 1996a). More than 2000 million people in the world experience the consequences of iron deficiencies, 1 000 million are at risk to iodine deficiency, and 40 million consume insufficient *vitamin A*. Over 50 per cent of the population in developing countries, and in Asia in particular, are affected by these deficiencies. Large numbers also suffer the consequences of other micronutrient deficiencies, such as those caused by a lack of B-complex vitamins, zinc, selenium and other trace elements. Availability and accessibility to food diversification and variety is essential for overcoming micronutrient deficiencies. However, as the data in Figure 4 below illustrates, the major component of the regional food supply is cereals, with inadequate food diversity in essential sources of micronutrients, such as vegetables and fruits, roots and tubers, and pulses and nuts.

Figure 4. Major Food Groups as Share of Dietary Energy Supply (DES) for Asia and Pacific Region, 1994–1996.



Source: FAOSTAT, Rome, 1999

Simultaneously throughout Asia, diet-related *non-communicable diseases*, such as *obesity*, cardiovascular diseases, diabetes and some forms of cancer, are emerging as public health problems. Available data in South East Asia indicate that many Asian countries are undergoing a “nutrition transition” that is associated with major increases in obesity prevalence arising from a combination of shifts in diet structure, overconsumption and reduced physical activity (Popkin 1994). This transition coincides with the rapid process of urbanisation and rising incomes in urban centres in many Asian countries.

C. National Commitments to the Twin Pillars

Considering the multifaceted character of food and nutrition security, it is imperative for Asian governments to undertake concerted national action and that these actions be both strengthened and supplemented by international efforts in the region. In keeping with their commitments at two world conferences, the *International Conference on Nutrition (ICN)* in 1992 and the more recent *World Food Summit (WFS)* in 1996, Asian governments assumed responsibility for undertaking the following actions:

- To ensure an enabling political, social and economic environment, designed to create the best conditions for eradication of poverty based on the full and equal participation of women and men, in order to achieve sustainable food security for all;
- To implement policies for eradication of poverty and inequality, and for improving physical and economic access by all, at all times to sufficient, nutritionally adequate and safe food and its effective utilization;
- To pursue participatory and sustainable food, agriculture, fisheries, forestry and rural development policies and practices which are essential for adequate and reliable food supplies at various levels;
- To strive to ensure that food, agriculture trade and overall trade policies are conducive to fostering food security for all through a fair and market oriented system;
- To endeavour to prevent and be prepared for natural and man-made disasters and to meet transitory and emergency food requirements;
- To promote optimal allocation and use of private and public investments to foster
- human resources and sustainable food and agriculture; and
- To implement, monitor and follow-up efforts to implement these actions at all levels in co-operation with the international community.

In keeping with these commitments, it becomes essential to translate them into effective intervention. Designing effective strategies and measures to enhance Asian prospects beyond 2000 flows from an elaboration of the current situation. It needs to examine the food and nutrition security situation of Asian countries and then furnish an elaboration on comprehensive policy frameworks leading to programme and project intervention. These activities need to take account of socio-economic priorities and concerns and identify appropriate responses to the socio-cultural diversity in Asian countries. This combination of activities not only supports the design of effective initiatives and interventions, it also serves as the catalyst for further and sustained actions by Asian governments. Therefore, after exploring the linkages between the twin pillars of food security and nutritional security (Section II), this publication then probes major indicators of Asia's nutrition scenario as current trends and prospects beyond 2000 (Section III). This scenario is supplemented by national trends in South Asian and South East Asian countries (Appendices VIII.A and B). The nutritional transition underway in Asian countries is taken into account (Section IV), followed by identification of components for a policy framework to design national strategies and measures as support for policy, programme and project intervention (Section V). An exposition of interventions by Asian countries supplements the presentation (Appendices VIII.C and D). Substantive discussions also examine

strategies and measures for achieving nutritional security in emergency situations and during the present economic crisis underway in many Asian countries. Enhancing Asian prospects is the final focus of the publication (Section VI). The forthcoming discussion examines the evolution of international standards for ensuring safe and nutritious food for every person, household, community and nation.

D. International Standards for Safe and Nutritious Food

The expansion in international trade in food has increased the risk from cross-border transmission of infectious agents and underscores the need to use international risk assessment to estimate the risk that microbial pathogens pose to human health. The globalization and liberalization of world food trade, while offering many benefits and opportunities, also presents new risks. Ensuring safe food that will not cause harm to the consumer, thus, requires enhanced levels of inter-governmental co-operation in setting international standards. This co-operation is featured in a wide range of undertakings, codes, standards, guidelines, recommendations and conventions adopted by member states of the FAO at its Council/Conference following formulation and negotiation through its Commissions.

The most important instruments evolve from the *Codex Alimentarius* Commission (CAC) as the implementation agency for the Joint FAO/WHO Food Standards Programme. It was established as an inter-governmental statutory body of FAO and WHO in 1962, with 165 member states at present (see Table 2 below for members in Asia and Pacific region). *Codex Alimentarius* (a Latin term for food law or food code) brings together scientists, technical experts, governments, consumers, and industry representatives to develop international standards for food production, processing and trade. It is supported by expert committees working on a range of topics; namely, food additives and contaminants, residues of veterinary drug in foods, pesticide residues, food hygiene, general principles, food labeling, food import and export inspection and certification systems, nutrition and foods for special dietary uses, methods of analysis and sampling and meat hygiene.

The *Codex* Standards are designed to meet two objectives; namely, ensuring consumers health, and supporting fair practices in the food trade, albeit domestic exchange or export. Since its formation in 1962, the range of Standards developed by the CAC covers all foods, whether processed, semi-processed or raw, intended for sale to the consumer or for intermediate processing. Over 200 Standards, 45 Codes of Practice and 2000 Maximum Limits for residue of agricultural and veterinary chemicals have been established.

The growing significance of the *Codex Alimentarius* Commission is attributed to two agreements arising from the Uruguay Round of Multilateral Trade Negotiations, which has established a new World Trade Organization (WTO). These agreements now furnish provisions governing the export of safe food and food products for the 134 member states of WTO, see Table 2 above. Negotiations on reducing non-tariff barriers to international trade in agricultural products flow from *Application of Sanitary and Phytosanitary Measures*, known as the SPS Agreement, and *Technical Barriers to Trade*, known as the TBT Agreement.

The *SPS agreement* requires WTO members to conduct science-based risk assessments, in setting limits for health risks in foods. It applies to all measures that countries put in place to protect their human, animal and plant life or health, and which may directly or indirectly affect international trade. Essentially, SPS measures are food safety and animal and plant quarantine measures.

Table 2. Member States of the Food and Agriculture Organization of United Nations in Asia and the Pacific (FAO, RAP) and of the Codex Alimentarius Commission (CAC) and the World Trade Organization (WTO), June 1999

FAO member states	Codex CAC members	WTO members, or Date applied*
Australia	yes	yes
Bangladesh	yes	yes
Bhutan	yes	NO
Cambodia	yes	NO December 1994
China	yes	NO March 1987
Cook Islands	yes	NO
Dem. P.R. of Korea	yes	NO
Fiji	yes	yes
India	yes	yes
Indonesia	yes	yes
Iran	yes	NO
Japan	yes	yes
Kazakhstan	NO	NO February 1996
Korea, Republic of	yes	yes
Lao People's Dem. Rep.	yes	NO February 1998
Malaysia	yes	yes
Maldives	NO	yes
Mongolia	yes	NO
Myanmar	yes	yes
Nepal	yes	NO June 1987
New Zealand	yes	yes
Pakistan	yes	yes
Papua New Guinea	yes	yes
Philippines	yes	yes
Samoa	yes	yes
Solomon Islands	yes	yes
Sri Lanka	yes	yes
Thailand	yes	yes
Tonga	yes	yes
Vanuatu	yes	NO July 1995
Viet Nam	yes	NO January 1995

Source: FAO and WTO Home Pages, April 1999;

Note: * = WTO Working Party established for accession.

The SPS contains specific references to the standards, guidelines and recommendations established by the Codex Commission relating to food additives, residues of veterinary drugs and pesticides, contaminants, methods of sampling and analysis, and codes and guidelines of hygienic practice.

The TBT Agreement was developed to prevent the use of national or regional technical requirements, or standards in general, as unjustified technical barriers to trade. Since TBT covers all types of standards, the agreement extends coverage to all aspects of food standards other than those related to SPS measures; such as quality provisions, nutritional requirements, labeling and methods of analysis. TBT also contains a very large number of measures designed to protect consumers against deception and fraud.

Codex Standards, thus, serves as a point of reference in international law and increasing demands are being made on it in response to the need for harmonising these international agreements with emphasis to scientific rigour and transparency. *Codex* standards and guidelines also are responsive to worldwide concerns about increasing food safety and quality of domestic and imported food for achieving nutritional security.

Other FAO activities supplement and support the formulation of international standards for food quality and food safety. For example, *the Joint FAO/WHO Expert Committee on Food Additives (JECFA)* has been in existence since 1955 and serves as a scientific advisory committee to FAO, WHO, Member Governments and the *Codex Alimentarius* Commission. The JECFA assesses the human health risks associated with the consumption of *additives* to food. Based on these assessments, it recommends Acceptable Daily Intake (ADI) levels, tolerable limits for environmental and industrial chemical contaminants in food and Maximum Residue Levels (MRL) of agricultural chemical inputs in food.

Supplementing *Codex* standards, member states of the FAO have adopted a series of *international instruments* dealing directly or indirectly with *biosafety and biotechnology* (FAO/WHO Joint Consultations 1990 and 1996, Lupien 1999). Beginning in 1983, member states of the FAO Conference adopted the International Code of Conduct for Plant Germplasm Collecting and Transfer, formulated by the Commission on Genetic Resources for Food and Agriculture (CGRFA). Nearly a decade later, the FAO Council endorsed the Draft Code of Conduct for Biotechnology as it affects the Conservation and Use of Plant Genetic Resources. Formulated by the CGRFA in consultation with 400 experts worldwide in 1991, this code is designed to minimize the negative effects of biotechnology. Shortly thereafter in 1995, the CGRFA considered the Draft Code of Conduct for Plant Biotechnology and undertook negotiations leading to revision of the International Undertaking on Plant Genetic Resources.

Conventions furnish the most powerful international instruments, being an important commitment among member states to implementation of their provisions. Adopted in 1992, the *Convention on Biological Diversity (CBD)* covers biosafety involving any technological application that uses biological systems, living organisms or derivatives thereof, to make or modify products or processes for specific uses. It also covers tissue cultures, immunological techniques, molecular genetics and recombinant DNA techniques. The FAO Conference adopted *the International Undertaking on Plant Genetic Resources* in 1983 and, thereafter, 113 member states have adhered to its provisions. Revision of this undertaking in harmony with the convention is being negotiated through CGRFA, among its 158 member states, including Asian countries.

II. LINKING THE TWIN PILLARS

A. Availability and Accessibility

Ensuring the *availability* of food requires that enough food is either produced or imported as components of the national food supply, measured as the Dietary Energy Supply (DES) in terms of Calories available per day for every person in the total population. Achieving national food security is only the first step towards achieving food security. Designing policy frameworks to furnish support for this first step needs to incorporate strategies and measures simultaneously ensuring *accessibility* of food, whereby all people have access to food in both the quantities and the qualities required to support an active, productive and healthy life. Simultaneous enhancement of availability and accessibility requires consideration be given to examination of the socio-economic aspects of relationships linking the twin pillars of food security and nutritional security.

The Nobel prize winning contributions of Amartya Sen highlight the importance of such linkages. His analysis of famines around the world points out that they occur not because food is not available, but due to non-accessibility to the food. Sen not only analyses the socio-economic factors linking these twin pillars, he calls for the design and implementation of socio-economic policies responding to *inadequate linkages*, with emphasis to ensuring access to food by people *without access*, or with *insufficient access*, to food from home production or on the market. Food-for-work programmes and soup kitchens furnish illustrations as they were designed in response to insufficient employment and income for procuring sufficient qualities and quantities of food. Their design facilitates the linkage of *socio-economic factors* limiting access to food and, in the process of design, food and nutrition security come to be viewed as intricately linked through both employment and income.

Linking the twin pillars of food security and nutrition security thus implies access of food in sufficient quantities and of appropriate quality at all times to all people for nutritional well-being, but this linkage is yet to be fully achieved in Asia. This section thus introduces some of the major features of policy interventions designed in response to inadequate linkages between access to food of sufficient quantity and nutritional quality.

B. Enhancing Quantity and Quality

Achieving *sufficient quantity* for food security gives emphasis to enhancing the *quantity or availability* of food. As previously shown (see Table 1), DES figures clearly indicate that even though enough food is available in the world, at least 828 million people in the developing countries continue to experience inadequate access to this food (see Figure 2). The overwhelming majority of people experiencing inadequate access live in developing Asian countries, despite major progress with respect to food availability. This national progress also flows from *urban agriculture* as a contribution to household food security in many Asian cities. For example, urban farmers link national and household food security to nutrition security by growing up to 50 per cent of the vegetables consumed in Karachi and 85 per cent in Shanghai (WHO 1998).

In contrast to this quantitative focus, nutritional security also highlights the *quality* of food. Linking these twin pillars thus embraces the quantitative and qualitative dimensions of food supply and consumption and, thereby, achieving nutritional security flows from food security. As a consequence of their intrinsic linkage, nutritional security is not merely linked to availability and access, but also to the appropriate amount and type of nutrients (*variety of foods or food*

groups consumed), as well as the quality and safety of food consumed. Biotechnological processes, particularly genetic modification, is not only important in devising new ways to increase food production, it also contributes to improve nutrient content and storage characteristics and, as such, promises benefits to improved quality of available food.

Food-based approaches are the most effective strategies for overcoming *micronutrient deficiencies*, but some micronutrients are not always present or available naturally in sufficient amounts. This can be due to lack of iodine in the soil where crops are grown, or in the case of other micronutrients such as iron or vitamin A, due to problems of bioavailability, unbalanced diets or intestinal parasites. *Food fortification* thus becomes an essential element in nutrition strategies to alleviate micronutrient deficiencies (FAO 1995). Fortification techniques for iodine, iron, and vitamins A, D, C, E and B complex are widely used to enhance food quality.

Food safety is viewed as an essential quality of food. Despite scientific progress, contaminated food (including water) remains a major public health problem. Foodborne diseases are common in many countries, and children are the most frequent victim, experiencing diarrhea leading to underweight and wasting, and unacceptably high levels of child mortality. When unsafe food enters the international market through export trade, the results translate into global actions and substantial losses, arising from the combination of food spoilage, illness and even death, legal actions and trade curtailment, product recall and loss of product credibility.

Hygienic practices in food handling, processing, transport and storage thus have gained importance as consumers depend more on foods produced and processed away from the household. A worldwide initiative on food safety is becoming an indispensable feature of trade liberalisation. *Codex Standards*, though not binding on Member States, are a point of reference in international law and can provide support for the processing of safe food for sale on the domestic market or as food exports. Their implementation involves ensuring a sound, wholesome product free from adulteration, correctly labeled and presented.

Inadequacies in the national *food control system* at any or all stages in the production-consumption chain have cumulative contribution to the deterioration of food quality. This results not only in economic losses on the part of industry and government; lost reputation on the part of the producer, but also to social development setbacks for the health and nutrition when the expected impact, in terms of benefits, is not realized. Major obstacles to implementation of adequate food control systems occur when material sourcing, production, packaging, storage, transport conditions and delivery systems are below optimal levels for ensuring food safety. Raw materials of poor and variable quality, processing equipment that is unreliable or poorly fabricated, and inadequate manufacturing and marketing facilities also contribute to poor quality in food products.

C. Socio-Economic and Socio-Cultural Dimensions

Achieving nutritional security means more than overcoming undernutrition and ill-balanced diets. It also requires serious attention to the socio-economic and socio-cultural dimensions of these twin pillars. Successful interventions to enhance Asian prospects flow from efforts to promote the participation of people, traditional diets and integrated rural development, as illustrated by the following examples.

People's participation is increasingly viewed as a major component of effective policy and programme design. It is often recognized an essential feature of technical guidance and resource generation, but socio-economic and socio-cultural factors either limit or contribute to

programming efforts in other areas. While there is urgent need for introduction of science and technology, farm households must be informed and convinced about their potential benefits for increasing productivity in conjunction with enhancing the quality of life. Changing attitudes and behaviours is necessary support for introduction of any change and, as a result, interventions are only successful if the direct involvement of farm households is ensured. The success of these strategies thus requires the involvement and active participation of the entire rural household, and especially of rural women whose contributions often go unrecognised and whose potential is frequently ignored.

Asian rural women furnish major linkages between the twin pillars of food and nutritional security. In most rural households in Asian countries, women are simultaneously responsible for growing a variety of vegetables, roots and fruits; and for raising small animals, such as chicken, goats, sheep, rabbits and pigs. They are solely responsible for a wide variety of processing activities associated with these food products as well as for milking and the processing of dairy products. Throughout Asia, women are almost exclusively responsible for several important steps in the food and nutrition chain, particularly food processing, preparation and distribution, including cooking and feeding family members at the household level. As a result, women are increasingly recognized as essential to achieving food and nutrition security in households, communities and countries such as China and Thailand (UN/ACC/SCN, 1989). A focus on women is strategically important because they bear children, raise them and largely educate them. Women are also particularly responsible for feeding the family and are in fact gatekeepers of the health and nutrition of the family. This nutritional scenario not only suggests survival of LBW girls as adult women experiencing higher levels of morbidity and mortality, but the likelihood of undernourished pregnant women through premature birth transferring the deficits of undernutrition to another generation of LBW infants and survivors. The potential for this intergenerational cycle of nutritional insecurity is greatest among people living in poverty, and especially in the low income, food deficit countries (LIFDCs), like Bangladesh and Nepal. As suggested by the linkage of maternal undernutrition and mortality to anaemia, this intergenerational cycle of nutritional insecurity not only results from insufficient access to sufficient food, it also flows from micronutrient deficiencies.

The participation of rural women is especially important to the linkage between food security and nutritional security of *poor households, communities and nations*. These linkages need priority attention in the *Low-Income-Food-Deficit countries (LIFDCs)*, such as Bangladesh, Bhutan, Cambodia, China, India, Indonesia, People's Democratic Republic of Korea, Lao PDR, Mongolia, Pakistan and the Philippines. These LIFDCs not only have an inadequate food supply to feed their hungry population, but their low income limits their ability to import food to make up the deficit. The poorest among the poor in Asian countries are rural women. Promoting and strengthening their involvement ensures a secure food supply and reduces the risk of seasonal food scarcity.

Traditional Diets of rural households often are not only well balanced but also easily adapted to changing nutritional needs. The knowledge of methods for food production and food preparation is part of the socio-cultural contributions of women. Throughout Asian countries, mothers assume major responsibility for teaching daughters about food preferences, practices and nutritional benefits as the food component of the diverse socio-cultural traditions in Asian countries. Research findings highlight the nutritional benefits of traditional methods for processing and preserving foods and, thus, there is a need for strengthening the traditional aspect of Asian diets through the active involvement of women and children, especially girls. For example, the widespread practices of steaming staples wrapped in green leaves and of fermentation processes adds to the value of basic foods (Fleuret and Fleuret 1980). Appropriate

technology in the modern temperate industry in Indonesia has contributed effectively to the production of soybean and other legumes to improve the quality of cereal-based diets (Suharto 1997). Traditional processing also involves the drying and smoking of foods such as fish, vegetables, fruit and grains. The application of traditional methods to the preparation of cereal/millet based foods contributes marked improvement in their nutritional benefits (Rajyalakshmi and Geervani 1990). *Traditional processing methods* such as fermentation and parboiling yielded improvements in the B-complex content (e.g. increases of 50 per cent for thiamin and 36 per cent for niacin) and enhanced availability of vitamins and minerals. Other traditional processing methods like germination, dry-puffing, roasting and fermentation improve protein quality by destroying anti-nutritional factors (Padmashree *et. al* 1987).

Integrated rural development offers another perspective, which in the context of rural development in Asia, has immense potential for improving the prospects of food security and nutrition security beyond 2000. An integrated approach to rural development embraces food production, processing and dissemination; services such as credit and agricultural advice; and safe storage and marketing practices. Adding people's participation to this approach yields a multi-disciplinary approach to rural development recording immense success in rural communities. As a result of this combination, there is a shift in policy orientation towards the involvement of people, especially of women. Programme development for rural community food farming systems thus combine activities associated production, processing and storage with community participation and nutrition education to facilitate ensuring adequate food and nutrition throughout the year. Integrated rural development strategies investing in human resource development are essential, but these need to be supplemented by intersectoral mechanisms that assist governments with identification of priorities, and that take account, in an Asian context, of the potential for human resources development in agriculture and rural communities. Designing effective policy frameworks linking these twin pillars of food security and nutritional security will flow from examination of the current nutritional scenario.