



INTERNATIONAL CONFERENCE ON NUTRITION



**Nutrition and development
— a global assessment**

1992



INTERNATIONAL CONFERENCE ON NUTRITION

Nutrition and development – a global assessment

1992



FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS



WORLD HEALTH
ORGANIZATION

Revised edition, 1992

The designations employed and 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 and the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Material from this document may be reprinted provided the credit line reads "Reprinted from *International Conference on Nutrition: Nutrition and development – a global assessment – 1992 (revised edition)*".

© FAO and WHO, 1992

Printed in Italy

Contents

SUMMARY	vii
Chapter 1	
SCOPE AND DIMENSION OF NUTRITION PROBLEMS	1
The magnitude and trends of nutrition problems	3
Consequences of poor nutrition	25
Bibliography	27
Chapter 2	
FACTORS INFLUENCING NUTRITIONAL STATUS	29
Food and nutrition	32
Health and nutrition	36
Care and nutrition	41
Bibliography	46
Chapter 3	
DEVELOPMENT POLICIES AND NUTRITION	47
Economic growth and macro-economic policies and nutrition	50
Agricultural policies and nutrition	52
Health policies and nutrition	55
Environmental policies and nutrition	58
Population policies, urbanization and nutrition	62
The international economic environment and nutrition	66
Bibliography	70
Chapter 4	
POLICIES AND PROGRAMMES TO IMPROVE NUTRITION	71
Improving household food security	74
Protecting the consumer through improved food quality and safety	79
Preventing specific micronutrient deficiencies	82
Promoting healthy diets and lifestyles	85
Preventing and managing infectious diseases	89
Caring for the socio-economically deprived and nutritionally vulnerable	92
Assessing, analysing and monitoring nutrition situations	96
Bibliography	102
Chapter 5	
MEETING THE NUTRITION CHALLENGE	103
Principles for incorporating nutrition into development	106
Approaches to action	110
Concluding remarks	120
Bibliography	121

Tables

Table 1 Per caput DES by region or economic group	5
Table 2 Estimate of chronic undernutrition in developing regions for 1969-71, 1979-81 and 1988-90	6
Table 3 Prevalence and number of underweight children under five years of age by region	9
Table 4 Population at risk of and affected by micronutrient malnutrition	15
Table 5 Change of various parameters in countries with decreasing or increasing mortality between 1960 and 1985	19
Table 6 Associations between selected dietary components, body weight and cancer	24

Figures

Figure 1 Change in dietary energy supply by region	4
Figure 2 Estimate of chronically undernourished in developing regions (number and percentage of total population)	7
Figure 3 Trends in numbers of underweight children for each region	10
Figure 4 Trends in percent prevalence of underweight children for each region	10
Figure 5 Infant mortality rate	13
Figure 6 Under-five mortality rate (probability of dying before age five), 1991	13
Figure 7 Percentage change in mortality rates due to diet-related non-communicable diseases	17
Figure 8 Average age-specific death rates from diet-related non-communicable diseases	18
Figure 9 Estimated distribution of causes of death, 1990	20
Figure 10 Prevalence of overweight in pre-school children	23

Summary

1. The objective of eradicating hunger and malnutrition and the consequent human suffering is within the reach of humanity. However, reaching this goal remains as great a challenge today as in the past. To meet this global challenge, full commitment and concerted action are needed on the part of all concerned — governments, non-governmental organizations (NGOs), local communities, the private sector and the international community, including international organizations.

2. The present document, *Nutrition and development — a global assessment*, analyses the latest available information and data and considers a wide range of expert opinions on nutritional problems worldwide. It also draws on the conclusions and findings of the intensive consultative process initiated for the International Conference on Nutrition (ICN). This process has included activities at the country level, focusing on the preparation of country papers, and at the regional level through a series of eight regional ICN preparatory meetings.

3. The document assesses the nature and the magnitude of the nutritional problems in both developing and developed countries. It also analyses the causal factors, under the three categories of food, health and care, and considers the broader policies and programmes that have an impact on the nutritional well-being of the population. Finally, the document considers possible lines of actions and basic strategies that need to be implemented, primarily at the country level, with the active support of all concerned in order to bring food security and health within the reach of everyone.

SCOPE AND DIMENSION OF NUTRITION PROBLEMS

4. Hunger and malnutrition remain the most devastating problems facing the majority of the world's poor. Despite general improvements in food availability, health and social services, hunger and malnutrition exist in some form in almost every country. No one can doubt the seriousness of this problem which afflicts millions of human beings. One out of five persons in the developing world is chronically undernourished, 192 million children suffer from protein-energy malnutrition and over 2 000 million experience micronutrient deficiencies. In addition, diet-related non-communicable diseases, such as obesity, cardiovascular diseases, diabetes and some forms of cancer, exist or are emerging as public health problems in many countries.

5. While these numbers and trends are alarming, progress has been made in reducing the prevalence of nutritional problems, and many countries have been remarkably successful in addressing issues of hunger and malnutrition. For the developing countries as a whole there has been a consistent decline during the last 20 years in the proportion and absolute number of chronically undernourished people. From 1969 to 1971 approximately 941 million people were chronically undernourished compared with 786 million from 1988 to 1990, representing a drop from 36 percent to 20 percent of the population of these countries. The current — and achievable — challenge is to build upon and accelerate the progress that has occurred.

6. Dietary energy supplies in developing countries continued to increase in the 1980s although at a slower rate than in the previous decade. According to FAO estimates, the food supply in 1988-90 would have been enough to meet the energy needs of the world's people if it had been distributed according to individual requirements. By the end of the 1980s roughly 60 percent of the world's population was living in countries that had more than 2 600 kcal available per person per day. At the same time, however, there were 11 countries, mostly in sub-Saharan Africa, with a combined population of 123 million, where dietary energy supplies were grossly insufficient at less than 2 000 kcal per person per day.

7. Protein-energy malnutrition, as assessed by physical growth and body measurements, is still widespread throughout the world, primarily among children. Approximately 192 million children under five years of age are suffering from acute or chronic protein-energy malnutrition. This average number increases during the annual periods of food shortage in many developing countries and in times of famine and social unrest.
8. The percentage of underweight children under five years of age has been declining in all continents over the last 15 years, but the absolute numbers have remained fairly stable as a result of population increases. The number of underweight children was the highest in Asia (155 million), although this number is now declining. However, the number of underweight children in Africa increased from 20 million in 1975 to 27 million in 1990.
9. Mortality rates for children under five years of age have also declined in nearly all developing countries in the last 15 years. The mortality rates for this age group, which are correlated with underweight status, are much higher in the developing countries (120 deaths per 1 000 live births), particularly in the least developed countries (200 deaths per 1 000 live births), than in developed countries (20 deaths per 1 000 live births).
10. The percentage of low-birth-weight (LBW) infants (less than or equal to 2.5 kg) is an indicator of foetal undernutrition resulting from maternal undernutrition or infections. The prevalence of LBW infants in 1991 was over 6 percent in developed countries but nearly 19 percent in developing countries, with very high rates in Southeast Asia and Africa.
11. Among the micronutrient deficiencies, the most prevalent are lack of iron (over 2 000 million affected), lack of iodine (over 1 000 million at risk) and insufficient vitamin A (40 million affected). Iodine deficiency is found worldwide, particularly in populations located in mountainous or flood-prone areas where soils are deficient in iodine. Over 200 million people have goitres, 26 million have mental defects and 6 million are cretins. Vitamin A deficiency occurs especially in areas where fruit and vegetable consumption and sometimes fat intake are low. Iron deficiency is widespread, primarily affecting pregnant women, women of child-bearing age and young children. In many developing countries, 50 percent of these segments of the population are affected by such deficiencies.
12. Various other micronutrient deficiencies, caused by a lack of zinc, selenium and other trace elements, affect large numbers of people in some parts of the world. Outbreaks of classical deficiency diseases – beriberi, pellagra and scurvy – still occur in refugee camps and other deprived populations, and rickets affects significant numbers of children.
13. Changes in diet and lifestyle associated with urbanization, higher incomes and longevity have led to the emergence of diet-related non-communicable diseases as major problems. These include obesity, cardiovascular diseases, diabetes mellitus (type 2; non-insulin-dependent), 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) along with heredity factors have been established.
14. With the initiation of educational efforts to reduce such risk factors, and improved medical care and health screening, the prevalence of these diseases has been declining in many European countries and in North America, Japan and Australia over the last 15 years. Data from 26 developed and 16 developing countries (mostly in the lower middle-income group) showed that the age-specific mortality rates for groups within the age range of 45 to 54 years and that of 55 to 64 years were almost the same in both developed and developing countries. The rate was higher for those over 65 years of age in developed countries – however, this gap is narrowing. Countries in eastern Europe and several developing countries show increasing mortality rates for these disorders. The increasing mortality rates are associated with high rates of urbanization and increases in dietary intake, notably in total and saturated fat. Recent evidence suggests that changes in diet and lifestyle may reverse the damage of partially blocked coronary arteries.

15. Obesity is closely linked to cardiovascular diseases, including hypertension, and diabetes. Higher salt intakes are associated with the more rapid rise in blood pressure that comes with ageing in some populations. Diabetes can be triggered by various factors including dietary patterns and lifestyles similar to those associated with high risk of cardiovascular diseases. Diabetes and heart disease in later life appear to be linked to weight at birth. Diets high in fat, particularly saturated fat, are associated with a higher incidence of cancer of the colon, prostate and breast. Diets high in plant foods, starches, fibre and (pro)vitamin A are commonly associated with a lower incidence of alimentary tract cancers. However, these associations have not been proven to be causal relationships.

16. The consequences of malnutrition for human well-being and for socio-economic development are varied and far-reaching. In infants and young children, undernutrition and growth retardation are associated with reduced physical activity, lowered resistance to infection, impaired intellectual development and cognitive abilities and increased morbidity and mortality. Low birth weight, itself commonly a result of maternal malnutrition, is associated with impairment of subsequent growth performance and high neonatal and infant mortality.

17. Severe or moderate iodine deficiency during pregnancy or early childhood can lead to neurological or hypothyroid cretinism – resulting in deaf mutism, impaired motor coordination, growth failure or severe mental defects – and increased rates of abortion and stillbirths. Vitamin A deficiency is the most common cause of preventable childhood blindness. It also leads to night blindness, decreased resistance to infections and increased morbidity and mortality rates from various infections, especially diarrhoeal and respiratory infections, and measles.

18. In women, poor nutritional status is associated with an increased prevalence of anaemia, pregnancy and delivery problems and increased rates of intra-uterine growth retardation, low birth weight and perinatal mortality. In adults, undernourishment and anaemia can lead to poor health and productivity, resulting in impaired physical and intellectual performance, which can constrain community and national development.

FACTORS INFLUENCING NUTRITIONAL STATUS

19. Nutritional status is affected by a wide range of factors that may lead to inadequate or excessive nutrient intakes or may impair their optimal utilization. The factors most directly influencing nutrition are analysed under the categories of food, health and care. Each of these is essential for good nutrition and they can often influence each other. Development policies, though usually not included in the domain of nutrition as such, can also affect nutritional well-being.

20. It should be stressed that poverty is the root cause of malnutrition. Acute and chronic undernutrition and most micronutrient deficiencies primarily affect the poor and deprived people who do not have access to adequate food, live in unsanitary environments without access to clean water and basic services and lack access to appropriate education and information. On the other hand, overnutrition and dietary imbalances, which can lead to diet-related non-communicable diseases, cut across socio-economic boundaries, although historically they are related to higher incomes and living standards.

21. **Food and nutrition.** Nutritional well-being is influenced by the nutrient content of foods consumed in relation to requirements. Requirements are determined by various factors such as age, sex, body size, physical activity, growth, pregnancy and lactation, infections and the efficiency of nutrient utilization.

22. Stable food availability at the national, regional and household levels is a cornerstone of nutritional well-being. At the household level, food security implies having physical and economic access to foods that are adequate in terms of quantity, quality and safety.

Household food security depends on an adequate income and assets, including the amount and quality of land owned.

23. In developing countries, where approximately two-thirds of the population live in rural areas, crop and animal production, fisheries and forestry activities are direct sources of food and provide income with which to buy food. Increased production of food for family consumption or as a source of income helps to stabilize food prices and improve nutrition. Improved marketing facilities can also contribute to food security.

24. In urban areas poverty and unemployment, as well as the poor quality of housing, health and education, are important factors affecting nutrition. The degree to which increased income is transformed into improved food consumption and family care depends also on education and socio-cultural factors. When the mother has a controlling hand in household expenditures, children's nutrition is generally better.

25. The seasonality of production in developing countries influences access to food. The pre-harvest season, which is often characterized by food shortages, usually coincides with the year's highest farm workload and greatest incidence of infectious diseases, especially malaria and diarrhoeal diseases. The growing of cash crops is found to influence access to food positively more often than negatively. Agricultural practices and technology can significantly affect nutrition through various mechanisms such as employment and income generation, energy expenditures, use of time and effects on the environment and health.

26. Food safety and quality have an important influence on nutrition. To ensure that food is safe and that food quality is maintained during production, handling, processing and packaging, an effective food quality control system is necessary. Microbial and chemical contamination, including pesticide residues, can have serious consequences. Hygienic handling of foods, especially those used for infants, can contribute significantly to food safety and nutrition.

27. **Health and nutrition.** Various infections — notably diarrhoeal and respiratory diseases, measles, malaria, intestinal parasites and AIDS — have a major impact on nutritional status. The interaction of infection and inadequate food consumption causing growth retardation in children leads to a vicious circle: the malnutrition-infection complex. Poorly nourished persons are more susceptible to many infections and their infections are often more severe and prolonged. Infections are themselves deleterious to nutritional status, causing reduced appetite and food intake and increased metabolic demands and nutrient losses. Water- and food-borne diarrhoeal diseases are the most significant problems. Micronutrient deficiencies, especially of iron and vitamin A, reduce resistance to infections while infections and parasitic infestations impair micronutrient status.

28. It is necessary to improve environmental health conditions to break the malnutrition-infection complex. This includes addressing problems of contaminated water, insanitary disposal of human and household wastes and poor food and personal hygiene in homes and in places of food processing and marketing.

29. Health services contribute to improved nutritional well-being: immunizations prevent disease; curative services shorten disease episodes; and oral rehydration therapy reduces the severity and consequences of diarrhoeal disease. Strengthened health services can more effectively promote breast-feeding, proper weaning practices and home care, as well as the feeding of sick children; provide adequate antenatal care, nutritional counselling and birth attendance services; undertake nutrition education; and develop and support appropriate strategies to prevent micronutrient deficiencies.

30. Poor availability and utilization of health services, particularly at the primary (local) level, is an important factor contributing to malnutrition, especially in young children. Without such services adequate prevention and management of infectious diseases will not be achieved. Primary health care services at the community level, run by and for the

communities, play an important role in minimizing risk of undernutrition. The development of such community-based health care depends on the degree of development of local government, the decentralization of responsibilities and the management of community affairs by the community itself.

31. Excessive or unbalanced diets, often coupled with unhealthy lifestyles, such as inadequate physical exercise, stress and abuse of alcohol and tobacco, also contribute to poor health and lead to the increased incidence of diet-related non-communicable diseases. These include obesity, hypertension and stroke, cardiovascular disease, diabetes mellitus and some cancers. Although most often found among affluent populations, these diseases are becoming common among all income groups of industrialized countries and in the upper- and middle-income groups of developing countries.

32. **Care and nutrition.** Care and sound feeding practices are essential elements of good nutrition and health. Malnutrition can occur even when a household has access to adequate amounts and types of food as well as access to appropriate sanitation and health services. While adequate incomes, greater food availability and expanded health services are necessary for improved nutrition, these will not bring about improvements unless households are able to take advantage of them.

33. In this context, care assumes critical importance. Care consists of the provision in the household and the community of time, attention and support to meet the physical, mental and social needs of the growing child and other family members. It leads to the optimal use of human, economic and social resources. Of particular importance is child feeding: both breast-feeding and adequate weaning practices are crucial to good nutrition, and success depends on good nurturing and emotional support by care-givers, especially the mother. Maternal education in particular is an important factor.

34. However, mothers should not be considered to be the only care-givers. Fathers, among others, also have important roles to play and their commitment and ability to provide adequate care for all household members are essential for nutritional well-being. It should be noted, however, that in many countries it is the hard-pressed and time-consuming nature of the mother's activities that is the major determinant of the types of food eaten, the ways in which it is prepared and the amount of emotional support and response that is given to the needs of young children.

35. Strengthening the family, the social and economic unit most responsible for nutritional well-being, is essential. Such an effort must consider the roles, knowledge and motivation of household members, as well as their time constraints, and the control of income and other resources within the household. In many instances, it is especially important to ensure that women have access to the resources and education they need to better care for themselves and their families.

36. At the community level, adequate organization and caring capacity is an important determinant of nutritional status of vulnerable groups, both directly – by a community assessing its own problems and deciding on appropriate action — and indirectly – through a community's capacity to survive in a hostile ecological or economic environment. In either case, efforts by communities to address their own problems should be encouraged and supported. Increased attention to developing new community care structures may also be needed as urbanization and other social forces weaken traditional patterns of family and community care. Such caring is undertaken through various voluntary and social welfare organizations. Other mechanisms include feeding programmes, food subsidies, social security systems and so forth.

37. In addition to the ability of the household to take care of family members, the nutritional well-being of disadvantaged and vulnerable groups may also depend on

society's capacity and willingness to assist them. Destitute individuals, refugees and displaced persons are particular examples of groups that are dependent on outside assistance to meet their nutritional needs.

DEVELOPMENT POLICIES AND NUTRITION

38. National development policies and strategies can have an important bearing on the nutritional status of the population. Since many of the basic causes of malnutrition lie outside the immediate field of nutrition, the most effective governmental strategies to reduce malnutrition on a national scale have been those that focus on growth with equity.

39. The effects of developmental policies on nutrition can be positive or negative. Maximizing the positive nutritional impacts of development policies both at the national level and in different sectors can significantly contribute to improving nutritional status. At the same time, to ensure an adequate impact from specific nutritional interventions, a favourable environment in terms of both overall development policies and sectoral policies is required. Development policies may influence nutrition through one or all of the types of factors, food, health and care.

40. Economic growth, by increasing incomes, can bring nutritional benefits in many ways, both directly and indirectly. With some exceptions, there is a strong positive relationship between per caput income and welfare indicators. However, economic growth does not improve nutrition automatically. There is a strong case in favour of emphasizing equity together with growth as an integral part of a development strategy. Equity and economic growth are not incompatible, in fact, they work best when carried out together. It is most important to ensure that the real incomes of the poor and the vulnerable groups increase significantly as growth occurs.

41. Macro-economic policies can positively or negatively affect different population groups; for instance, if such policies discriminate against the food and agriculture sector, or result in reductions in health services, nutrition can be adversely affected. In most cases the burden of adjustment falls disproportionately on the poor and nutritionally vulnerable.

42. The issue is not whether adjustment is needed because in the long run it is the poor who would suffer most if macro-economic imbalances were to continue. "Safety nets" need to be designed by making economic and social adjustments together and by improving the targeting of interventions for the poor. At the same time, compensatory programmes (e.g. supplementary feeding, expanded health care and income-generating programmes) may be required to help relieve the negative effects on the poor when they occur.

43. Agricultural policies can positively affect nutrition through improved food production, availability, processing and marketing, as well as through increased employment opportunities. Agricultural policies can also have an impact on time, labour and energy utilization, environmental and living conditions and the nutrient content of foods that are produced. As well, they may affect the roles of men and women, which in turn can have nutritional consequences. The impact of growing cash crops rather than food crops, as well as that of new agricultural technologies, must be assessed carefully.

44. Utilization and further development of traditional foods, improved post-harvest management and food storage and development of marketing facilities can also bring nutritional benefits. Policies determining access to land and land tenure are important in many parts of the world. From a nutrition perspective the need is to determine who will be affected and to what degree by various agricultural policies and then to try to ensure that the poor and malnourished also benefit and that any negative effects on them are minimized.

45. In many rural areas, the overriding nutritional problems are more closely associated with a shortage of jobs than with a shortage of food. Often, the most pressing need is for

employment creation, both on the farm and off the farm, through activities related to agriculture.

46. Primary health care is the universally adopted strategy for attaining health for all, including nutritional well-being. In practice, however, the food and nutrition component of primary health care programmes is often weak. The other essential elements of primary health care also contribute substantially to improved nutrition, most notably through the prevention and management of diseases, especially infectious diseases.

47. Health policies can affect nutrition through their influence on the socio-cultural and physical environments as well as through the quality and outreach of health services. Reducing the inequities in health and nutrition services, with special attention to at-risk population groups, is an important aspect of health policy. District- and community-based health programmes, and increased local financing of health services, are approaches that can readily improve local nutritional conditions.

48. Developing the human resources required at national and local levels to deal with nutritional problems more effectively is essential. Intersectoral and community-based approaches need to be promoted, along with efforts to strengthen existing capabilities of health centres and hospitals. Strengthening managerial capacity at all levels and introducing nutritional objectives into health policies and nutritional components into district and primary health care programmes are crucial strategies.

49. Environmental policies need to address the principal causes of environmental changes affecting health, food and nutrition. The physical and biological environments have a major impact on health. Population pressures in the developing world together with the daily struggle of the poor to subsist are taking a tremendous toll on the natural resources upon which survival depends.

50. Environmental policies need to deal with issues of soil degradation, erosion, deforestation, overgrazing and other unsuitable land-use practices, as well as those of fuel and energy sources, protection of the habitat, urbanization, pollution and the quality of air, water and food. Fishery resources, both marine and inland, are also threatened. Environmental problems of food contamination and water pollution resulting from unsafe and excessively intensive agricultural production methods have also increasingly become concerns in most countries.

51. Areas for action include the development of more environmentally sustainable approaches to improving food, nutrition and health; ensuring access of poor households to adequate resources so as to minimize adverse impacts on the environment; taking measures to alleviate environmental health hazards, especially food- and water-borne diseases; the promotion of patterns of sustainable living that do not threaten health or the environment; and research for the development of appropriate sustainable and environmentally sound farming systems and technologies.

52. The rapid increases in world population and urbanization present various challenges. Rising population is a critical issue in terms of food availability in many developing countries, especially those countries where populations are expected to double in the next 20 to 25 years. More people will require more food, more goods, more services and more employment opportunities. Successful policies to address population issues must include the promotion of more equitable economic development and the provision of better access to education, health and family planning services.

53. Many population policies address high fertility levels through family planning programmes designed to reduce the number of births per woman and to increase the intervals between pregnancies. Breast-feeding, especially when exclusive, delays the resumption of ovulation, thus favouring pregnancy spacing and maternal health. Nutrition,

maternal and child health and family planning services will be more successful if linked and integrated.

54. The proportion of the world's population living in urban areas increased from 39 percent in 1975 to 43 percent in 1990 and is expected to reach 51 percent by the year 2000. In general, urban populations tend to have more varied diets and better access to health and other social services than do rural populations, and they tend to be better nourished. However, in many developing countries rapid urbanization has led to severe economic, social and nutritional stresses.

55. Urban populations are not homogeneous and many urban and peri-urban groups are poorer and more malnourished than many rural populations. They have to spend a high proportion of their incomes on food, which is often of poor quality. Furthermore, they are more vulnerable to unemployment.

56. In many poor and congested urban areas the prevalence and duration of breast-feeding often decline, while at the same time increased bottle-feeding and environmental problems, including poor housing, inadequate water supplies and waste disposal and poor food hygiene, lead to increased diarrhoeal diseases. Efforts need to be made to prevent the increased incidence of non-communicable diseases arising from changing lifestyles and dietary patterns associated with urbanization.

57. In addition to population growth and urbanization, other demographic changes that can have a significant bearing on nutrition are also occurring. In particular, there has been a substantial increase in the number of older people (more than 65 years of age) in most countries. By the year 2000 it is projected that approximately 60 percent of the world's population over the age of 65 will be living in developing countries. This will have a significant impact on the demand for different types of health and social services and the health sector will have to cope with the increased incidence of non-communicable diseases that occur with ageing. The need to promote balanced diets and healthy lifestyles to prevent these diseases is clear.

58. The international economic environment affects nutrition in many ways, particularly by influencing development prospects and the resources available for all sectors affecting food, health and care. Barriers to international trade are rife and their removal can enhance foreign exchange earnings, employment and Gross National Product (GNP). However, their removal would not necessarily bring benefits to all and may be disadvantageous to some commodity sectors that benefit from existing preferential trading arrangements.

59. The agricultural policies of industrialized countries, including price supports, have significant effects on world prices and trade. They also have adverse effects on the agricultural sectors of other agricultural exporting countries. For food-deficit countries, the agricultural policies of industrialized countries can have beneficial effects in the short-run but harmful effects in the long-term. The liberalization of industrialized countries' agricultural policies can exert a generally favourable impact on the food security of developing countries overall.

60. The external debt burden of the developing countries remains critical. External debt exceeded the regional GNP in sub-Saharan Africa in 1990. The ratio of debt servicing to exports remains at a historically high level for developing countries as a whole. The net outflow of resources from developing countries to creditors totalled US\$242 billion in the period 1983 to 1989. Severe external constraints, e.g. contracting markets for their products, have largely prevented many developing countries from coping with the debt situation. Some limited debt rescheduling and even reductions have taken place recently but the overall impact has been small.

61. External development assistance could well bring nutritional as well as economic benefits. However, at the present time, it is very small compared with the development

needs and it is often not well targeted to the most needy countries or populations within countries.

POLICIES AND PROGRAMMES TO IMPROVE NUTRITION

62. Specific strategies and actions to improve nutrition should be developed according to the particular needs and circumstances prevailing in each country and to the available resources. Nonetheless, some common areas of action to protect and promote nutritional well-being can be identified. These include the following issues:

63. **Improving household food security.** The root cause of household food insecurity is poverty. Household food security depends primarily on the ability of the household to secure enough food to ensure an adequate diet for all its members at all times. Household food insecurity may be chronic, seasonal or transitory. The vulnerable groups include farmers living on marginal lands, landless or temporary labourers, pastoralists, small-scale fishermen and forestry workers and the urban poor.

64. To achieve food security it is necessary to ensure a sufficient food supply both at the national level and at the household level; to have a reasonable degree of stability in food supplies throughout the year and also from one year to the other; and to ensure that each household is able to produce or procure the food that it needs.

65. The policies chosen to achieve food security must be attuned to the characteristics of a country's food security problem, the nature of the food-insecure groups, resource availability and infrastructural and institutional capabilities.

66. In general, however, strategies for improving households food security should include: adopting overall development strategies and macro-economic policies that would create conditions for growth with equity; accelerating growth in the food and agricultural sectors and promoting rural development that focuses on the poor; improving access to land and other natural resources; providing credit for poor households; increasing employment opportunities; introducing income transfer schemes; stabilizing food supplies; improving emergency preparedness planning; providing food aid; and strengthening the coping mechanisms of households.

67. **Protecting consumers through improved food quality and safety.** Strengthening food safety and quality control systems, promoting good manufacturing practices and educating food sellers and consumers about appropriate food handling are essential to good nutrition. In addition to protecting consumers, proper food control measures reduce food losses and can stimulate world trade in food products, thus creating employment, increasing incomes and improving nutritional well-being.

68. Ensuring food quality and safety so that the public can choose a healthy diet requires comprehensive legislation, regulations and standards; the organization of effective inspection practices; and a willingness on the part of food manufacturers and processors to comply with the measures. National surveillance of food-borne diseases and monitoring of contaminants are necessary.

69. Governments can advise consumers and the food industry about good agricultural and manufacturing practices, food-handling practices, measures to minimize food spoilage and actions to avoid contamination. Through education, industry and consumers must be made aware of food laws, regulations and standards. Food and nutrition labelling regulations as well as guidelines for advertising to help consumers make more informed decisions should be established. Food quality and safety concepts should be integrated into other government-sponsored, nutrition-related programmes.

70. Low-income countries should begin building the institutional capacity to implement comprehensive food quality programmes. The important contribution food quality and safety

can make to improving access to food needs to be emphasized. Assistance in the development of infrastructure to assure adequate food control and the design of legislation and enforcement mechanisms can be provided by international agencies and countries with existing practices. In urban areas, food control procedures need to be strengthened to meet basic standards of hygiene in food preparation. Infrastructure to provide adequate water and basic sanitation are needed at both the household and commercial levels.

71. Industry's role in ensuring food quality and safety extends from agricultural production through to food services. Good agricultural practices include proper pre-harvest use of pesticides, fertilizers and veterinary drugs and post-harvest control of storage, chemical use and handling practices, as well as proper transport.

72. International organizations can provide advice and expert technical assistance on strengthening food quality and safety programmes, including the proper use of food additives and control of different contaminants in food. Member countries receive advice on developing legislation and regulations, such as those developed by the Codex Alimentarius Commission (Codex), a subsidiary body of FAO and WHO. International standards protect the health of consumers and ensure fair trade practices. Standards and codes of practice should be part of national and international food security systems to ensure the safety of food.

73. **Preventing specific micronutrient deficiencies.** The virtual elimination of iodine and vitamin A deficiencies and the substantial reduction of iron deficiency within this decade are attainable goals if concerted efforts are made urgently. Strategies and activities to tackle specific micronutrient deficiencies need to be formulated and implemented within the context of national plans to improve nutrition.

74. The basic approach should involve improving dietary diversity by stimulating the production and consumption of micronutrient-rich foods. In rural and urban areas there is great scope for improving direct household supplies of micronutrient-rich foods. Food and agricultural planning can promote the increased availability of micronutrient-rich foods and targeted nutrition education programmes can help increase their consumption.

75. A possible complementary approach is food fortification, which involves the addition of micronutrients — particularly potassium iodate, vitamin A and iron — to common foods. In developing countries, the chief problems with fortification are the cost and the means of implementation. Fortification is difficult where there are multiple small-scale producers and it requires adopting and enforcing appropriate legislation.

76. A third approach is supplementation with iodized oil (given orally or by injection), vitamin A (given in high-dose capsules or oral dispensers) and medicinal iron. Supplementation can be an effective short-term measure when it reaches target groups, but often implementation may not be systematic and coverage may be poor. Frequently, the key target groups (for instance, pregnant women and children) are different for each micronutrient and operational constraints may exist. It should only be considered as a temporary measure until long-term solutions can be implemented.

77. A fourth approach concerns public health measures and legislation. These are needed to address critical environmental factors — water quality, sanitation and food hygiene — and to promote essential services — immunization programmes, control of endemic diseases, maternal and child health (MCH), primary health care (PHC) and health education and information.

78. **Promoting appropriate diets and healthy lifestyles.** The public needs accurate information on how they may best meet their nutritional needs. Strategies that promote healthy diets provide motivation and create opportunities for people to change their behaviour while they recognize individual preferences, lifestyles and time constraints. Promoting healthy diets and lifestyles involves nutrition education and dietary guidance for

the public; training of professionals in health and agriculture; guidelines for food services; and involvement of consumer groups and food industries. The reversal of increasing trends in diet-related non-communicable diseases has been shown to be linked to these promotion efforts. The promotion of healthy diets can also have implications for farming, industrial and social policies and international trade.

79. Dietary guidelines have been issued in some countries as have recommended dietary allowances for the population. Dietary guidance statements for the public provide advice on creating a balanced diet and encourage lifestyle behaviours to promote health, taking into account the food supply, environment and economic, social and cultural characteristics of different population groups. A WHO Study Group (1990) recommended that population nutrient goals be adopted as general planning tools. The FAO/WHO Codex Alimentarius Commission has developed, for consideration by governments, guidelines on nutrition labelling.

80. Generally, nutrition education has been effective when behaviour modification, rather than information diffusion, was the goal. Social learning, social marketing and use of entertaining educational messages for mass communication have been successful in improving the nutritional status of low-income groups and others. Educational messages vary according to differences in lifestyle, culture and access to natural or processed foods. Nutrition communication compares favourably with other nutrition interventions with regard to cost-effectiveness. Maintaining nutrition communication programmes over a long period of time is essential to sustain meaningful behavioural changes.

81. Formal and in-service training for health professionals, teachers, agricultural extension workers and other community workers to become effective communicators is an essential component of the overall strategy to promote healthy diets and lifestyles. Health education in schools can have positive effects on entire households. Relevant school curricula and materials, teacher preparation, modification of the school environment and cooperation between schools, parents and the local health and social services are essential elements of nutrition education.

82. ***Preventing and managing infectious diseases.*** Prevention of infection and management of infectious diseases involves the reduction of their incidence, duration and severity. Priority areas of action include: health education, environmental health and food hygiene control, immunization, curative care, growth monitoring and promotion and primary health care.

83. Early and adequate curative treatment of infectious diseases can have an important effect on nutritional status. An outstandingly successful example is oral rehydration therapy for diarrhoea, which is now widely accepted and used. Adequate food intake during and after diarrhoeal episodes reduces the impact on nutritional status and hastens recovery. Curative services at home or in clinics for acute respiratory infections, diarrhoea, malaria and childhood and parasitic diseases help prevent malnutrition. The availability of essential drugs influences the utilization of health services and their success in shortening disease episodes and improving nutritional status.

84. Environmental health programmes that address safe water, human and town waste disposal and adequate housing have the potential to reduce significantly morbidity from various water- and faecal-borne infectious diseases. Food-borne diseases are widespread and need to be controlled since they are important causes of diarrhoea, as are many other infections resulting from bacteria, viruses, mycotoxins and parasites.

85. Immunization coverage has steadily risen in most developing countries over the last decade, and even greater coverage — above 70 percent — is expected in the 1990s. Children coming to health clinics could be weighed and immunized during the same visit, thereby reducing the risk of losing contact with the child.

86. Early detection of growth faltering in infants and children and the promotion of their growth are important for breaking the malnutrition-infection complex. Many countries are developing community-based growth monitoring and promotion programmes, often as a cooperative effort between the communities, government health services and NGOs.

87. The accessibility, acceptability and adequacy of health services strongly influence whether people will utilize and benefit from health services and whether they will alter their behaviour to improve their health. The extension of MCH services in particular to remote or underserved areas can do much to alleviate infection and malnutrition. PHC or community-based health care is the fundamental way of responding to the community's needs in this area and of ensuring community members' active participation in the planning and implementation of their own health care, in generating health awareness, in mobilizing the community and in successfully preventing infections through environmental changes and modification of harmful health practices.

88. Specific health programmes to prevent tropical infections and infestations through vaccinations and vector control can exert a positive influence on nutrition. In addition, precautions need to be taken to ensure that new or existing development activities do not create additional nutrition and health problems.

89. ***Caring for the socio-economically deprived and nutritionally vulnerable.*** Policies should be developed to improve care for nutritionally vulnerable individuals, such as infants, young children, mothers, the disabled and the elderly. They should strengthen the capacity of the family as a social and economic unit to provide care. Providing adequate care for these people, as well as for refugees and displaced persons, often requires strengthening capabilities and institutions at the community, national and international levels.

90. The first type of care required is that for the infant and it focuses on breast-feeding, which provides psychological, social and biological benefits. National programmes for breast-feeding protection and promotion need to be designed and implemented. Recognition of some negative influences in maternity services has led to programmes to develop baby-friendly hospital approaches and training programmes.

91. The weaning process begins with the gradual introduction of supplementary foods suitably prepared for the infant's digestive capacity in accordance with local food availability and cultural traditions. Frequent feeding with adequately energy-dense foods is important. The importance of continuing close care and nurturing by the mother or other care-giver, particularly during episodes of infection and throughout the second year of life in general, needs to be emphasized.

92. In many households women are the principal providers of care, and their capabilities largely depend on their personal health, education, time and energy, as well as on their control of household resources and ability to use them effectively. By providing access to health and related services, the physical and mental health of the mother is promoted. Dietary guidelines for mothers during pregnancy and lactation should be widely disseminated. Encouraging parents to space pregnancies over adequate time periods can benefit both mothers and children. Also, the benefits of breast-feeding in contributing to longer birth intervals can be stressed.

93. Improved maternal education and literacy can influence the skills and knowledge needed for successful child care practices as well as for parental decisions regarding expenditures of time and resources. A balance between time spent on providing adequate care for the family and time spent on work outside the home should be encouraged, including sharing of responsibilities for care and the burdens of work in general among household members. Improved literacy and education among fathers can enhance their contributions to the nutritional well-being of children as well.

94. The elderly are becoming a substantial proportion of the population in many countries and growing impoverishment among the elderly in some countries increases the risk of nutritional deficiencies. In general, traditional family care structures found in most societies are supportive of the elderly, but these are weakening. Special programmes to address the nutritional problems of the elderly, such as the provision of food commodities or prepared meals, may be needed. Strategies to care for the disabled should aim to prevent dependency, with a greater emphasis on job and skills training. The family and community organizations that help people to cope with their disabilities should be promoted.

95. Traditional support systems can be very effective through a reduction of workload, economic assistance and increased knowledge or emotional support. Community support through the formation of child care centres, work groups, cooperatives or informal networks for sharing tasks is critical.

96. At the national level appropriate technologies and better infrastructure to reduce the demands on women's time and efforts should be developed. Women's rights to property and income need to be strengthened through legislation and efforts should be made to provide social security for women wherever possible.

97. International strategies to provide care operate when refugees cross borders and international agencies are called upon to protect their welfare. Refugees and displaced persons need resources to help them cope with deprivation, meet their basic needs and become self-reliant.

98. **Assessing, analysing and monitoring nutrition situations.** Nutritional status is the outcome of a wide range of social and economic conditions and is a sensitive indicator of the overall level of development. Nutrition-related information is essential for selecting and implementing effective policies and programmes to improve nutritional well-being. To be useful, information must be provided to the appropriate decision-makers in a timely manner and in an easily understood format.

99. Information related to nutrition is needed for a variety of purposes, such as: identifying chronic nutritional problems and their causes; predicting and detecting short-term or acute nutritional problems; targeting population groups for both short-term relief efforts and longer-term policy and programme development; monitoring changes; and evaluating the impact of interventions and development programmes.

100. Efforts to assess and monitor nutritional status and other nutritionally relevant factors must be cost-effective, timely and directed toward specific goals such as preparation of development plans and budget decisions. Two simple but fundamental principles to consider when developing data collection, analysis and reporting mechanisms are: information is useful only if it is used; and the resources used for data gathering and analysis must be seen in relation to the even greater resources required for intervention.

101. Generally, the most practical approach to nutrition monitoring is to use a minimum number of indicators and to focus on those that lend themselves to regular assessment. The prevalence of underweight status in pre-school children is the most commonly used indicator of undernutrition. Some analysis based on criteria such as administrative areas, urban and rural areas, ecological zones and possibly selected socio-economic factors, such as income source, access to services and programmes, is useful.

102. In the case of food crises, timely commitment of resources for public works and food distribution is required. Often the most important early warning indicators are based on forecasts of food availability and price indicators. The experiences of several countries, including Botswana, India and Indonesia, show that food crises can be successfully resolved with the help of appropriate and timely information.

103. While assessing the food security status of specific households may be difficult, monitoring changes in food prices is relatively simple and can be a useful indicator in many national early warning systems.

104. Monitoring of infectious diseases can be conducted at the community level through the health system or the PHC service. Breast-feeding practices and infant feeding and weaning practices should also be assessed.

105. Following dietary patterns and disease trends may be useful for monitoring diet-related chronic diseases. Trends often assessed at the national level from Food Balance Sheet data relate to total energy intake and percentage of energy from fat and from fat of animal origin.

106. Information is also needed on the implementation and cost-effectiveness of programmes aimed at resolving particular nutritional problems or targeted at a particular group or geographic area. An appropriate institutional capacity is central to nutrition monitoring. Many countries are still at the stage of establishing nutrition information systems, generally starting with data on childhood undernutrition. Often, with the use of established data sources and information systems, a more multifaceted system can be developed in accordance with a country's priorities and resources.

107. Global-level assessments of food security include two types of objectives: to advocate the allocation of resources so that hunger and malnutrition are addressed; and to alert donors to impending food crises. These are based on various sources, two of which are FAO's Food Balance Sheet procedures and the Global Information and Early Warning System (GIEWS). International health monitoring projects involving a number of countries are under way through WHO. One project, the Global Cardiovascular Disease Monitoring and Prevention Network (GCMP Network), is being extended to include some developing countries. WHO has also established the Global Nutritional Anthropometry Data Bank and the Global Data Base for Nutritional Trend Analysis.

MEETING THE NUTRITION CHALLENGE

108. A clear perception of the nature and magnitude of nutritional problems and the factors and policies that influence them is a first step in formulating the strategies required to meet the nutrition challenge. It is also necessary to keep in mind the basic principles that are essential for the success of those policies aimed at improving nutritional well-being, as well as the contribution that governments, NGOs, local communities, the private sector and the international community, including international organizations, can make in this endeavour.

109. A set of principles can be identified for incorporating nutrition into national development. These include pursuing policies for sustainable economic and social development with emphasis on growth with equity; promoting local community participation; strengthening technical and managerial capacities at both the community and intermediate levels of government; focusing on human resource development and training; improving the status of women; fostering intersectoral action and partnership among agencies; incorporating nutritional objectives in sectoral policies and programmes; enhancing the role of consumers and consumer education; and ensuring commitment on the part of governments and the international community.

110. The aim should be to develop three main types of action:

- the incorporation of nutrition objectives and action into national, sectoral and integrated development plans, and the allocation of necessary human and financial resources so that these objectives may be achieved;
- the development of specific nutritional interventions directed at particular problems or groups;

- the generation of community-based actions for nutritional assessment of problems and the implementation of appropriate measures.

111. Various entities, public and private, need to have mutually supportive roles and responsibilities if the nutritional challenge is to be met. This is briefly discussed below.

112. Governments need to take a leading role in working toward solutions to nutrition problems. However, while taking direct responsibility for some strategies, governments should encourage and facilitate action by other institutions in other areas. The role of the government would mainly involve sectoral activities, especially in the fields of agriculture, health, education and social welfare. Ministries could prepare a review of the nutritional impact of their policies, programmes or projects. Intersectoral cooperation, especially between health and agriculture, is important in many areas, and there is considerable scope to increase it. Each country needs to evaluate its own experiences and processes of intersectoral cooperation and strengthen them as necessary in light of their needs and resources.

113. NGOs can play an important role in generating innovative action at the grassroots level. They should strive for full integration in the national system and address the issue of replication and generation of wider impact. Consumer organizations can initiate a dialogue with the food industry and distribution network agents.

114. Private enterprise has an important role to play in nutrition, especially since most food and agricultural production is carried out by small-scale private farmers. Small-scale rural and other industries are also important, particularly in ensuring good food processing, food quality and safety and nutritious products. The contribution of private industries to research in nutrition is also significant.

115. Legislation regarding the quality and safety of food and its labelling, marketing and advertising is a government responsibility, however, the implementation and monitoring of these measures are mainly in the hands of the private sector and consumers. Dialogue between all partners — namely, the government, consumers and private industry — is essential, and they must cooperate with each other if sustainable improvements are to be made.

116. The international community can provide support to national efforts through international organizations and bilateral agencies. Many UN agencies address nutrition problems directly or they have an impact on nutrition through their general activities. Among these agencies, FAO, UNICEF, WHO and the World Bank have nutrition divisions or subdivisions while many of the others have at least one full-time nutrition adviser. The concerned UN agencies participate in the Administrative Committee on Coordination's Sub-Committee on Nutrition (ACC/SCN). The aggregate financial and technical contributions of bilateral organizations is substantial and several of them have nutrition advisers, some of whom participate actively in the ACC/SCN.

117. International research support for nutrition is provided in the fields of both agriculture and health. The Consultative Group on International Agricultural Research (CGIAR) supports 18 international centres worldwide, all of which have made important contributions to agricultural research development, sometimes with significant nutritional implications. Although research support for nutrition is relatively less in the health sector, an active network of research institutions exists in all regions.

118. Success in meeting the nutrition challenge requires human resource development. At the national level, professionals who can guide national programme formulation, implementation, monitoring and evaluation are needed. Training should be problem- and action-oriented. There is a need to strengthen national training institutions in all countries. A crucial concern is the development of capacities for nutritional analysis and action at the district level where, generally, no nutrition personnel are present. Moreover, there is a need

to develop the capacities of community leaders to assess the nutritional situation and to design measures to improve it.

119. There is currently a precious opportunity — taking advantage of the present trend towards grassroots democracy — to develop community-based initiatives with adequate sectoral and intersectoral support from the district and higher levels. The challenge is formidable, but attainable, if there is a global commitment and concerted action on the part of local communities, governments, NGOs and the private sector. A fundamental need is to focus the attention of planners and policy-makers on nutritional status as one of the main indicators of development so that improvements in human welfare become primary objectives of the development process. National initiatives and commitment of resources to formulate and implement national policies and programmes are essential. The international community can make a critical contribution by cohesive action directed at national needs and priorities. In cooperation with governments, international organizations will need to play catalytic, advocacy and supportive roles in promoting national efforts to enable people to achieve nutritional well-being.

Chapter 1

Scope and dimension of nutrition problems

The magnitude and trends of nutrition problems

1. Hunger and malnutrition remain the most devastating problems facing the majority of the world's poor. In spite of general improvements in food supplies and health conditions and in the availability of educational and social services throughout the world, malnutrition in its various forms persists in virtually all countries. Although it is impossible to measure accurately the total number of malnourished individuals, the latest data indicate that about 20 percent of the developing world's population — over 780 million individuals — suffers from insufficient food intake and over 192 million children are suffering from protein-energy malnutrition (PEM). Many more people, approximately 2 000 million, are also affected by various micronutrient deficiencies. In addition, chronic diet-related non-communicable diseases, such as obesity, cardiovascular diseases and some cancers, are emerging public health problems in most countries.
2. Insufficient food intake is one of the most important causes of malnutrition, however, it is not the only cause. Infections, parasitic infestations and lifestyle factors often combine with inadequate or imbalanced food intakes to result in a variety of conditions leading to weight deficits or loss, growth failure, anaemia, learning disabilities, lowered activity levels and work capacity, increased susceptibility to other diseases, blindness and various chronic diseases. For affected individuals and households the consequences of such widespread malnutrition are grave. In addition to the human suffering, the loss in human potential translates into social and economic costs that no country can afford. These consequences and costs of poor nutrition are discussed later in this chapter.
3. Food and nutrition situations may be assessed by various indicators. These range from indicators of the availability of, access to and consumption of food, to indicators of nutritional status, such as body measurements, mortality rates and clinical and biochemical signs.

ESTIMATING THE NUMBER OF CHRONICALLY UNDERNOURISHED

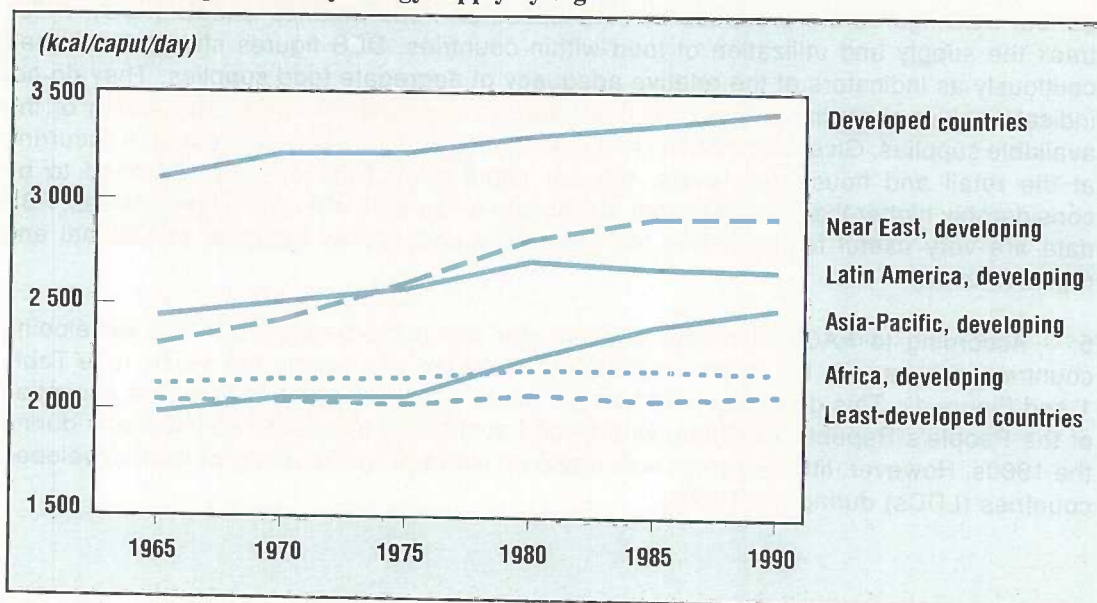
4. **Dietary energy supply (DES).** A widely used indicator of aggregate food and nutrition situations is dietary energy supply (DES). This is an estimate of the average daily per caput energy available for human consumption in the total food supply during a given period. DES figures are produced by FAO based on Food Balance Sheets (FBS), which track the supply and utilization of food within countries. DES figures should be utilized cautiously as indicators of the relative adequacy of aggregate food supplies. They do not indicate actual consumption, nor do they indicate the inequity in the distribution of the available supplies. Given the inequity in distribution and the losses and wastages occurring at the retail and household levels, the per caput availability of food will need to be considerably higher than the per caput physiological requirement level. Nevertheless, FBS data are very useful for indicating trends in food and energy supplies at national and regional levels.
5. According to FAO estimates, average per caput food supplies in the developing countries increased in the 1980s, although at a slower rate than in the 1970s (see Table 1 and Figure 1). This generally held true for the low-income countries with the exception of the People's Republic of China, where food availability increased considerably during the 1980s. However, little progress was made on average by the group of least developed countries (LDCs) during the 1980s.

6. The problem is particularly serious in sub-Saharan Africa, where severe food supply difficulties are faced continually. In 1992, an acute food crisis also struck southern and eastern Africa as the consequence of drought as well as of ongoing civil unrest in some countries, and this has further depressed food availability from an already unacceptably low level. The drought has led to a dramatic fall in food crop production, with acute food shortages in several areas. Currently, Somalia is experiencing a massive famine. Ethiopia, Kenya and the Sudan have also had a poor rainy season and a substantial relief effort is needed if further deterioration of the situation in the Horn of Africa is to be avoided. In addition, continued civil conflict in Somalia and southern Sudan has not only curtailed domestic food production, but it has also led to internal displacement and refugees and has hampered efforts to provide relief to those persons most affected. In eastern and southern Africa, the drought has also affected the livestock sector, upon which the livelihoods of a large proportion of the population of these subregions depend. As well, the southern region of Africa normally depends on food exports from Zimbabwe and the Republic of South Africa, but these countries themselves have required major food imports in the current year and consequently have been unable to supply bordering countries. Overall, 40 million people have been affected and are dependent on continued emergency assistance for their survival.

7. Even though food availability declined in several countries during the 1980s, by the end of the decade about 60 percent of the world's population was living in countries that had in excess of 2 600 calories (kcal) available per person per day. Grouping countries above or below a selected cut-off point, in this case 2 600 kcal, can be used to highlight the disparity of available food supplies among countries. By 1989/90, 41 developing countries (with populations of over 1 million) had in excess of 2 600 kcal available per person, while 15 countries had in excess of 3 000 kcal available. For developed countries, only three had less than 3 000 kcal available.

8. While malnutrition still exists in countries with adequate aggregate food supplies, an inadequate food supply clearly indicates there will be an even higher prevalence of nutritional problems. During the period 1988 to 1990, there were about 11 countries with per caput DES of less than 2 000 kcal per person. It is not possible for a population to meet its energy needs from such a limited supply. Hunger and malnutrition are inevitable among many of the 123 million people living in these countries where the food situation is so critical.

Figure 1. Change in dietary energy supply by region



Source: FAO.

TABLE 1. Per caput DES¹ by region or economic group

Region or economic group	1969-71	1979-81	1988-90
	(Kcal/person/day)		
World	2 430	2 580	2 700
Developed countries	3 190	3 290	2 700
North America	3 230	3 330	3 600
Europe	3 240	3 370	3 450
Oceania	3 290	3 160	3 330
Former USSR	3 320	3 370	3 380
Developing countries²	2 120	2 330	2 470
Africa	2 140	2 180	2 200
Asia and the Pacific	2 040	2 250	2 450
Latin America and the Caribbean	2 500	2 690	2 690
Near East	2 420	2 810	2 920
Least-developed countries	2 030	2 060	2 070

Source: FAO.

¹ Dietary Energy Supply.

² Includes the least-developed countries.

9. Aggregate estimates of food availability at either global, regional or country level cannot reflect household or individual food consumption. At the household level this depends on the ability of households to produce or procure food, and it is a function of income levels and distribution, food availability and wastage, prices and consumer choices. At the individual level, preferences and care and feeding practices are also important determinants of dietary intakes.

10. **Chronic dietary energy deficiency.** Given the limitations of using aggregate supply figures to assess nutritional well-being, FAO has developed a methodology that estimates the number of people, as well as the proportion of the population, that over a period of a year do not have access to enough food to meet their energy needs. This proportion of the population may be referred to as being chronically undernourished. However, as this figure does not take into account problems of intrahousehold food distribution, those persons facing seasonal or acute problems of malnutrition or those having infections, the actual number of undernourished people is likely to be higher. This methodology was developed in connection with FAO's World Food Surveys and is based on estimates of the distribution of available food supplies among households and the application of a cut-off point relating to energy requirements.

11. By 1988-90 there was enough food in the world, if distributed according to individual requirements, to provide well over what would have been needed to meet energy needs. However, during that period it is estimated by FAO that over 780 million people in developing countries regularly failed to have access to enough food to meet their dietary energy needs for an active, healthy life. Even though this represents a considerable improvement over previous periods, it is still an unacceptably high figure (see Table 2).

12. For the developing regions as a whole there has been a consistent decline in the past 20 years in the proportion and the absolute number of people chronically undernourished. In 1969-71 approximately 941 million people were chronically undernourished, compared

TABLE 2. Estimate of chronic undernutrition¹ in developing regions for 1969-71, 1979-81 and 1988-90

Region	Period	Total population (millions)	Proportion (percent)	Undernourished (millions)
Africa	1969-71	288	35	101
	1979-81	384	33	128
	1988-90	505	33	168
Asia and the Pacific	1969-71	1 880	40	751
	1979-81	2 311	28	645
	1988-90	2 731	19	528
Latin America and the Caribbean	1969-71	281	19	54
	1979-81	357	13	47
	1988-90	433	13	59
Near East	1969-71	160	22	35
	1979-81	210	12	24
	1988-90	269	12	31
All developing regions	1969-71	2 609	36	941
	1979-81	3 262	26	844
	1988-90	3 938	20	786

Source: FAO.

¹Defined as "chronic dietary energy deficiency".

with 786 million in 1988-90. This represents a drop in the proportion of the population chronically undernourished from 36 to 20 percent in these countries.

13. However, this global improvement has not been evenly matched in each of the developing regions. In Africa the proportion of the population chronically undernourished has remained practically unchanged since the 1970s, but because of the region's annual population growth rate of approximately 3 percent the number of people affected has increased dramatically, rising from 101 million people in 1969-71, to 128 million in 1979-81, and then to 168 million in 1988-90.

14. The rate of improvement slowed down both in Latin America and the Caribbean and in the Near East during the 1980s. Though the proportion was already quite low (12 to 13 percent), population growth in both regions actually increased the number of persons estimated to be chronically undernourished. In the Asian and Pacific region, however, there has been continued improvement over the last 20 years, with the proportion of the population affected declining in that period from 40 to 19 percent.

15. While Africa is the region with the highest proportion of its population affected (33 percent), by far the greatest number of chronically undernourished — 528 million — live in the Asian and Pacific region, most notably in South Asia (see Figure 2).

PROTEIN-ENERGY MALNUTRITION

16. The term protein-energy malnutrition (PEM) has been used to describe a range of disorders primarily characterized by growth failure or retardation in children. Other terms have been used as well, including failure to thrive and infant multideficiency syndromes. Extreme clinical forms of PEM are called marasmus and kwashiorkor. The immediate causes of PEM, which frequently occur together, include inadequate dietary intake and infectious diseases. Infants and young children are the most severely affected by PEM

because of their high energy and protein needs relative to body weight and their particular vulnerability to infection.

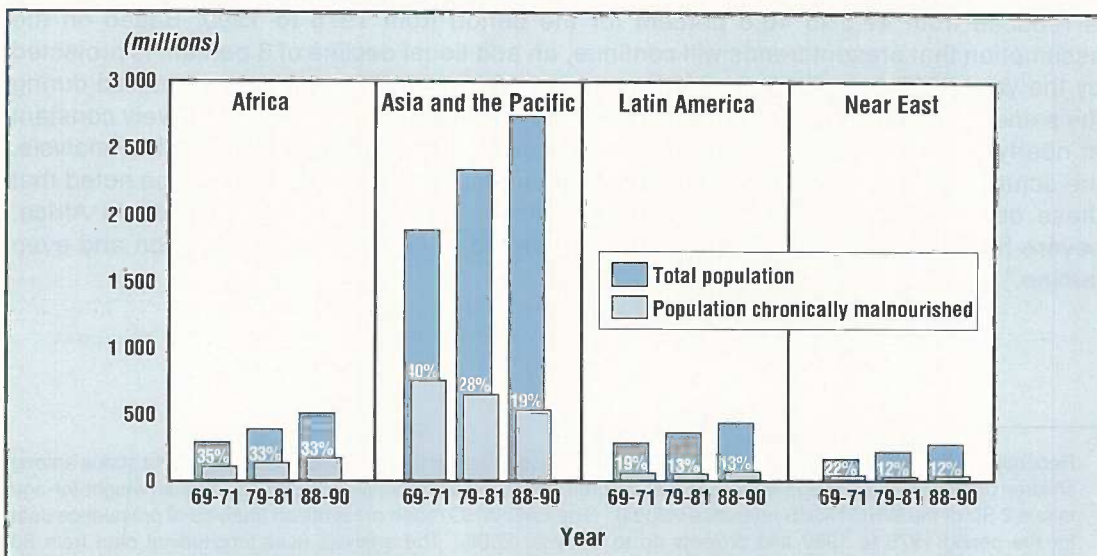
17. Anthropometric measurements used to estimate body mass and growth failure, often in association with age, permit the development of certain indexes reflecting individual or population characteristics. "Wasted" (or thin), "stunted" (or short) and "obese" are terms that describe the nutritional status of individuals and they are quantitatively expressed in various anthropometric indexes.

18. Global and national estimates of the prevalence of wasting and stunting should be interpreted with care since they do not provide an adequate basis for assessment and appropriate action at the local level. Such averages do not reveal the differences between geographical areas or socio-economic groups with regard to the nutrition situation. Furthermore, they do not identify the factors that are responsible for PEM and the actions needed to resolve the problem. Nevertheless, aggregated data can indicate broad trends that can serve as a useful basis for planning appropriate actions and for evaluating the impact of broad national programmes.

19. Many indications of deteriorating nutritional status are documented during the "hungry season" and other periods of shortage: pregnant women lose weight and deliver low-birth-weight babies, child morbidity and mortality reach their peak, workers are less productive and other signs of poor health become evident. In tropical climates the highest incidence of infectious diseases is frequently during the rainy season, which is typically the period before the new harvests are gathered.

20. Often the most obvious and dramatic manifestations of PEM are the result of emergency situations. Many of these situations may be termed natural disasters, such as droughts, floods and outbreaks of agricultural pests. Yet, in many instances, human activity is partially responsible for the causes and consequences of the hazards. Tragically, the most serious nutritional problems are often those arising from wars and civil disturbances. Preventing famine and mitigating the immediate and long-term effects of food emergencies are among the paramount nutrition challenges facing the world community today.

Figure 2. Estimate of chronically undernourished¹ in developing regions (number and percentage of total population)



Source: FAO.

¹ Defined as those people whose estimated average daily energy intake over a year falls below that required to maintain body weight and support light activity.

USING "FOOD BALANCE SHEET DATA" TO ASSESS NUTRITION SITUATIONS

Precise assessments of national nutritional levels are difficult to make. National surveys of nutritional status and actual levels of food consumption are perhaps the most accurate sources of information, but they are costly, time-consuming and often impractical, especially for low-income countries. An alternative, and frequently more feasible, approach is that based on FAO's Food Balance Sheets (FBSs), which examine each nation's food situation. FBSs provide information about a country's average per caput dietary energy supply (DES), which indicates the amount of food available for human consumption in the country, among other data.

DES is an imperfect tool and it may be misleading since it does not provide a direct assessment of food consumption. For instance, people may be too poor to buy the food that is available. Attempts to assess food adequacy by comparing DES with requirement figures sometimes fail for these reasons. Furthermore, the question of which requirement figure to use is not always obvious. Should the requirement figure be that for mere survival or should it refer to a particular level of activity?

Despite such limitations, when combined with information about the distribution of food supplies, it is possible to estimate the number of people whose energy intakes are too low. DES also correlates closely with other indicators of health and socio-economic development.

Recently, in connection with the FAO World Food Surveys, there have been refinements in the concepts used to estimate the number of people in developing countries who do not have access to enough food to meet their energy needs on average during a year. While actually classified as being chronically dietary-energy deficient, this is commonly taken to reflect the proportion of the population chronically undernourished. The modifications incorporate concerns of inequitable distribution and variations among households in relation to estimates of energy needs.

Additional conceptual modifications to the methodology have occurred since the Fifth World Food Survey in 1986. These include modifications to the previous cut-off points (1.2 and 1.4 BMR) used to define energy needs. Basal Metabolism Rate (BMR) refers to the energy expenditure of an individual while in the fasting state and lying at complete rest. A higher, more realistic energy level (1.54 BMR), which represents energy required to maintain body weight and to support light activity, has now been adopted. Increasing the energy requirement level used consequently increased the estimated absolute number of persons affected by dietary-energy deficiency. Moreover, the addition of the People's Republic of China and a few other Asian countries previously excluded due to a lack of information, leads to higher global estimates of the number of people affected by dietary-energy deficiency.

21. **Child anthropometry.** According to recent analyses, there has been a decline in the prevalence of underweight status among children. When figures for Africa, Asia, the Near East and the Americas are combined, the percentage of children classified as underweight is reduced from 47.5 to 40.8 percent for the period from 1975 to 1990. Based on the assumption that present trends will continue, an additional decline of 3 percent is projected by the year 2005 (see Table 3). However, since a large number of births occurred during the same period, the absolute number of underweight children remained relatively constant at nearly 192 million. Since data from every country were not available for this analysis, the actual number of underweight children was undoubtedly higher. It should be noted that these data reflect the situation in "normal" times. In some areas, especially in Africa, severe human-caused or natural disasters have led to extensive undernutrition and even famine.¹

¹ Recently, FAO/WHO, ACC/SCN and UNICEF have analysed data on the prevalence of underweight status among children under five years of age worldwide (i.e. children whose measurements are below the median weight-for-age minus 2 SD of the WHO/NCHS reference values). The FAO/WHO report presents an analysis of prevalence data for the period 1975 to 1990 and projects up to the year 2005. The analysis uses longitudinal data from 60 countries, representing all regions of the world except the former USSR, for which adequate data were not available. Adequate country-by-country data and other indicators (based on weight-for-height and height-for-age) are currently being processed and will be available by 1993. In the meantime, projections are available for each country. The comments above are based on a FAO/WHO report (May 1992), however, it should be noted that there are differences in the data presented by other institutions.

TABLE 3. Prevalence and number of underweight¹ children under five years of age by region

Region	Percentage underweight			Number underweight		
	1975	1990	2005	1975	1990	2005
	<i>(in millions)²</i>					
Continental Africa	26	24	22	19.7	27.4	36.5
North Africa	20	13	11	3.1	3.0	2.7
East Africa	25	24	22	5.7	8.7	12.4
Middle Africa	24	22	19	1.8	2.7	3.6
Southern Africa	16	13	10	0.7	0.7	0.7
West Africa	35	32	29	8.3	12.2	17.0
Sub-Saharan Africa ³	28	26	24	17.4	25.4	34.9
Americas	12	9	8	7.8	6.8	6.2
North America	4	2	1	0.7	0.3	0.2
Caribbean	18	15	14	0.6	0.5	0.5
Central America	14	12	8	2.0	1.6	1.5
South America	15	11	10	4.4	4.3	3.9
Asia⁴	49	44	41	163.1	154.7	149.3
Eastern Asia	33	21	17	47.4	25.4	18.5
Southeastern Asia ⁵	48	38	32	24.6	21.6	18.4
Southern Asia	68	62	57	91.0	107.6	112.3
Near East⁶ (Western Asia)	22	15	12	2.9	2.9	3.1
Average percentage/Total numbers	47.5	40.8	37.8	193.6	191.9	195.2

Source: FAO/WHO, 1992.

¹ Underweight is defined as weight-for-age less than minus 2 SD of the WHO reference.

² Population projections for 1990 and 2005 are based on the medium variant from the UN.

³ East, middle, southern and western Africa, and including the Sudan from North Africa.

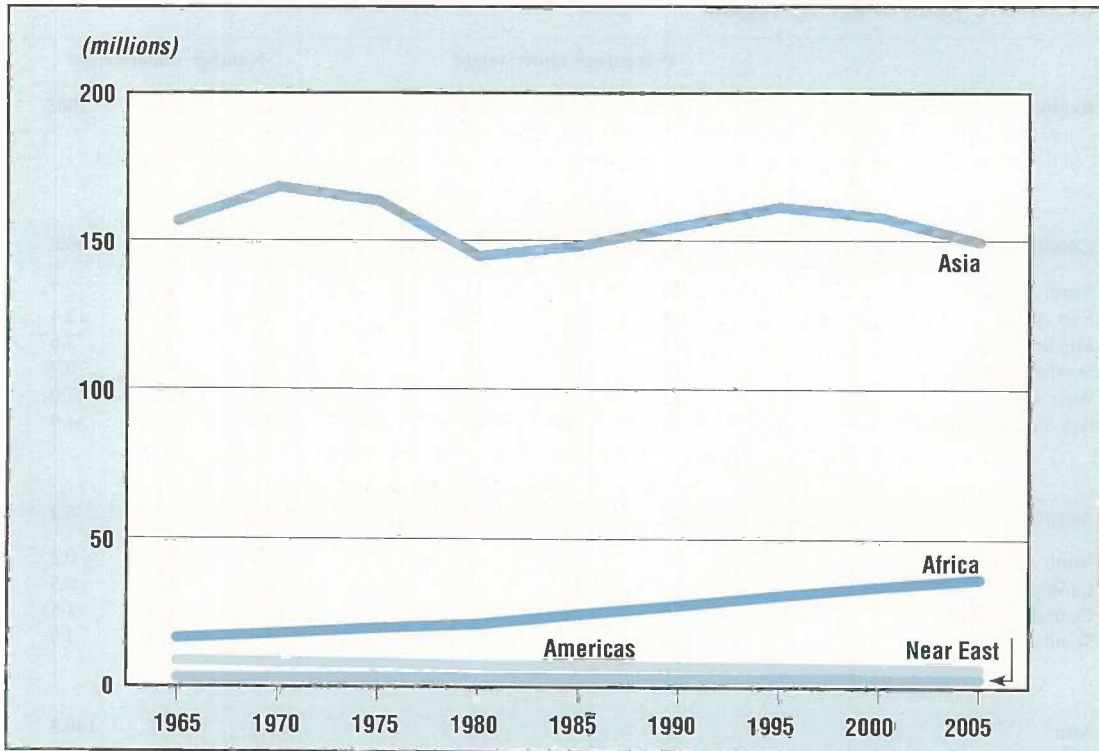
⁴ Excluding the countries of the former USSR, and the Near East (or western Asia), which is tabulated separately.

⁵ Including Papua New Guinea and Vanuatu.

⁶ Excluding Gaza Strip and Cyprus.

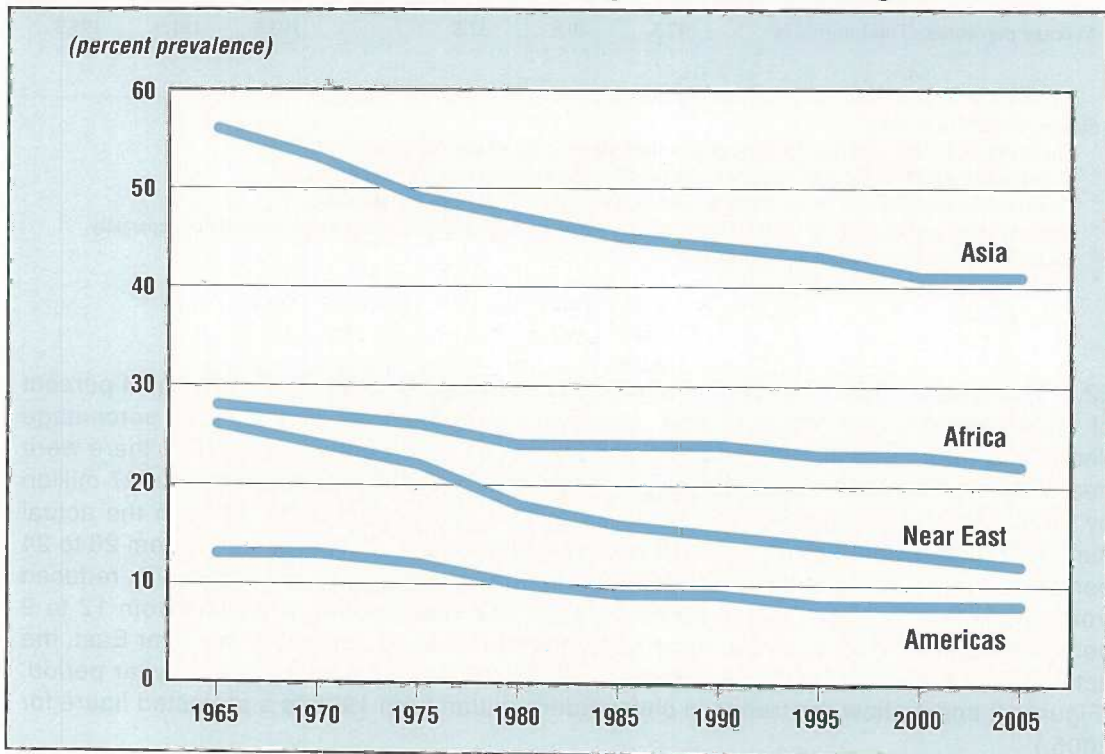
22. There were 155 million underweight children in Asia in 1990, representing 44 percent of children under five years of age. However, both the total number and percentage decreased from 1975 to 1990 and this trend is expected to continue. In Africa, there were nearly 20 million underweight children in 1975. This number grew to more than 27 million by 1990 and is expected to increase to 36 million by the year 2005. Though the actual number of underweight children is increasing, a slight decline in percentage, from 26 to 24 percent, has occurred. In the Americas, the number of underweight children was reduced from nearly 8 million in 1975 to 6.8 million by 1990, representing a decline from 12 to 9 percent. In spite of the decrease in percentage from 22 to 15 percent in the Near East, the actual number of underweight children remained at 2.9 million during this 15-year period. (Figures 3 and 4 show the trends in child undernutrition from 1965 to a projected figure for 2005.)

Figure 3. Trends in numbers of underweight children for each region



Source: FAO/WHO.

Figure 4. Trends in percent prevalence of underweight children for each region



Source: FAO/WHO.

ANTHROPOMETRY AS AN INDICATOR OF NUTRITIONAL STATUS

Anthropometric indexes provide an approximate reflection of nutritional status. The indicators used most often are body weight and height, in relation to a subject's age and sex. Others include arm, head and thigh circumferences and skin-fold thicknesses. The main anthropometric indexes used are: weight-for-height, height-for-age, weight-for-age and Body Mass Index (BMI). $BMI = W/H^2$, that is, weight in kilograms divided by the square of height in metres. WHO uses the United States' National Centre for Health Statistics (NCHS) data as a standard since many studies have shown that the growth of normal, healthy and adequately nourished children almost always approximates these reference values. Preferably, anthropometric data for children are quoted in terms of "Z-scores", based on standard deviations (SDs) above or below the median reference value for a person of a given age. The level of median minus 2 SD is usually taken as the cut-off point or threshold, below which the status is considered unsatisfactory, that is, undernutrition exists.

Weight-for-height

This index is used for both adults and children in relation to accepted reference values. In acutely undernourished people (those who have had inadequate dietary intakes or an acute infection within recent weeks), decline in body weight is relatively rapid and height remains unchanged in adults and changes very slowly in children. Weight-for-height is a measure of "acute undernutrition" or "wasting" and is the index most used in nutritional emergencies as well as in long-term situations of undernutrition, such as famine. Weight-for-height is useful in assessing the nutritional status of children and adults. In children, weight-for-height ratios can be used without knowing the individual's age. In most circumstances, less than 2 percent of children under five years of age are below the median minus 2 SD. If 5 to 10 percent of the population group is below this level, the degree of acute undernutrition may be described as moderate; if the proportion is beyond 10 percent, this is generally considered to be a severe situation.

Height-for-age

This parameter is used for assessing "chronic undernutrition" in children. Prolonged undernutrition causes retardation of growth in both height and weight to a roughly comparable degree. Impaired height gain is called "stunting". Height gain is most affected by long-standing environmental and socio-economic factors, hence, it reflects general socio-economic conditions. In developing countries, widespread chronic undernutrition is common and the proportion of individuals below the median minus 2 SD is often in the range of 20 to 60 percent, with an average near 40 percent. Populations in which 25 to 50 percent of the children under five years of age have height-for-age below the median minus 2 SD are commonly considered to be moderately affected, while those with more than 50 percent are considered to be severely affected.

Weight-for-age

The proportion of children under five years of age who are below the median minus 2 SD (weight-for-age) ranges from 10 to 50 percent, with an average of around 20 to 30 percent in many developing countries. Populations with 20 to 40 percent of children who are underweight for age can be considered moderately affected, and those with more than 40 percent are severely affected. The weight-for-age indicator is available more often than weight-for-height or height-for-age, but it is more difficult to interpret because it can be affected by either acute or chronic undernutrition. Serial weighings indicate incremental changes in weight, giving a more dynamic picture of growth velocity and the nutrition situation. This is, in fact, a much better way of assessing nutrition although it is more difficult to carry out.

Body Mass Index (BMI)

This index, defined as $\text{weight}/\text{height}^2$, provides a measure of body mass, ranging from thin to obese. It relates body weight to surface area of the body rather than to height. Empirically, it has been found that the normal range of BMI is from 18.5 to 25.0. Individuals with a BMI above 30.0 are considered obese, and those with a BMI below 18.5 are considered underweight. Some studies have shown increased mortality rates in both underweight and overweight subjects. WHO and FAO are currently studying this parameter with a view to deriving thresholds that would allow a more scientific interpretation of this index. This parameter is apparently also applicable to children, however, cut-off points have not yet been established.

Source: WHO Working Group on the Use and Interpretation of Anthropometric Indicators of Nutritional Status, 1986. *Bulletin of the World Health Organization*, 64: 929-941.

23. Within regions, analysis shows considerable variations in prevalence. In most regions of Africa, there were decreases in the percentages of underweight children ranging from 1 to 3 percent, with the exception of North Africa, where the decrease was more substantial. In Asia, significant declines in prevalence, ranging from 8 to 12 percent, occurred in all subregions. In the Near East the prevalence declined by 7 percent, while in the Americas there were declines ranging from 2 to 4 percent.

24. This trend toward a general improvement in the nutritional status of children is supported by an analysis of national data. WHO has carried out an analysis of national nutrition data from 19 countries, chosen on the basis of at least two national surveys and separated by four or more years. The percentage of underweight and stunted children dropped in all countries by an average of 3 percent of the initial prevalence level every year. The prevalence of stunted children also declined, but with a median of 2 percent of initial prevalence levels each year. More rapid rates of decline were associated with the following trends: faster rates of decline of infant and child mortalities; higher percentages of households with access to urban sanitation; higher literacy levels in males and females; more available calories and proteins per caput in the first survey; and higher levels of vaccination coverage. Increasing rates of population growth and population density were associated with increasing rates of stunting.

25. **Infant and child mortalities.** Among infants and young children, poor nutritional status and infection, as well as other environmental and socio-economic factors, can lead to death. Infant mortality rates are strongly influenced by nutritional factors such as foetal undernutrition stemming from maternal undernutrition or infections, toxæmia during pregnancy and maternal anaemia. There is increasing evidence that the mother's nutritional status has a pervasive influence on infant nutrition and survival. The infant mortality rates in developed and developing countries are summarized in Figure 5.

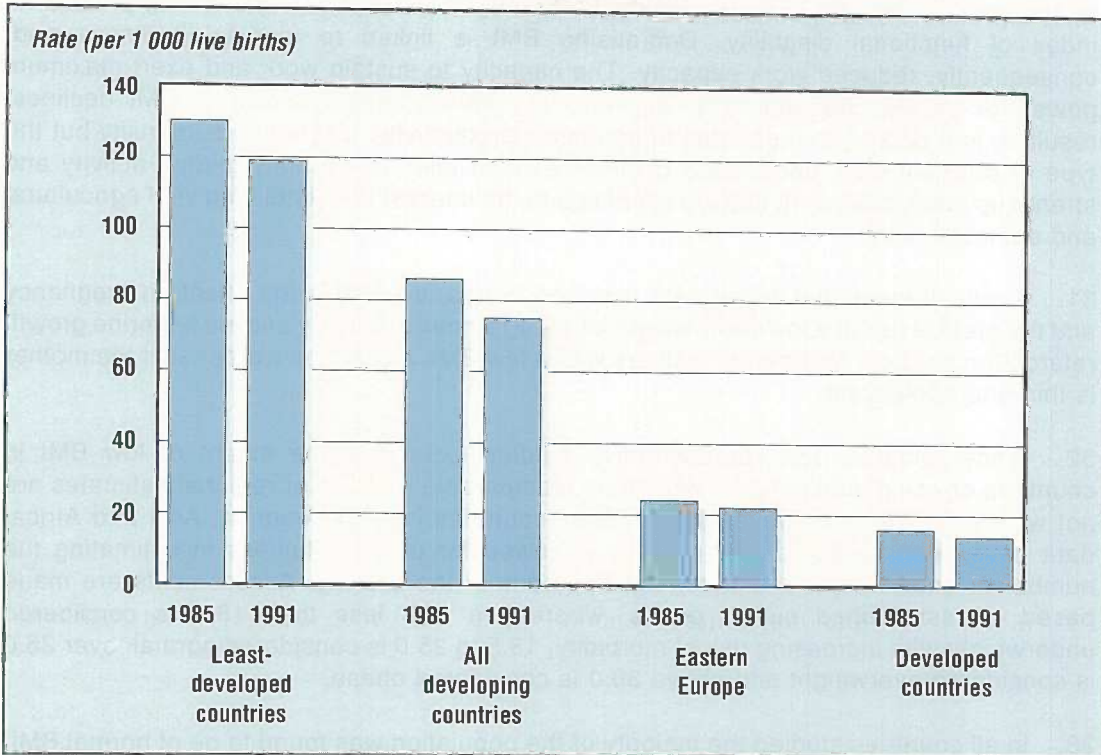
26. In developing countries the weaning process usually takes place between six months and two years of age. The period of highest vulnerability is in the second year of life (12 to 23 months), during which time the child is exposed to many new infections, receives less maternal milk and is most at risk of poor nutrition and death. Specific mortality data for this age group are often difficult to obtain because precise information regarding the number of children in this subpopulation is unknown and deaths may not be reported. The same difficulty often applies to the age-specific death rate for children one to four years old, which is an indirect but very useful indicator of the nutritional status of young children.

27. Under-five child mortality rates (U5MR) are often more available than those for children 12 to 23 months old or one to four years of age, and they are currently used as indicators by WHO, UNDP and UNICEF. In countries where the prevalence of infectious and parasitic diseases is high, about half of all deaths occur before five years of age and one-third of these deaths occur after the first year of life. In the least-developed countries nearly 200 out of every 1 000 infants born alive die before reaching the age of five, compared with less than 20 deaths per 1 000 live births in developed countries. The U5MR for developing countries is about 120 per 1 000 live births (see Figure 6).

28. UN Population Division data show a general improvement in infant and young child mortality. In sub-Saharan Africa, the infant mortality rate fell from 165 to 121 per 1 000 live births between 1960 and 1983. In South Asia the fall was from 157 to 115 infant deaths per 1 000 live births. In other regions the rates are well under 100 per 1 000 live births.

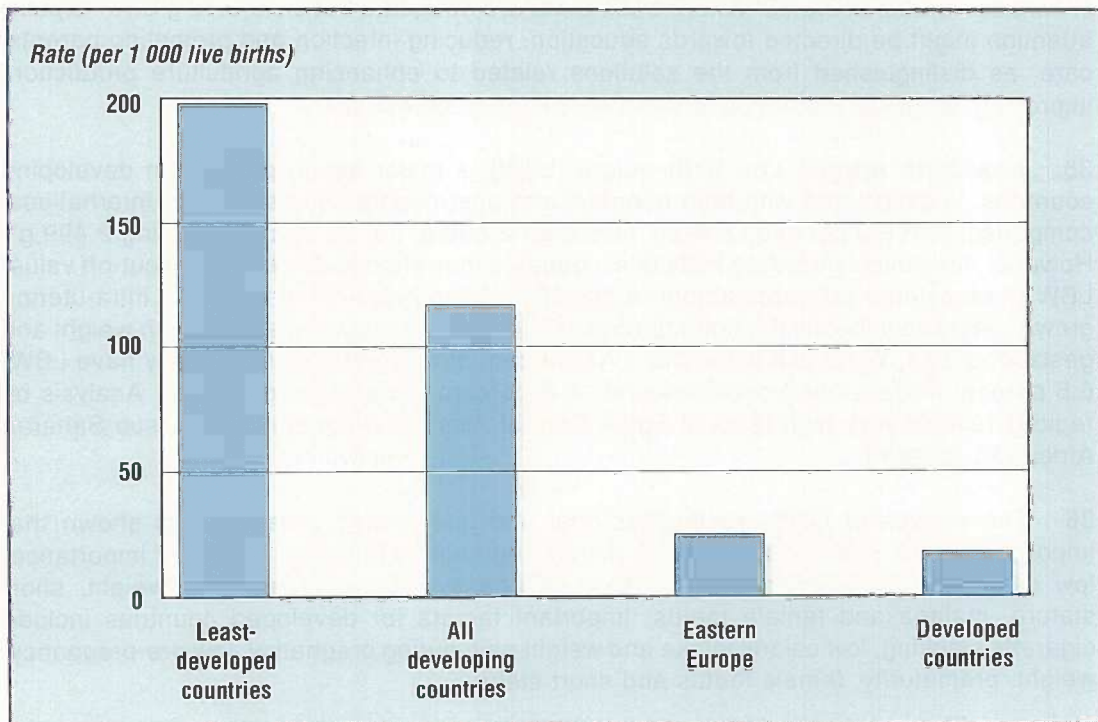
29. **Body Mass Index (BMI).** Body weight and height measurements compared to various reference standards have been used routinely to assess degree of overweight or obesity in adults, as well as undernutrition in infants and children. Recently, however, attention has been given to using adult weight and height measurements as indicators of undernutrition as well. Evidence is emerging for the appropriateness of using a combination of both adult and child anthropometry to assess undernutrition within a population.

Figure 5. Infant mortality rate



Source: WHO.

Figure 6. Under-five mortality rate (probability of dying before age five), 1991



Source: WHO.

30. Survey data indicate that an adult's BMI (that is, the body weight in kilograms divided by the square of height in metres) is closely related to life expectancy and may provide an index of functional disability. Decreasing BMI is linked to increasing illness and, consequently, reduced work capacity. The capacity to sustain work and exert maximum power for agricultural and other activities is reduced progressively as BMI declines, resulting in a decline in measures of economic productivity. Not only the intensity but the type of physical work undertaken declines as BMI falls. Community-related activity and strenuous productive work may be sacrificed in the interest of maintaining vital agricultural and domestic work.

31. A critical functional impairment resulting from a low BMI is the effect on pregnancy and the greater risk of a low-birth-weight infant. Premature delivery and intra-uterine growth retardation are both features of mothers with a low BMI, a situation worsened if the mother is thin and adolescent.

32. Since relatively few representative studies examining the extent of low BMI in countries or communities have been done, comparable national or regional estimates are not widely available. However, within some countries in Latin America, Asia and Africa, data have been collected and recently reviewed for their usefulness in estimating the number of underweight and overweight persons in the country. Assessments are made based on established cut-off points, whereby a BMI less than 18.5 is considered underweight with increasing risk of morbidity, 18.5 to 25.0 is considered normal, over 25.0 is considered overweight and above 30.0 is considered obese.

33. In all countries studied the majority of the population was found to be of normal BMI, except in India, where the majority was considered to be underweight (less than 18.5). In five of the six countries examined in Latin America the prevalence of overweight people ranged from 22 to 45 percent, while less than 10 percent were considered underweight. Haiti was the exception for Latin America, where over one-quarter of the population studied was underweight. Work is continuing to examine the validity and appropriateness of using adult BMI as a measure of overall food adequacy within communities.

34. A picture is emerging of the usefulness of combining a measure of adult BMI with children's nutritional status. Where adult BMIs are adequate but children's growth is poor, attention might be directed towards education, reducing infection and promoting parental care, as distinguished from the solutions related to enhancing agriculture production, improving household food availability and ensuring food security.

35. **Low birth weight.** Low birth weight (LBW), a major health problem in developing countries, is associated with both neonatal and post-neonatal mortality. For international comparisons, WHO defines LBW as "less than 2 500 g, i.e. up to and including 2 499 g". However, for clinical purposes individual countries may choose an alternative cut-off value. LBW is associated with prematurity (a gestational age below 37 weeks) and intra-uterine growth retardation below the tenth percentile of the reference standard for birth weight and gestational age. WHO estimates that 17.4 percent of newborn babies globally have LBW; 6.5 percent in developed countries and 18.8 percent in developing nations. Analysis by regions reveals very high rates in South Central Asia (33.5 percent) and in sub-Saharan Africa (15 percent).

36. The causes of LBW are multifactorial and interrelated. Analysis has shown that important factors related to LBW for a developing country include, in order of importance, low caloric intake or weight gain during pregnancy, low pre-pregnancy weight, short stature, malaria and female foetus. Important factors for developed countries include cigarette smoking, low caloric intake and weight gain during pregnancy, low pre-pregnancy weight, prematurity, female foetus and short stature.

TABLE 4. Population at risk of and affected by micronutrient malnutrition

Region ¹	Iodine deficiency disorders		Vitamin A deficiency		Iron-deficient or anaemic
	At risk	Affected (goitre)	At risk ²	Affected ² (xerophthalmia)	
	<i>(millions)</i>		<i>(millions)</i>		<i>(millions)</i>
Africa	150	39	18	1.3	206
Americas	55	30	2	0.1	94
Southeast Asia	280	100	138	10.0	616
Europe	82	14	-	-	27
Eastern Mediterranean	33	12	13	1.0	149
Western Pacific ³	405	30	19	1.4	1 058
Total	1 005	225	190	13.8	2 150

Source: WHO, 1992.

¹ WHO regions.

² Pre-school children only.

³ Including China.

MICRONUTRIENT DEFICIENCIES

37. The micronutrient deficiencies of public health significance are iodine deficiency disorders, vitamin A deficiency and iron deficiency anaemia. The distribution of micronutrient deficiencies in each region is illustrated in Table 4.

38. **Iodine deficiency disorders (IDD).** Over 1 000 million people live in areas where soils lack sufficient iodine. Two hundred million people have goitres, while 26 million — of which six million are cretins — suffer from mental defects caused by iodine deficiency. While there are people affected by iodine deficiency in 95 countries, over half of these individuals live in China and India. Iodine deficiency leads not only to goitres but it also impairs physical and mental development. It is the most common cause of preventable mental retardation. In severe cases, this deficiency leads to deaf-mutism, cretinism and other serious defects. Lack of this micronutrient can impair children's resistance to infection, leading to increased mortality. It can also impair reproductive functions, leading to increased rates of abortion, stillbirth and congenital anomaly.

39. **Vitamin A deficiency (VAD).** There are at least 190 million children living in areas where the consumption of foods containing vitamin A is low. Of these children, 40 million are deficient in vitamin A (as shown biochemically) and 13 million have some clinical eye signs of deficiency. Every year, a quarter to half a million children become blind, partially or totally, from VAD, and two-thirds of these children die within a few months of going blind. But apart from these victims, many more children — ten to 20 times more — are at risk because VAD impairs resistance to infection. These children live in 37 countries, half of which are in Africa. The great majority of the children at risk of VAD live in South and Southeast Asia. VAD causes night blindness and eventually blinding xerophthalmia. It also contributes to decreased physical growth and impaired resistance to infections with consequent increased mortality in young children.

40. **Iron deficiency.** Iron deficiency affects over 2 000 million people living in practically all countries. The people most affected by iron deficiency are women and children of pre-school age – often more than 50 percent are anaemic. Older children and men are also affected by lack of iron. The populations most affected are in Africa and South Asia. Anaemia in infants and children is associated with retarded physical growth and development of cognitive abilities and low resistance to infections. In adults, iron deficiency causes fatigue and lowers work capacity. It also causes grave impairment of reproductive functions. Maternal anaemia predisposes women to haemorrhaging and infections prior to, during or after childbirth, and as many as 20 percent of maternal deaths are caused principally by iron deficiency. Maternal anaemia also leads to intra-uterine growth retardation, low birth weight and increased rates of perinatal mortality.

41. **Other micronutrient deficiencies.** Several other micronutrient deficiencies, primarily beriberi, pellagra, scurvy and rickets, occur under special circumstances, generally because the quantity of the micronutrient is inadequate in the diet.

42. Vitamin B1 deficiency may be acute or chronic and it affects adults as well as infants. This deficiency is found among people whose main food is highly polished rice. In adults, it is sometimes associated with alcoholism. Lack of this nutrient causes beriberi. Beriberi occurs particularly in Asia and among refugee populations and prisoners. Beriberi has both cardiac and neurological manifestations.

43. Niacin or tryptophan deficiency can cause pellagra. This is classically characterized by diarrhoea, dermatitis and dementia. This deficiency occurs among people who are almost wholly dependent on maize or sorghum, and it is still occasionally seen among populations in remote areas of Asia or Africa and among refugees.

44. Vitamin C (ascorbic acid) deficiency, which causes scurvy, may affect adults, children or infants. It occurs especially among refugees, displaced persons dependent upon food rations and others who lack access to fresh fruit or vegetables, often as a result of severe drought. The manifestations of vitamin C deficiency include bleeding gums, internal haemorrhaging, especially subperiosteal, and anaemia.

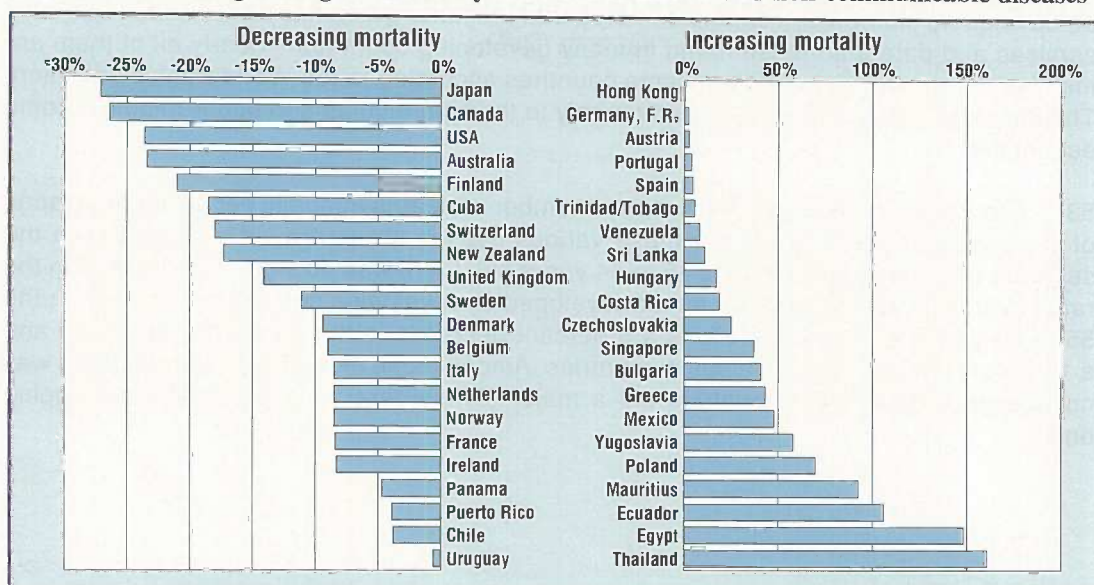
45. Rickets is still a problem in some communities where there is little vitamin D in the diet and inadequate exposure to sunlight, chiefly in infancy. Rickets occurs mainly in northern Africa, the Near East and southern and East Asia.

46. Fluoride, necessary for the proper development of tooth structure and resistance to caries, is insufficient in the soil and water in areas of most countries. Low fluoride levels in drinking-water increase the risk of developing dental caries. In other areas, excessive intakes of fluoride can occur, leading to dental mottling and skeletal deformities.

47. Zinc and selenium are two essential trace elements whose deficiencies are known to present substantial public health problems in large population groups. Zinc deficiency exacerbates growth retardation and diarrhoea in malnourished populations and impairs the immune system. Selenium deficiency is associated with Keshan disease — a cardiomyopathy mainly affecting children and women — and Kashin-Beck disease — an endemic osteoarthropathy affecting children, mainly in China and former Soviet Central Asia. Deficiencies of molybdenum, copper and chromium have been described, but their public health importance is not well defined.

DIET-RELATED NON-COMMUNICABLE DISEASES

48. As a result of broad socio-economic changes including rapid urbanization and the evolution of health services in both developed and developing countries, there has been considerable transition in health and nutrition in recent decades, leading to major changes in patterns of disease. Previously it was believed that problems of chronic non-

Figure 7. Percentage change in mortality rates due to diet-related non-communicable diseases¹

Source: WHO.

¹ In subjects 65 years and over, between 1960-64 and 1985-89 in 42 countries.

communicable diseases were minor or even non-existent in developing countries. However, in recent decades it has become evident that some segments of society in developing countries, as well as socio-economically deprived groups in developed countries, are increasingly affected by these problems.

49. Over the past 40 years there has been increasing recognition, especially in the industrialized countries, that certain chronic non-communicable diseases are closely related to diet and other aspects of lifestyle, notably emotional stress, reduced physical exercise and tobacco-smoking. The role of diet was found to have particular importance in the following disorders: obesity, cardiovascular disease, hypertension and stroke, diabetes mellitus (type 2: non-insulin-dependent), dental caries, various forms of cancer and other gastro-intestinal and liver diseases. Collectively, these illnesses are responsible for more than 70 percent of deaths in developed countries.

50. It was recognized decades ago that increases in these disorders are associated with excessive intakes of energy, especially in the form of fats, notably saturated fats, and to some extent alcohol and salt. In some countries, this awareness led to the implementation of educational efforts to encourage people to reduce their consumption of these dietary components and to avoid the types of behaviour that aggravate the incidence or risk of these disorders. This in turn led to a decline in the incidence of some of these disorders in some of the developed countries. Consequently, the global picture is a mixed one, with some countries experiencing higher trends in incidence and some tending toward lower incidence.

51. In 1991/92, WHO undertook an analysis of these trends and attempted to identify, to some extent, the factors that are responsible for these tendencies. A review was made of trends in mortality from diet-related non-communicable diseases² in 42 countries for which almost complete registration data was available for the period 1960 to 1989 (see Figure 7).³

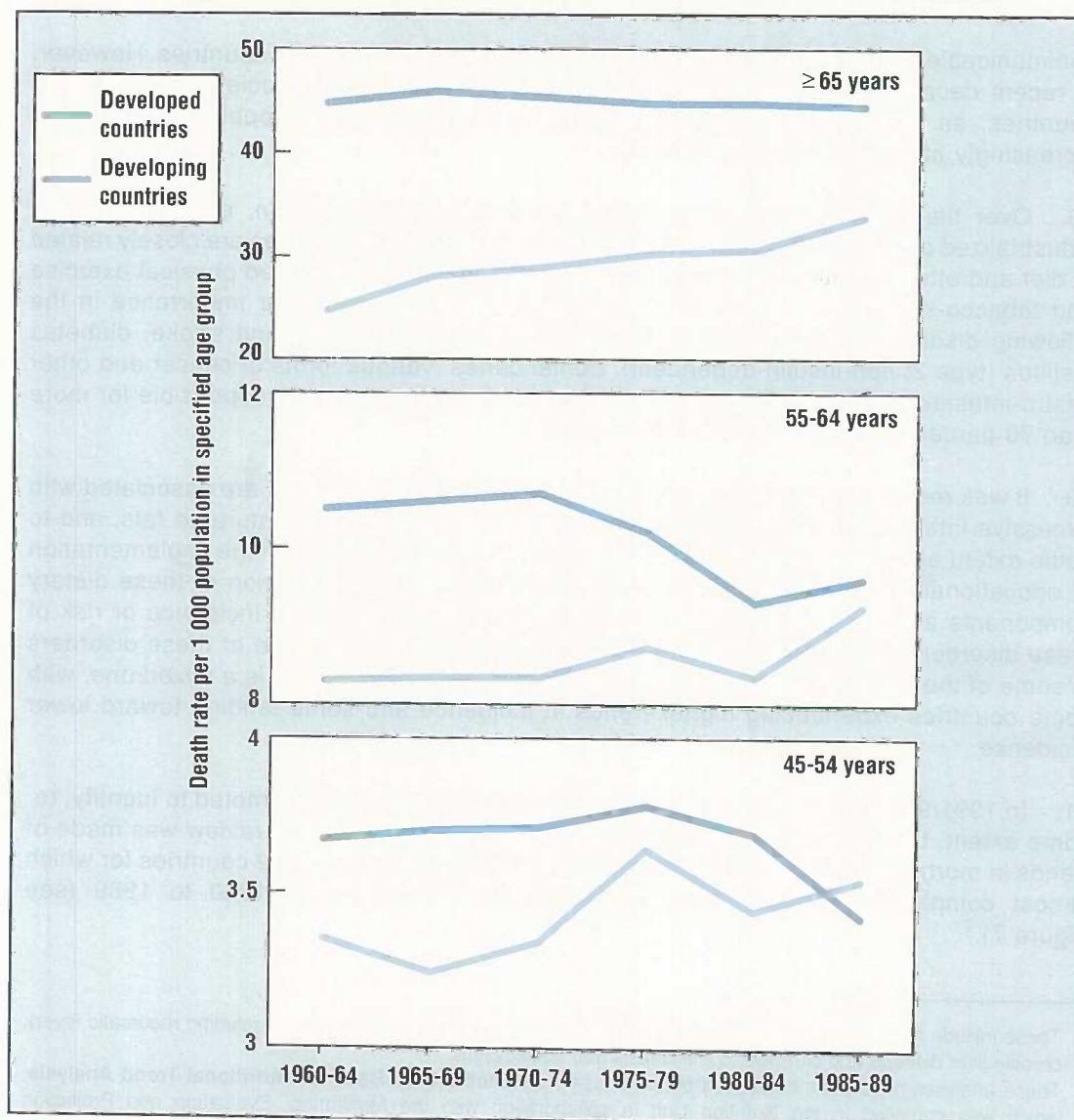
² These include malignant neoplasms, diabetes, obesity, circulatory system diseases (excluding rheumatic fever), chronic liver disease and cirrhosis, cholelithiasis and cholecystitis.

³ These analyses have been conducted by WHO using the **Global Data Base for Nutritional Trend Analysis**, which was compiled in the Nutrition Unit in collaboration with the Monitoring, Evaluation and Projection Methodology Unit.

52. Among the 42 countries, 26 are categorized as developed and 16 are considered to be developing countries. It should be noted that the latter group has better health statistics services and data than those found in many developing countries – nearly all of them are middle-income or lower-middle-income countries according to the World Bank's definition. The developed countries correspond roughly to the high-income and upper-middle-income economies.

53. The trends in age-specific mortality (number of deaths annually per 1 000 population of the specified age range) from these various causes are portrayed in Figure 8. In the segment of the population that is 45 to 54 years old, there was no significant change in the rates over the three decades in either developed or developing countries. However, in the 55 to 64-year-old group, there was a 9-percent decrease in the developed countries and a 11-percent increase in developing countries. Among those older than 65 years, there was no change in developed countries but a major (37 percent) increase in the developing ones.

Figure 8. Average age-specific death rates from diet-related non-communicable diseases



Source: WHO.

TABLE 5. Change of various parameters in countries with decreasing or increasing mortality¹ between 1960 and 1985

Parameters	Countries with decreasing mortality	Countries with increasing mortality
	<i>(percentage change)</i>	
Probability of dying under one year of age	- 63.7	- 63.2
Life expectancy	+ 8.2	+ 11.2
Urbanization ²	+ 17.5	+ 38.6
GNP	+ 445.3	+ 446.5
Calories ²	+ 8.9	+ 18.2
Protein (g/day) ²	+ 10.4	+ 21.3
Fat (g/day) ²	+ 23.5	+ 46.2

Source: WHO.

¹ Mortality rate from chronic diet-related non-communicable diseases of people 65 years of age and over.

² The difference between 1960 and 1985 is statistically significant at $p < 0.02$.

54. It is striking that in the group aged 45 to 54 years, the rates are the same in both developed and developing countries. In the age group 55 to 64, there is a slight difference. Among the elderly (65 years and older), the difference between the developed and developing countries is much greater, yet the gap has been narrowing in recent years, as the rates are declining in the developed countries but increasing in the developing ones.

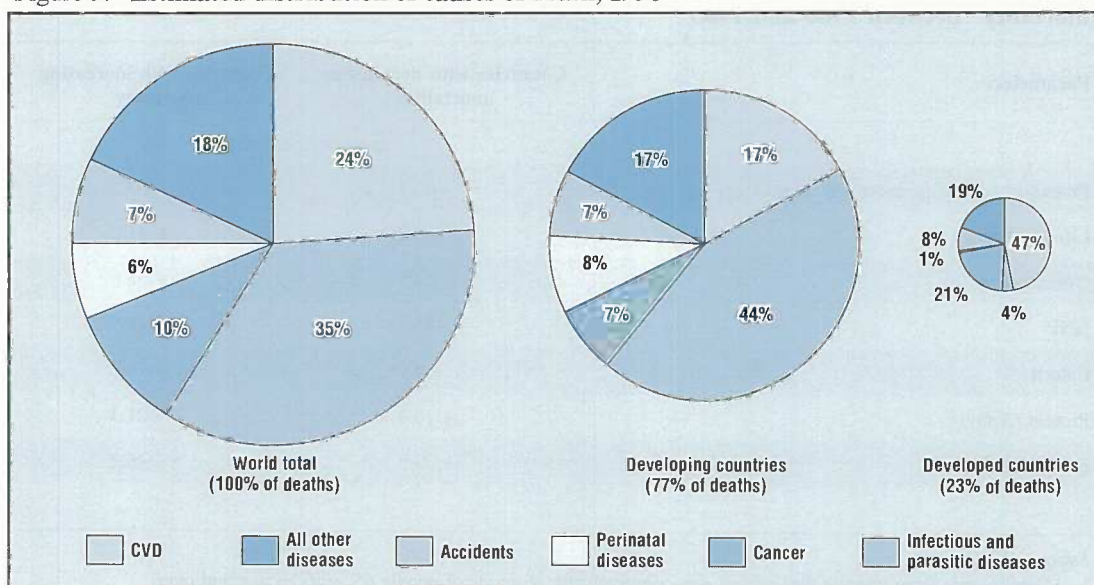
55. While the majority of deaths occur in the later years of life, the influences that affect causes of death operate throughout a lifetime. As changes in diet and lifestyle may take decades to affect the mortality rates, prevention measures should be implemented early in life.

56. Achievements in lowering the mortality rates from diet-related non-communicable diseases are illustrated in Figure 7, which shows the percentage change in mortality rates from diet-related diseases between 1960-1964 and 1985-1989 in 42 countries among people in the over-65-years age group. These rates decreased in 21 countries, of which 16 are developed and five developing. However, with the exception of Cuba, the decrease in these developing countries was small. Cuba, which is remarkable for its public health efforts and for its health statistics (which approach those of developed countries in several other respects), showed a significant decrease.

57. On the other hand, the mortality rate increased in 21 countries, of which ten are developed and 11 developing. Of those developed countries, four are in western Europe, but the increases were less than 5 percent, thus insignificant. Large increases were seen only in eastern European countries and in developing countries, and these rates of increase were far greater than the decreases in the developed countries.

58. The percentage changes in a number of parameters for countries that are grouped as having either decreasing or increasing mortality trends from these diseases are shown in Table 5. For three parameters — probability of infants dying under one year of age (infant mortality), life expectancy and GNP per caput — there were similar changes in both sets of countries.

59. The main factors that differ in the two sets of countries are the degrees of urbanization and food availability. From other evidence it appears likely that the most important dietary factors are the proportions of calories from fat and from saturated fat.

Figure 9. Estimated distribution of causes of death, 1990¹

Source: WHO.

¹ These estimates are based on: total number of deaths estimated by the UN Population Division; number of deaths by cause among children aged less than 5 years estimated by WHO programmes for developing countries; cause of death data reported by the developed countries for the World Health Statistics Annual; and on the assumption that the overall mortality pattern for the developing countries has not changed since 1985.

60. Characteristics of the countries at the two extremes of Figure 7 can be noted. The most marked improvements (decreases) were in Japan – a 27-percent decrease in deaths due to diet-related non-communicable diseases. These decreases are associated with favourable dietary patterns and improved medical care and health screening. Vigorous educational efforts to influence dietary intakes, especially to limit fat, saturated fat and salt intakes, and to promote healthier lifestyles have also been credited with bringing about the decrease in mortality from diet-related non-communicable disease in other countries.

61. At the other extreme are four developing countries that have evolved rapidly in terms of income, urbanization and adoption of unfavourable dietary patterns. Rates of increase in mortality exceeded 100 percent in Ecuador, Egypt and Thailand.

62. There is also an increase in the number of people living beyond 65 years in all countries, consequently the absolute number of deaths from these disorders is always increasing. The main concern is that increases in mortality rates from diet-related non-communicable diseases will occur in younger age groups and that an increasingly large proportion of the productive population will be affected by these diseases. This would have an unfavourable impact on families, communities and national development.

63. **Cardiovascular diseases.** Cardiovascular diseases (CVD) account for roughly 24 percent (12 million)⁴ of all deaths worldwide, representing the second-highest proportion among all causes of death. In developed countries, about 47 percent of all deaths are due to CVD, which are related to obesity and the amount of saturated fat in the diet, as well as to other aspects of lifestyle, notably smoking and exercise. In developing countries, the proportion of deaths due to CVD is only about 17 percent (see Figure 9). However, since 77 percent of all deaths occur in developing countries, the absolute number of deaths due to CVD is higher than in developed countries.

⁴ About 7 million out of these 12 million people are dying from CVD in developing countries.

64. WHO is monitoring the changing mortality and morbidity patterns of CVD, as well as the physiological, behavioural and other factors associated with these changes. WHO analyses show clearly that there are higher age-standardized mortality rates in men than women and that coronary heart disease causes many more deaths than cerebrovascular disease. In the period 1952 to 1967, coronary heart disease rates increased substantially in men in most countries, while among women there was an increase in a minority of countries. In the period 1970 to 1985, there was a substantial decrease for both sexes in nearly all countries except in those in eastern Europe and some southern European countries.

WHO PROJECTS TO ADDRESS CARDIOVASCULAR DISEASES (CVD)

In 1985, WHO launched a ten-year project known as MONICA – a name derived from "monitoring" and "cardiovascular" – to help public health authorities determine whether prevention programmes are effective. One of the largest research projects ever undertaken, MONICA follows trends in populations between the ages of 25 and 64 years in 26 countries through a network of 39 centres. Each centre keeps track of some 1 200 people who are representative of a population of 15 million. The results so far show that there are differences in mortality among the populations in the three French cities of Lille, Strasbourg and Toulouse. Mortality rates in Toulouse were lowest because the diet there is higher in oils, polyunsaturated fats, vegetables and fruit and lower in lipids from animal origin and saturated fats.

Other WHO projects to prevent and control CVD are under way. These include the following:

- **CARDIAC** (Cardiovascular Diseases and Alimentary Comparison). A study in 23 developing and developed countries that aims to determine the links between diet and high blood pressure. It is directed by the WHO Collaborating Centre at Shimane University, Izumo, Japan.
- **PEP** (Patient Education Project). This project involves eight countries. The major aim is to educate family doctors and nurses in methods of teaching patients with high blood pressure to manage their condition. The World Hypertension League is a partner in the project.
- **PBDAY** (Patho-Biological Determinations of Atherosclerosis in Youth). A five-year study carried out through 20 centres in 16 areas of the world, whose major aim is to determine how atherosclerosis develops, by studying the clogging of arteries in the young.
- **The Global Cardiovascular Diseases Monitoring and Prevention Project**. A recently established network comprising sites in developing countries linked to other MONICA sites, it aims to assist these nations in developing skills to carry out programmes of prevention. WHO is obtaining data from 27 countries, mostly in Europe, but also including Australia, Canada, Israel, Japan, New Zealand and the United States.
- **Programme on Prevention of Rheumatic Fever and Rheumatic Heart Diseases**. A project in developing countries, it aims to reduce the number of cases and deaths from these diseases that affect children. The International Society and Federation of Cardiology is a partner in the project.

It is clear that only a strong commitment by countries to provide funds, equipment and personnel for programmes of prevention will avert the impending epidemic of cardiovascular diseases.

Source: World Health. January - February 1992. Geneva, WHO.

65. While there has been considerable success in combating CVD in many developed countries, there is concern about the emerging increase of CVD in eastern Europe and developing countries. This is, in part, a result of the improvements in life expectancies. However, the increasing prevalence of major risk factors for these diseases, particularly among men in developing countries, has also played a very significant role.

66. **High blood pressure and stroke.** In contrast to ischaemic heart disease, there were consistent decreases in mortality from cerebrovascular disease from 1952 to 1985 in nearly all countries included in the MONICA study except those in eastern Europe. The declines were generally greater in the period 1970 to 1985.

67. High blood pressure is strongly associated with both coronary heart disease and stroke. Observational studies indicate that an increase in diastolic blood pressure of only 7.5 mm mercury increases the risk of coronary heart disease by 28 percent and the risk of stroke by 44 percent.

68. High BMI and high alcohol intakes have strong independent effects on blood pressure. Salt intakes, especially above 6 g per head per day, accentuate the progressive rise in blood pressure seen with age in some countries and in some individuals. Higher intakes of potassium and calcium have some mitigating effect.

69. Epidemiological studies consistently suggest that lower blood pressures occur among vegetarians than among non-vegetarians, independent of age, weight and pulse rate. In various developing countries — for example, Ghana, Kenya and Papua New Guinea — essential hypertension is of growing importance in urban rather than rural populations. Studies in Kenya showed that increased salt intake is the essential cause of this phenomenon.

70. **Obesity.** Obesity occurs in 7 to 15 percent of adults approximately 40 years of age in industrialized countries. However, it is not confined to affluent populations or high-income countries. Obesity is already prevalent in the developing world, particularly among the poor in middle-income countries and among the elite in low-income nations. For example, among urban women in several Caribbean countries, prevalence exceeds 30 percent. High rates of overweight are also evident in children (see Figure 10). Obesity is a risk factor for diet-related disease, including heart disease, hypertension, diabetes and some forms of cancer, with greater obesity leading to greater risk.

71. Obesity is largely attributable to environmental factors, especially diet and physical activity. As societies become more affluent and technology more mechanized, the demand for physical activity declines. This way of life may affect both adults and children. Excessive energy intakes, out of proportion to energy expenditures, may be a result of excessive intake of any macronutrient, but dietary fat is particularly conducive to weight gain. National and international analyses are consistent with the concept that as the proportion of energy derived from fat increases, so does the problem of obesity.

72. **Diabetes.** Non-insulin-dependent diabetes mellitus is by far the most common type of diabetes and is closely related to obesity and CVD. An apparent epidemic of diabetes is occurring in adults throughout the world. This trend appears to be strongly related to lifestyle and socio-economic change. The people in developing countries and the minority or disadvantaged communities in the industrialized countries now face the greatest risk of diabetes.

73. Epidemiological data for populations aged 30 to 64 years show that diabetes is absent or rare (less than 3 percent) in some traditional communities in developing countries, for example, among the rural population in the United Republic of Tanzania. Moderate prevalence (3 to 10 percent) is seen in most European and American populations and in some developing country populations. High prevalence (10 to 20 percent) is seen in some urban Indian, Chinese, Mauritian and urban Hispanic (United States) populations and in immigrants from the Indian subcontinent when they settle in the United Kingdom, the Caribbean, Singapore and the Republic of South Africa. Very high prevalence was found in urban and rural Fiji Indians, Australian Aborigines and Nauruan and Pima Indian populations.

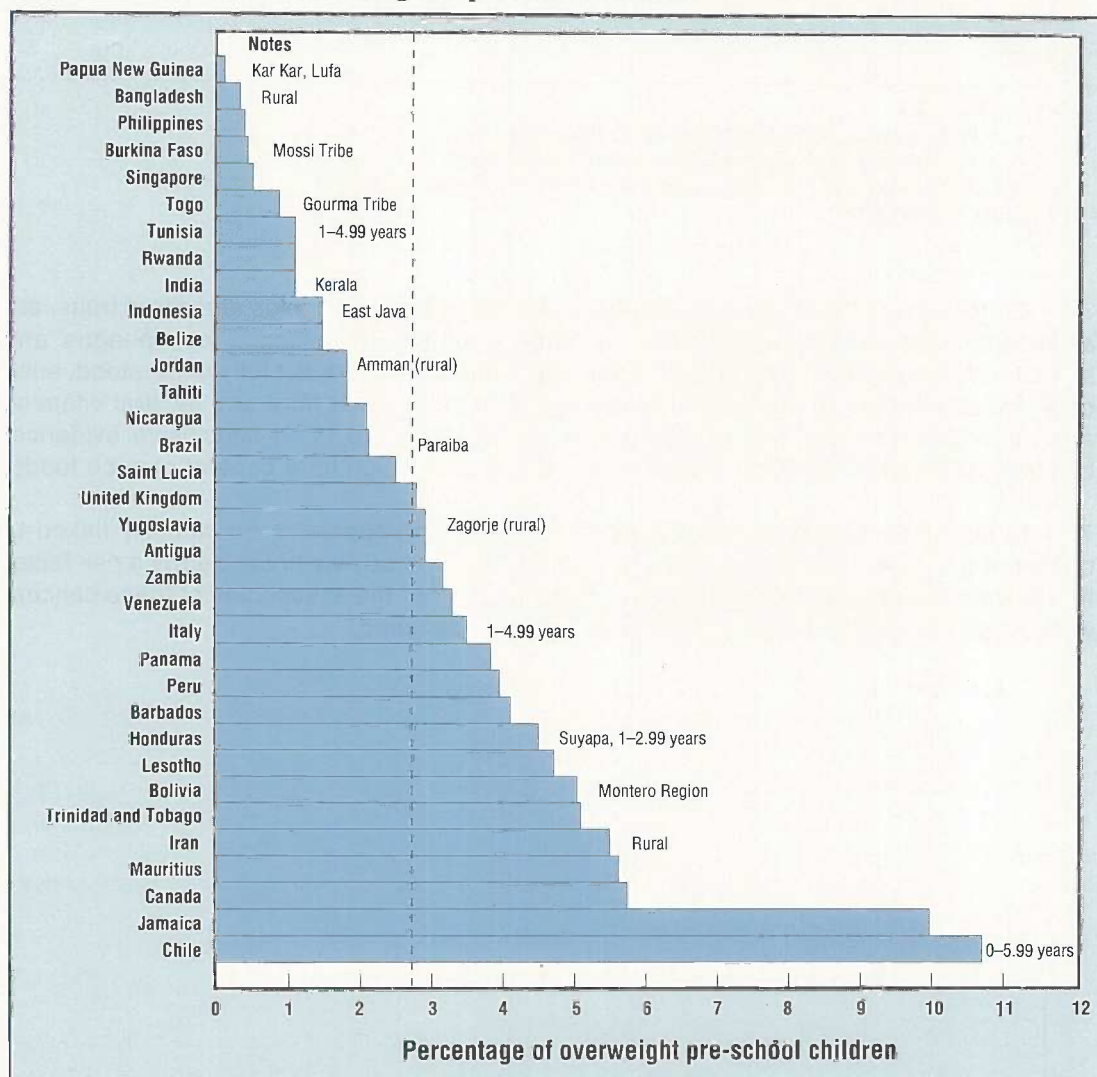
74. Non-insulin-dependent diabetes appears to be triggered by a number of environmental factors, including sedentary lifestyle, diet, excessive consumption of alcohol, stress, urbanization and socio-economic conditions. Diets high in plant foods and, specifically, vegetarian diets have been shown to be associated with lower risk of having diabetes as a direct or underlying cause of death. Recent epidemiologic studies have also indicated that low-birth-weight infants are at high risk of developing non-insulin-dependent diabetes

and CVD in later life. Similar results were found in the offspring of experimental animals consuming low-protein diets.

75. Other dietary factors contributing to this epidemiologic picture need to be further studied. However, these findings give some cause for concern about the possibility of a greatly expanded "epidemic" of diabetes in future years.

76. **Cancer.** After CVD, cancer is the second most frequent cause of death in developed countries and it accounts for 10 percent of all deaths worldwide. A review of the evidence indicates that there are associations between dietary components and various types of cancer (see Table 6). It is evident that a high intake of total and saturated fat is associated with increased risk of cancers of the colon, prostate and breast. The evidence is strongest for cancer of the colon and weakest for breast cancer. The epidemiological findings are not totally consistent, yet these conclusions are generally supported by laboratory data from studies in animals.

Figure 10. Prevalence of overweight in pre-school children^{1,2}



Source: WHO.

¹ Defined as a weight more than 2 SD above the reference median for weight-for-height.

² In a well-fed population approximately 2.7 percent of the children are expected to weigh more than 2 SD above the reference median.

TABLE 6. Associations between selected dietary components, body weight and cancer¹

Site of cancer	Fat	Body weight	Fibre	Fruit and vegetables	Alcohol	Smoked, salted and pickled foods
Lung				-		
Breast	+	+			+/-	
Colon	++		-	-		
Prostate	++					
Bladder				-		
Rectum	+			-	+	
Endometrium		++				
Oral cavity				-	+ ²	
Stomach				-		++
Cervix				-		
Oesophagus				-	++ ²	+

Source: WHO, 1990.

Key: + = Positive association; increased intake with increased cancer.

- = Negative association; increased intake with decreased cancer.

¹ Adapted and extended from "The Surgeon General's Report on Nutrition and Health DHHS, 1988".

² Synergistic with smoking.

77. Diets high in plant foods, especially green and yellow vegetables and citrus fruits, are associated with a lower occurrence of cancers of the lung, colon, oesophagus and stomach. Although the mechanisms underlying these effects are not fully understood, such diets are usually low in saturated fat and high in starches and fibre and several vitamins and minerals, including beta-carotene and vitamin A. There is no conclusive evidence, however, that these beneficial effects are a result of the high fibre content of such foods.

78. In addition, sustained heavy alcohol consumption appears to be causally linked to cancer of the upper alimentary tract and liver. Excessive body weight is clearly a risk factor for endometrial and post-menopausal breast cancers, but the association of these cancers with excessive energy intake *per se* is less well established.

Consequences of poor nutrition

79. Undernutrition and micronutrient deficiencies may result in a range of conditions that adversely affect the health and well-being of individuals. In severe cases, they can be life-threatening. Whether in their mildest or most severe form, the consequences of poor nutrition and health result in a reduction in the overall quality of life and in the levels of development of human potential. In addition, poor health related to malnutrition reduces the resources and earning capacity of households that are already poor, thus increasing their social and economic problems.

80. Malnutrition and poverty often exacerbate problems of unsustainable agricultural practices as a result of the desperate efforts of the poor to obtain adequate food. At the same time, the increasing incidence of diet-related non-communicable health problems is placing additional burdens on households and on health care systems. Malnutrition, often resulting from unsuccessful social and economic development efforts, in turn contributes to further declines in future human, economic and social development.

81. A number of temporary and permanent disabilities are caused by hunger, malnutrition, nutritional deficiencies and other diet-related diseases. There is much evidence that poor nutrition has a significant impact on reproduction, physical activity, child growth and development, learning capacity, work performance and overall quality of life and well-being. In addition, malnutrition lessens an individual's ability to fight infectious disease, compounding the extent and severity of illness among the poorly nourished.

82. **Among infants and young children** severe malnutrition is directly associated with high levels of mortality. Infants born with a low birth weight, linked to intra-uterine malnutrition and poor maternal health and nutrition, have a higher risk of subsequent growth retardation, morbidity and mortality than do other infants. Anaemia, when it occurs in infancy and childhood, is associated with significant loss of cognitive abilities as well as decreased physical activity and reduced resistance to disease. Intra-uterine growth retardation, low birth weight and increased perinatal mortality are all associated with maternal anaemia. Low birth weight is the single most powerful predictor of death in the first few months of life.

83. In addition to iron deficiency anaemia, other micronutrient deficiencies can have serious, debilitating or even fatal outcomes. Iodine deficiency in childhood can cause mental retardation, delayed motor development, growth failure, decreased physical activity, muscular disorders and paralysis, as well as speech and hearing defects. Vitamin A deficiency is the world's most common cause of preventable childhood blindness. Given the role of vitamin A in regulating the body's immune system, even mild vitamin A deficiency can lead to increased infections, stunted growth and higher rates of child mortality. Vitamin A deficiency appears to interact with a number of diseases, most notably measles.

84. Nutrition affects the intellectual development, learning capacity and school performance of children. Growth retardation due to undernutrition affects the development of motor and mental functions, while severe undernutrition affects brain growth as well as activity levels. Results of 20-year follow-up testing of malnourished children from the 1970s indicate early irreversible damage to intellectual development resulting from malnutrition. Malnutrition in pre-school years leads to stunting. Hunger during the school day affects attention and learning capacity. Ill health and chronic malnutrition, especially anaemia, persisting during the crucial early years of education can hinder learning capacity.

85. **Among women** poor nutritional status can have serious implications, as shown by indicators of their health, including incidence of anaemia. The physical stress of pregnancy and lactation results in additional nutritional demands for their health and well-being.

Maternal anaemia can result in death and contributes to intra-uterine growth retardation, low birth weight and increased perinatal mortality. Iodine deficiency in pregnancy causes spontaneous abortions, stillbirths and infant deaths and may lead to cretinism and impaired foetal brain development.

86. Poor maternal nutrition results in infants with low birth weight and high infant mortality. Although many factors influence the birth weight of infants (mother's stature, genetic endowment, hard physical work during pregnancy, infections, age, parity and birth spacing, smoking, presence of prenatal services, length of gestation, as well as nutrition), as much as 80 percent of low birth weight among infants is a result of poor maternal nutrition. Severe nutrition deprivation during pregnancy causes chronic intra-uterine growth retardation and can result in reduced growth potential. Women who were malnourished during their childhood are stunted, which in turn influences the birth weight of their children, perpetuating cycles of poor growth.

87. **Among adults** anaemia linked to iron or folate deficiency impairs resistance to disease and reduces physical activity and work capacity, with adverse effects on productivity and earnings. Diet-related non-communicable diseases, including CVD, some forms of cancer, obesity and high blood pressure, lead to impaired nutritional and health status or death.

88. Poor nutritional status can reduce productivity directly or indirectly through absenteeism and lack of motivation. In developing countries, where much of the work involves strenuous physical labour, poor nutrition can affect physical capacity and efficiency or competence of effort. There is evidence from various studies indicating a deterioration in physical performance with decreased nutrition and a reduction in muscle strength and endurance at work as body-weight loss occurs. Use of adult anthropometry to suggest the extent of malnutrition during childhood has linked long-term malnutrition to decreased worker productivity.

Bibliography for Chapter 1

- ACC/SCN. 1987. *First report on the world nutrition situation*. Geneva.
- ACC/SCN. 1989. *Update on the nutrition situation: recent trends in nutrition in 33 countries*. Geneva.
- ACC/SCN. 1990. *Appropriate uses of anthropometric indices in children*. State-of-the-art series. Nutrition policy discussion paper no. 7. Geneva.
- Doll, R. & Peto, R. 1981. *The causes of cancer*. Oxford, Oxford University Press.
- FAO. 1982. *Malnutrition: its nature, causes, magnitude and policy implications*. Committee on Agriculture. Rome, FAO. (COAG/83/6)
- FAO. 1984. *Integrating nutrition into agricultural and rural development projects: six case studies*. Nutrition in agriculture no. 2. Rome, FAO.
- FAO. 1985. *The fifth world food survey*. Rome, FAO.
- FAO. 1992. *The State of Food and Agriculture 1991*. Rome, FAO.
- Gillespie, S., Kevany, J. & Mason, J.B., eds. 1991. *Controlling iron deficiency*. ACC/SCN State-of-the-art series. Nutrition policy discussion paper no. 9. Geneva.
- Government of the United Republic of Tanzania, WHO & UNICEF. 1988. *The joint WHO/UNICEF nutrition support programme in Iringa, Tanzania: 1983-1988 evaluation report*.
- Gurney, M. & Gorstein, J. 1988. The global prevalence of obesity - an initial overview of available data. *World Health Stat. Quar.*, 41:251-254.
- Haddad, L. & Bouis, H. 1991. The impact of nutritional status on agricultural productivity: wage evidence from the Philippines. *Oxford Bull. Econ. Stat.*, 53(1): 45-67.
- Hetzl, B. 1988. *The prevention and control of iodine deficiency disorders*. ACC/SCN State-of-the-art series. Nutrition policy discussion paper no. 3. Geneva.
- James, W.P.T. 1991. *Body mass index: an objective measure for the estimation of chronic energy deficiency in adults*. Aberdeen, Rowett Research Institute.
- Keller, W.D. & Kraut, H.A. 1962. Work and nutrition. In G.H. Bourne, ed. *World Rev. Nutr. Dietetics*, Vol. 3:65-81.
- Keller, W.D. & Fillmore, C. 1983. Prevalence of protein-energy malnutrition. *World Health Stat. Quar.*, 38: 331-347.
- Keys, A. et al. 1984. The seven countries study: 2289 deaths in 15 years. *Prev. Med.*, 13: 141-154.
- King, H. & Rewers, M. 1991. Diabetes in adults is now a Third World problem. *Bull. World Health Organ.*, 69(6): 643-648.
- King, H. & Rewers, M. Global estimates for prevalence of diabetes mellitus and impaired glucose tolerance. (in press)
- Klein, R., Freeman, H., Kagan, J., Yarbrough, C. & Habicht, J. 1972. Is big smart? The relation of growth to cognition. *J. Health Soc. Behav.*, 13:219.
- Kramer, M.S. 1987. Determinants of low birth weight: methodological assessment and meta-analysis. *Bull. World Health Organ.*, 65(5): 663-737.
- Levin H. 1986. A benefit-cost analysis of nutritional programmes for anaemia reduction. *World Bank Res. Obser.*, 1: 219-246.
- Martorell, R. 1975. Acute morbidity and physical growth in rural Guatemalan children. *Amer. J. Dis. Child*, 129: 1296 - 1301.
- Mason, J.B., Habicht, J-P., Tabatabai, J. & Valverde, V. 1984. *Nutritional surveillance*. Geneva, WHO.
- McGuire, J. & Austin, J. 1987. Beyond survival: children's growth for national development. *Assignment Children*. New York, UNICEF.
- Monteiro, C. et al. 1991. Nutritional status of Brazilian children: trends from 1975 to 1989. Nutrition Unit. Geneva, WHO. (mimeo)
- Pollitt, E. 1990. *Malnutrition and infection in the classroom*. Paris, UNESCO.
- Reutlinger, S. & Selowsky, M. *Malnutrition and poverty: magnitude and policy options*. World Bank staff occasional papers no. 23. Washington, DC.
- Sahn, D. & Alderman, H. 1988. The effects of human capital on wages, and the determinants of labour supply in a developing country. *J. Devel. Econ.*, 29:157-183.
- Spurr, G. 1984. Physical activity, nutritional status and physical work capacity in relation to agricultural productivity. In E. Pollitt & P. Amante, eds. *Energy intake and activity*. New York.
- Strauss, J. 1986. Does better nutrition raise farm productivity? *J. Pol. Econ.*, 94: 297-320.
- UNICEF. 1991. *State of the world's children*. New York.

- Uemura, K. & Pisa, Z.** 1988. Trends in cardiovascular disease mortality in industrialised countries since 1950. *World Health Stat. Quar.*, 41: 155-178.
- US Department of Health and Human Services.** 1988. *The Surgeon General's report on nutrition and health.* Washington, DC.
- WHO.** 1982. *Prevention of coronary heart disease.* WHO technical report series no. 678.
- WHO.** 1986. *Community prevention and control of cardiovascular diseases.* WHO technical report series no. 732.
- WHO.** 1987. *Evaluation of the strategy for health for all by the year 2000.* Geneva.
- WHO.** 1988. Noncommunicable diseases: a global problem. *World Health Stat. Quar.*, 41(3/4).
- WHO.** 1990. *Diet, nutrition and the prevention of chronic diseases.* WHO technical report no. 797. Geneva.
- WHO.** 1991. *Country studies on nutritional anthropology Brazil 1989.* Geneva.
- WHO.** 1992. *World Health Stat. Ann. 1991.* Geneva.
- WHO.** 1992. Implementation of the global strategy for health for all by the year 2000, second evaluation; and Eighth report on the world health situation (document A45/3).
- WHO.** 1992. National strategies for overcoming micronutrient malnutrition (document A45/17).
- WHO.** 1992. Medium and long term forecasts of prevalence and numbers of malnourished children: global and regional level models. A report submitted to FAO/WHO by A. Kelly.
- WHO/FAO/UNU.** 1986. *Expert consultation: energy and protein and requirements.* Geneva.
- Wolgemuth, J., Latham, M., Hall, A., Chesher A. & Crompton D.** 1982. Worker productivity and the nutritional status of Kenyan construction workers. *Amer. J. Clin. Nutr.*, 36: 68-78.

Chapter 2

Factors influencing nutritional status

1. The factors affecting an individual's nutritional status are many and diverse. Virtually anything that contributes to either inadequate or excessive nutrient intakes, or that impairs their optimal utilization, contributes to malnutrition. The factors most directly influencing nutrition can be grouped under the broad categories of food, health and care. These groupings encompass a number of issues including: the availability of, access to and consumption of safe and good quality food; individual health status, lifestyles and utilization of health care services; and the ability of the household and the community to care for, or provide the time, attention, support and skills to meet the needs of vulnerable individuals.

2. Each of these – food, health and care – is essential for good nutrition. For instance, good infant feeding practices and nutrition are dependent upon all three aspects – availability of and access to food, health practices and care in the home. These aspects are also interrelated, and actions affecting one area may have significant consequences for another. For example, adoption of sustainable and labour-saving agricultural technologies may influence nutrition not only through improved food supplies and income, but also through their beneficial impact on sanitation and health and on the time available for providing adequate care to household members. Development policies, which affect the economy and the society as a whole, usually are not included in the domain of nutrition as such. However, the impact of many of these policies on the nutritional well-being of the population is considerable and may be monitored through their effects on food, health and care.

3. Poverty, however, is the root cause of undernutrition. Both acute and chronic undernutrition and most micronutrient deficiencies primarily affect the poor and disadvantaged, who cannot produce or procure adequate food, live in marginal or unsanitary environments without access to clean water and basic services, lack access to appropriate education and information or are otherwise socially disadvantaged. However, overnutrition and dietary imbalances, which may lead to chronic diseases, cut across many socio-economic boundaries. In addition to affecting the more affluent in all countries, overnutrition also affects lower-income groups in middle- and high-income countries.

4. In this chapter, the factors that have a direct influence on nutrition — grouped under food, health and care — are discussed. The wider development policies, including economic development policies, macro-economic policies and structural adjustment, agricultural policies, health policies, environmental policies, population policies and urbanization and the international economic environment, are the subject of Chapter 3.

Food and nutrition

FOOD CONSUMPTION

5. Nutritional well-being is influenced by the nutrient content of foods consumed in relation to requirements that are determined by age, sex, level of physical activity and health status, as well as the efficiency of nutrient utilization by the body. Infectious diseases, in particular, affect dietary intake and nutrient utilization. The synergistic relationship between inadequate food intake and infectious disease is so strong that the separate role of each is difficult to assess.
6. A diet is adequate when it provides sufficient energy, protein, fat, carbohydrate, micronutrients (vitamins and minerals) and other essential components, including dietary fibre, to meet the body's needs in a balanced, diversified and culturally acceptable manner. If intakes are too low, nutritional deficiencies may occur. On the other hand, if intakes are excessive, other nutrition-related problems may arise. Adequate nutrient intakes are needed to meet energy expenditures of metabolism, activity, response to disease and growth. With pregnancy and lactation, nutrient needs including energy and protein are increased.
7. As recently as the 1970s it was widely believed that protein deficiency was the major cause of malnutrition, and considerable efforts were made to increase the consumption of protein-rich foods. Furthermore, emphasis was often placed on promoting "high quality" protein from animal sources. It is now understood that diets based on cereals complemented by legumes have amino-acid patterns that provide an adequate level of protein, assuming that sufficient quantities of food are consumed to meet daily energy requirements. Indeed, energy deficiency is a far more significant problem than protein deficiency among those populations where inadequate food intake results in child malnutrition.
8. Since infants and young children can consume only a limited amount of food at one time, the nutrient and energy density of their food is particularly important. Even where food is plentiful, lactation is the most energy-efficient and economical way of providing the dietary needs of the very young. During the first four to six months of life, no food or liquid other than breast milk, *not even water*, is required to meet the normal infant's nutritional requirements. A major advantage, with potentially significant consequences for the nutritional status of infants, is the protection breast milk provides against infection.
9. From the age of about four to six months – the precise timing depends on individual circumstances – infants can begin to receive, in addition to breast milk, a variety of safely prepared, locally available foods that are rich in energy to meet their changing nutritional requirements. Bulky, low-energy-dense foods, unless supplemented with oil, may not provide children with adequate calories. Mothers are advised to continue breast-feeding their children up to two years of age, or beyond if they wish.
10. Excessive and unbalanced dietary intakes often increase the risk of several major chronic diet-related non-communicable diseases, including atherosclerosis, coronary heart disease, hypertension, stroke, diabetes and some types of cancer. In addition, the problems of excessive and unbalanced intakes are compounded by other factors such as alcohol and tobacco use, stress and reduced levels of physical activity due to changing lifestyles, primarily in urban areas. Genetic predisposition is also an important factor and individuals differ in their susceptibility to the adverse effects of different factors.
11. In transition from a rural to more urbanized way of life, people often consume diets that are typically higher in protein, fat and refined carbohydrates, and lower in complex carbohydrates and dietary fibre. These trends in food consumption often correspond to

increased access to and availability of a wider variety of food in urban areas. Consumption of a variety of fruits and vegetables, meat, fish, dairy products, vegetable oils, sugar and refined grains tends to be higher overall in urban areas, while the consumption of tubers, whole and coarse grains and legumes and pulses is lower. Poor people living in urban areas, however, often cannot afford the wider variety of foods offered and must rely on a limited number of low-priced staples.

FOOD AVAILABILITY AND ACCESS TO FOOD

12. Stable food availability at the national, regional and household levels is a cornerstone of nutritional well-being. Therefore, strengthening the food production base is a prerequisite for improving nutrition in most low-income food-deficit countries. In addition, agriculture, including fisheries and forestry and related rural industries, provides income for the landless and their families, who are often among the most nutritionally vulnerable groups. Some of the most urgent problems to be addressed are: the need to increase the productivity and living standards of small-scale producers and those who are disadvantaged in terms of soil, climate, or remoteness; the need to maintain returns to producers that will enable them to adopt productivity-enhancing and labour-optimizing technologies; and the need to give adequate support to agriculture within development budgets that are already strained. It is only through concerted efforts to reduce social inequity and poverty that lasting solutions to nutritional problems will be found.

13. Nutrition problems are not solely related to overall food supplies. Frequently the problem is that the poor do not have the purchasing power to secure access to the food they need. Thus, while the availability at the aggregate level of adequate amounts of safe and nutritious foods is a prerequisite to meet a population's needs, adequate access to supplies by each household is essential. The concept of household food security means that the household must have physical and economic access to foods that are adequate in terms of quantity, quality and safety. This in turn depends on the household having access to the resources – food, income and assets – needed to secure an adequate diet, without undue risk of losing such access. Increased production of food for personal consumption, as a source of income and to help stabilize prices can all improve nutrition.

14. In developing countries, where approximately two-thirds of the population live in rural areas, crop and animal production, fisheries and forestry are direct sources of food and provide income with which to buy food. Virtually all communities in the world, however remote, rely on markets to some degree. Therefore, the terms of trade, the efficiency of marketing systems, the existence of fair prices for producers and consumers, the status of a household as net food buyers or sellers and the assets the family owns, including the amount and quality of land, are all important determinants of nutritional status. Landless labourers and their families, who obtain food with wages that are often irregular and uncertain, are among those most threatened by food insecurity. In countries where necessary land reforms have not been implemented, the tenants on small farms form another highly vulnerable group. In urban areas where people purchase most of their food, the poor are vulnerable to food price fluctuations and to changes in employment conditions and in the level of their earnings.

15. Improving the nutrition of the poor household is closely related to increasing its income and assets. However, poverty is not only characterized by low incomes and assets leading to low levels of consumption, but also by low levels of education, poor housing and sanitation. The degree to which increased income will be transformed into improved food consumption and family care in the short run depends upon the current level of income and education, especially of the mother, as well as the socio-cultural characteristics of the group that may influence decision-making. When the mother has a controlling hand in household expenditures, children receive more benefits.

16. The seasonality of production in developing countries also influences access to food by creating different patterns of food availability, flows of cash income into the household from both crop sales and farm wage labour, peaks in farm labour (and therefore energy expenditure) and in food prices. Seasonal agricultural patterns may lead to periods of stress in energy balance, which often coincide with the incidence of infectious diseases. Where the year's rainfall is concentrated into a single season, for example in West Africa, malnutrition is most severe during the pre-harvest wet season when food stocks have been depleted. Therefore, the lowest seasonal intake levels coincide with high energy expenditure for farm work, high food prices, high infection levels and often heavy indebtedness.

17. Access to food in rural areas is also influenced by the mix of crops, including the staple, secondary and non-food cash crops. Recent research shows that the adoption of non-food cash crops has a generally positive impact on nutrition as it increases incomes of rural producers and consequently their capacity to purchase food, if needed. Although effects such as declines in food crop diversity, uneven infusions of cash, market and production risks, reduction of land area or quality used for food crops and shifts in cash incomes from female to male workers may be detrimental, the benefits of increased cash income and flow have been, on the whole, positive. Cash crops are usually complementary to food crops and the income generated from the sale of cash crops can be used to supplement food production with foods obtained from the market.

18. The type of agricultural system in use has implications for employment, especially for landless labourers who are often the poorest and most nutritionally vulnerable members of society. Employment generation and wage labour income in rural areas are key determinants of nutritional status among the poor. There is also an important nutritional aspect involved in energy expenditure in farming and household systems as high levels of energy expenditure can result in malnutrition. Labour-saving technologies may be beneficial, but in areas of high unemployment they should not be labour-displacing. Agricultural practices can also significantly affect nutrition through their impact on the environment and health status (i.e. the effects of migration and pesticide use) and on care and feeding practices.

FOOD QUALITY AND SAFETY

19. To ensure that food is safe and that food quality is maintained during production, handling, processing and packaging, an effective food quality control system is necessary. Proper food control measures also help to reduce food losses and to promote a healthy diet. In addition, assuring the quality and safety of foods stimulates world trade of food and results in the creation of jobs, increased incomes and ultimately improved nutritional status.

20. Food quality control is important to both rural and urban populations. Keeping food safe and preserving its quality depends on precautions and controls that span the entire range of the food production chain. The need to prevent microbial and chemical contamination of food is universal. If foods are improperly processed, they can expose consumers to various contaminants. In addition, processed foods have to be prepared and packaged so as to ensure that they meet basic food quality and safety standards, including those measures to fortify and enrich foods with necessary nutrients where appropriate.

21. Concern is also widely expressed about contaminants in the environment, such as pesticide residues and other agricultural chemicals. While their presence in most foods remains at what are judged to be safe levels, efforts to assure continued food quality and safety are needed to protect consumers and promote international trade.

22. Education in the hygienic handling and processing of food is as relevant in the food industry as it is in the home. Simple precautions can do much to keep food safe in the home, small shops and eating places. Education and training, backed up by well-enforced

codes of practice, can achieve similar results in the food industry. Consumer education through various means, including the mass media, food and nutrition labelling and feeding programmes, is of particular importance.

23. Poor food quality and food-borne diseases can have major social and economic consequences. For countries that have limited resources in particular, the social and economic consequences are sometimes catastrophic. Food-borne diseases in themselves cause loss of income and work output and increase medical care costs. Foodstuffs with contaminants at levels above the limits permitted by importing countries may be rejected. Also, a country's reputation for poor food quality may result in a decrease in trade and export earnings, as well as in tourism.

Health and nutrition

MALNUTRITION, INFECTION AND ENVIRONMENTAL HEALTH

24. Good health and sanitation are essential for good nutrition, yet they are beyond the reach of the majority of the world's population. Adequate amounts of clean water, effective environmental sanitation, hygienic household practices, the control of vectors and utilization of health services all contribute to improved nutritional status. Conversely, conditions that increase exposure to health risks increase the chances of malnutrition. Diarrhoeal diseases, measles, acute respiratory infections (ARI), tuberculosis and, more recently, Acquired Immunodeficiency Syndrome (AIDS) have major impacts on nutritional status. Among the most nutritionally significant parasitic infestations are malaria, hookworm, ascariasis, amoebiasis and schistosomiasis.

25. Infection with HIV – the cause of AIDS – and its associated infections, especially chronic diarrhoea, lead to weight loss and nutritional deterioration that are so well recognized that the disease was initially known as the "slim disease". The next decade will see a tenfold increase in HIV infection. Levels of malnutrition can be expected to increase and have indirect repercussions on food production through diminution of the available workforce. Eventually the general (HIV-negative) population will be at risk of malnutrition, especially orphans whose parents have succumbed to AIDS.

26. In poorly nourished persons, disease and illness tend to be more frequent, more severe and prolonged. Nutritional requirements are higher during and following infectious episodes, with fevers in particular increasing energy requirements. Chronic infections, or frequently recurring episodes of acute infections, can make it almost impossible to maintain an adequate nutritional status merely by increasing dietary intake. Poor nutrition in turn plays an important role in disease generation by compromising the integrity of epithelial tissues and the immune system.

27. The mechanisms by which infections can be harmful to the nutritional status of children include: reduced food and water intake due to anorexia; diminished absorption and utilization of ingested food; increased nutrient and water losses; increased metabolic demands and therefore higher nutritional requirements; alteration of metabolic pathways; and the intentional reduction or complete withholding of food. Specific nutritional concerns may be associated with various disease states. Dehydration during diarrhoea is a major killer of children. Vitamin A deficiency may also be precipitated by episodes of infections, especially diarrhoeal disease and measles, and may lead to blindness and death. Iron losses are caused by hookworm infestations. Malaria causes initially a haemolytic anaemia, but commonly an iron deficiency occurs during the period of recovery from malaria. Deficiencies of vitamin A, iodine, iron and zinc all have an impact on the immune system.

28. It is often difficult to determine whether the main cause of growth retardation in the child is infectious disease or inadequate diet. In fact, the two act synergistically, each aggravating the effects of the other to produce what has been termed the malnutrition-infection complex. The combined impact of infectious diseases and inadequate diet during illness may be of little consequence for well-nourished children. But in underweight children, episodes of infection are more serious and protracted. Breaking this malnutrition-infection complex is crucial if lasting improvements in nutritional well-being are to be achieved.

29. Food-borne diseases are widespread in both developed and developing countries. Acute food-borne diseases are due to pathogenic bacteria, viruses, parasites or acute intoxications caused by chemical contaminants. These infections give rise to an estimated 1 500 million episodes of diarrhoea annually in children under five years of age, resulting in the death of over three million of them.

30. It is estimated by WHO that up to 70 percent of all cases of diarrhoea are food-borne in origin. Weaning foods contaminated with *E. Coli* contribute to as much as 25 percent of the diarrhoea cases. Commonly, diarrhoea causes tissue breakdown and anorexia with subsequent undernutrition, especially in young children. In addition, some pathogens can lead to abortion, premature delivery or malformation of the foetus.

31. Chronic or recurrent diarrhoea can also lead to protein-energy malnutrition, anaemia and vitamin A deficiency, particularly in young children, causing growth faltering and impairment of the immune system, weakening resistance to other infectious diseases.

32. Of all illnesses, diarrhoea (often food-borne) has the greatest negative impact on the growth of infants. Food-borne diseases are a significant health problem for adults as well. The elderly and immunosuppressed individuals (for example, cancer and AIDS patients) are particularly sensitive to the health effects of food-borne pathogens.

33. Environmental sanitation, water supply and the safety of food are important determinants of nutritional and health status. Contamination of water sources is determined by such sanitary habits as excreta and garbage disposal, although water availability itself is often the most important variable. Improved water and sanitation are associated with decreased diarrhoeal disease, improved nutritional status and lower childhood mortality. The impact of these improvements is dependent on other factors such as income and educational levels. An important benefit of providing potable water in close proximity to homes is the reduction in time and energy spent by women in collecting water.

34. Food inspection helps to protect rural and urban consumers from the health hazards of perishable foods marketed through local distribution systems. Meat from diseased animals, milk mixed with contaminated water and lack of refrigeration for dairy plants in rural areas pose serious health risks. Food contamination leading to infectious disease, such as typhoid and acute diarrhoea, can result in poor nutritional status, especially for those at risk, such as young children. Within households, proper food handling and hygiene are necessary to avoid food-borne diseases. In urban areas, where the consumption of prepared street foods is becoming more common, pathogenic organisms may be introduced into raw materials and ingredients through improper food handling.

35. Agricultural practices have important implications for the health of rural communities. For instance, irrigation schemes have increased breeding sites for malaria and schistosomiasis disease vectors. Increasingly, there are competing demands between the need for water for irrigation and the need for this essential resource for human uses. Indeed, this dilemma needs to be resolved since the potential for harmful effects from irrigation must be weighed against the benefits of increased food supplies and incomes which irrigation can bring. Furthermore, improper use of agricultural chemicals leads to health hazards.

LIFESTYLES AND DIET

36. Healthy lifestyles, which help to increase an individual's sense of well-being, can act as a buffer against illness. These include eating a balanced diet, getting regular physical exercise, reducing stress and avoiding abuse of alcohol and tobacco. Smoking of tobacco continues to be a worldwide health concern, as it is directly related to increased cancer mortality and heart disease and because of its effects on the nutritional status of the foetus.

37. Diet-related non-communicable diseases are associated with several risk factors, including heredity and environmental factors. Population-based evidence gathered in recent epidemiological studies confirm the importance of diet and lifestyle where shifting patterns of malnutrition are concerned. The dynamic relationship between changes in diet, a decrease in infectious diseases and increasingly sedentary lifestyles is typified by shifting

disease and mortality profiles in many areas that are undergoing rapid social and economic change. A case in point is eastern Europe, where recent studies indicate a decrease in life expectancy in the region's less-developed areas even as infant mortality rates continue to decline.

38. Although diet-related non-communicable diseases have been found mainly among affluent populations, they are becoming concerns of the poor and middle classes in industrialized countries. Furthermore, they are emerging as public health problems in many developing countries. In many of these countries there has even been a marked shift from problems of undernutrition towards those related to excessive and unbalanced dietary intake.

39. Diets that include plenty of fruits, vegetables, legumes and whole-grain cereals are associated with a lower occurrence of these chronic diet-related illnesses. Diets associated with reduced risks of heart disease and some cancers are not excessive in energy and fat (especially saturated fat and cholesterol), they contain foods with adequate amounts of complex carbohydrates and dietary fibre, as well as vitamins and minerals, and are moderate in salt content.

40. Obesity, often related to excessive energy and fat intake, increases the risk of high blood pressure, stroke, diabetes and coronary heart disease. Excessive alcohol consumption is related to a variety of health problems as well as to social problems related to dependency. In some people high salt intakes are related to increased blood pressure. High intakes of dietary fats, especially saturated fats, are linked to high serum cholesterol, a risk factor for coronary heart disease. The relationship between diet and cancer is less well established although evidence suggests that diets high in fat are related to some types of cancer, including those of the colon, the prostate and the breast. In some populations, stomach cancer is associated with diets containing large amounts of smoked and salt-preserved foods. In addition, the frequency of consumption of sugar and other refined carbohydrates is strongly associated with dental caries.

AVAILABILITY OF AND ACCESS TO HEALTH CARE

41. Various health services can improve nutritional status: immunization contributes to breaking the dangerous partnership between malnutrition and infection; curative services shorten the disease episode; and oral rehydration therapy reduces the severity and consequences of diarrhoeal disease. Adequate feeding during and after diarrhoea hastens recovery. The risk, severity and impact of diarrhoea in the first six months of life are greatly reduced if infants are exclusively breast-fed. The provision of antenatal care can improve birth weights. At the time of birth, delivery practices exert a great influence on the initiation and establishment of breast-feeding. Targeted supplementation programmes for iron, vitamin A and iodine may be an effective health intervention.

42. Utilization of health services is determined by the availability of services, trained personnel, infrastructure and essential drugs and the willingness of people to seek the services. These factors are intertwined and depend on the support that the health personnel receive, their ability to work and their job satisfaction. The acceptability and quality of the health services, their accessibility and the relationship between provider and patient are important influences on the use of services.

43. Primary, secondary and tertiary health services have a vital role to play in preventing malnutrition and improving nutrition. While the patient's main concern is with curative services at the neighbourhood-centre level, other elements of primary health care are needed to sustain adequate nutrition. These are health education, safe water and basic sanitation and maternal and child health (MCH) care, including family planning,

INDONESIANS MOBILIZE TO PROMOTE NUTRITION AND FAMILY PLANNING

In Indonesia, policy-makers recognize that high fertility levels compound the difficulties of meeting demands for land, employment and services and present serious constraints to achieving nutritional goals. Strategies that simultaneously serve the needs of increasing numbers of people and encourage smaller families are being developed.

Indonesian health professionals view better nutrition and family planning as essential and inseparable goals for improving the quality of life. In 1990, the population of Indonesia reached 179 322 million people. While the rate of growth has slowed significantly, from 2.32 in 1971-1980 to 1.97 in 1981-1990, the high number of youth in Indonesia's population (more than 64 million under the age of 15) implies that population growth will be rapid throughout the next century.

Indonesia's family planning programme, led by the National Family Planning Coordinating Board (BKKBN), has achieved remarkable success in lowering fertility rates. When the family planning programme began 20 years ago the crude birth rate was 43 per 1 000, currently it is 28 per 1 000. While many social factors contributed to the lowering of birth rates, the knowledge and use of family planning techniques has been the main cause of fertility decline.

Despite the improvements in dietary intake and child-care feeding practices that have occurred, Indonesia still faces serious nutritional problems in four areas: protein-energy malnutrition (PEM), vitamin A deficiency, iodine deficiency disorders (IDD) and nutritional anaemia.

Volunteer health promoters are the key

One of the most important mechanisms through which the Indonesian Government is intervening to address nutritional problems is the Family Nutrition Improvement Effort (UPGK). Since professional staff have difficulty in serving the population of almost 200 million, many of whom live in rural communities throughout the archipelago, Indonesia relies upon volunteer health promoters, known as *kaders*.

Much of the success of nutrition and family planning programmes can be attributed to those volunteers who work in community health posts, known as *posyandu*. The number of centres has expanded rapidly in recent years. There are currently 231 589 *posyandu* throughout the country. Volunteers provide such nutrition services as growth monitoring and supply nutrition packages, including iron supplements, vitamin A capsules and Oralite. They record and report information for nutrition surveillance and promote nutrition education slogans. In addition to their efforts to improve nutrition, *kaders* promote family planning messages such as the concept of an ideal family size (the happy, prosperous family of parents and three children) and provide family planning advice. Since the health promoters are from the community and have a small case-load, they are well-acquainted with their clients, which makes discussion of delicate issues regarding nutrition and family planning less difficult.

Adapting traditional values to modern life

The Indonesian strategy takes advantage of the existing social structure and social relationships to promote their programmes. The population policy is widely supported; indeed, the wives of officials at every level of government are involved in carrying out the programmes. The public support of religious and traditional village leaders is actively sought. Traditional cultural values, such as sharing of responsibilities and togetherness, facilitate implementation of the nutrition and population programmes. At the same time, Indonesians do not hesitate to promote changes in cultural practices when necessary.

While macro-economic trends certainly affect a country's ability to cope with nutritional problems and to bring about demographic change, the experience of Indonesia demonstrates that improved nutrition and lowering of fertility rates need not wait until broad socio-economic changes occur. Indeed, population projections, nutrition indicators and agricultural statistics have convinced Indonesian planners and policy-makers that these interventions cannot be postponed if the gains made to date are to be sustained, much less surpassed.

immunizations, control of endemic diseases and provision of essential drugs. The key focal point of local health services as regards nutrition is the MCH services. The establishment of a network of MCH services with emphasis on the practice and promotion of growth monitoring of children is one of the most important public health actions to prevent undernutrition. When growth faltering occurs, the causes – whether dietary or related to feeding practices or socio-economic problems – are identified and appropriate action is taken. Given the present economic circumstances faced by many poor countries, the

coverage by such peripheral health services remains very low. Due to financial constraints, mobile services that were common in the past have been forced to disband. At times the current hardships have lowered the quality of these services. Such circumstances are high-risk factors for malnutrition.

44. It is recognized that there is poor coverage of communities by formal health services. The essence of the primary health care concept is that communities participate in and organize the essential elements of their own health care, with the support of the nearest health centre. Since the Alma Ata Conference this process has been extended to reach a substantial number of communities in most countries, although more need to be reached. Very often this is carried out through the creation of a village health committee and the training of community health workers. The extent of community awareness of health issues and the capacity to develop a health programme at the community level are other important determinants of nutritional status, since all aspects of health care impinge on nutrition. The existence of such grassroots activities is an important determining factor of young child and maternal nutrition.

Care and nutrition

AT THE HOUSEHOLD LEVEL

45. Care itself is an essential element of good nutrition and health. Malnutrition can occur even when a household has access to adequate amounts and types of food as well as access to appropriate sanitation and health services. While adequate incomes, greater food availability and expanded health services are necessary for improved nutrition, these will not bring improvements unless households are able to take advantage of them. In addition to the need to enhance the ability of the household to take care of family members, nutrition improvements for disadvantaged and vulnerable groups may also depend upon society's capacity and willingness to assist them.

46. Care is the provision in the household and the community of time, attention and support to meet the physical, mental and social needs of the growing child and other family members. It leads to the optimal use of human, economic and organizational resources. Particularly in the context of child nutrition, care allows for the best use of household food resources for the feeding of children. It implies the effective use of resources to protect children from infection, to attend to a child during illness and to assist others who may be unable to care for themselves because of disability or old age. More generally, care includes nurturing full psychological and emotional well-being. These are goals in themselves and in turn they can benefit nutrition and health. Emotional support including a sense of security is understood to be a significant determinant of child nutrition in the early stages of life.

47. Providing individual care within the household is an important aspect of human behaviour. The type of care given is based on a household's resources and the attitudes of those who make decisions regarding the use of these resources. If people are to protect and to improve their own nutritional status and the status of those in their care, they require basic information about nutritional and health needs and how best to meet them with available resources. In addition to having the economic means, household heads and primary care-providers also require the time, energy and motivation to ensure the equitable well-being of all members and to put their knowledge into practice. Achieving good nutrition depends on a variety of foods, goods and services being available, but most importantly it depends on people having the capability to use them effectively.

48. The knowledge, attitudes and practices of household members, particularly of the household head and the primary care-provider, largely determine the nutritional status of the household. Malnutrition may arise from an incomplete understanding of the body's changing nutritional needs throughout the life cycle and of how to best meet those needs with available foods. Food taboos and fads, inappropriate eating habits, poor food preparation techniques and inadequate understanding of health risks, special dietary needs and physiological states all contribute to poor nutrition. While none of these practices is easily changed, nutrition education can be an appropriate and effective intervention in helping to prevent and correct nutrition problems.

49. Care-givers may include the mother and the father, as well as others. However, it should be noted that, in many countries, it is the hard-pressed and time-consuming nature of the mother's activities (e.g. combining household and income-earning activities) that are significant determinants of the types of food eaten, the ways in which they are prepared and the amount of emotional support and response that is given to the needs of young children. All these aspects of daily life affect nutritional status, and in very poor societies they are crucially important in preventing child malnutrition. Therefore, consideration of the woman's role and knowledge, motivation, time and control over resources, including income, is essential. Mothers with education and resources are better able to respond to a child's illnesses and other problems. The subordinate position of women in many

societies may also be an important basic cause of malnutrition. Children and women are among the first victims of poverty and malnutrition in situations where prevailing beliefs legitimize their position of inferiority.

50. Breast-feeding is among the most elementary and consequential of care-giving activities. For the baby, breast-feeding combines access to food, protection against infection and the reception of loving care into a single activity. For the mother, breast-feeding means reinforcing the bond with her baby and, in cases where the baby receives no fluid or food other than breast milk, it helps to protect the mother from another pregnancy in the first six months after birth. Increasing the interval between births in turn protects the mother's health and nutritional status and that of other family members.

THE ROLES OF WOMEN IN NUTRITION

There are numerous ways in which women contribute to and, in fact, determine the nutritional status of all household members. While these contributions are significant across the developing world, they are particularly crucial in rural and impoverished families and in the households that are headed by females.

A major way in which women contribute to nutrition is in their role as agricultural labourers. Women frequently contribute more than 50 percent of the labour applied to cash-crop production and perform as much as 80 percent of the work of producing food crops for domestic consumption. They also supply most of the labour for maintaining kitchen gardens that provide families with supplementary vegetables, tubers and fruits, as well as small animals.

Women have a predominant role in post-harvest activities such as marketing, processing (in homes and factories), street vending and storage. They are also normally responsible for selecting food for household consumption, purchasing food and food preparation.

Women contribute to nutrition through the income they generate. Approximately 42 percent of the female population over the age of 15 is in the paid labour force and women predominate in the informal economic sector. Thus, women contribute a significant proportion of the family income needed for food purchases and nutritional sustainability.

Women influence nutrition through their food habits. They are the repositories of food and nutrition information, which may range from knowing edible non-wood forest products to cooking skills. They are primarily responsible for feeding children, teaching children about nutrition, establishing eating patterns and instructing children in cultural norms related to foods.

Women influence nutrition through the health care they give and receive. Women often assist others in taking responsibility for maternal and child health, including pregnancy monitoring, education about nutrition during pregnancy, provision of food and nutrient supplements, health education, birth attendance, protection of breast-feeding, prevention and control of common diseases and household sanitation.

By providing fuel and potable water, women contribute to nutrition. In most of the developing world, women are responsible for the collection and use of fuel resources and potable water for domestic consumption. Both of these items are, of course, important to food preparation, nutritional status and health. In addition, women influence long-term environmental sustainability.

51. The next critical activity-complex is the weaning process, which takes place between six and 24 months. Infants are exposed to the greatest nutritional risks in the form of food contamination, reduced energy density, more infrequent feeding and a loss of maternal security during this time. An elder sibling who is not yet capable of properly caring for an infant may be given this responsibility, which may cause malnutrition or even death. The hard nature of life in poor rural and urban locations may imply that little contact between mother and child takes place after weaning. The knowledge and motivation of the care-giver directly affects the nature of the response to the needs of children. In this context the problems of care for adolescent girls often go unnoticed, yet these girls also constitute a nutritionally vulnerable group in need of care.

52. The education level of mothers alone, independent of household income, is positively related to better nutritional status of children and to lower infant mortality. The effects of maternal education on child health include better management of household resources. Maternal education is frequently associated with greater use of health care services, lower

fertility rates and more child-centered care-giving behaviour. With increasing education, women have more power within the family to allocate resources for food and other items needed for their children's health and welfare.

53. The allocation of food within a home is an important issue directly related to the underlying causes of access to food and care. According to the customs of some societies, particular family members receive more food than others in proportion to their nutritional requirements. For example, research indicates a sex bias favouring males in some countries.

54. A wide range of household and demographic factors are related to child malnutrition, such as the nature of housing and water supply, birth order, the mother's age, age at weaning and the presence or absence of other siblings. Frequent births can deplete a woman's nutritional stores. If nutrient intakes of pregnant women are limited, the foetus' needs are met first. Furthermore, a large number of small children in the home can have negative effects on the children independent of other socio-economic factors.

AT THE COMMUNITY LEVEL

55. The foregoing paragraphs have highlighted the importance of care by individuals and households in determining nutritional well-being. However, communities also have important influences on nutrition. Nutritional status is an outcome of a complex web of social, economic, demographic and environmental factors. Societies have a basic instinct for survival and one of the essential elements of this survival is adequate nutrition. Many communities, especially in developing countries, have to cope with a very harsh physical and economic environment. Their capacity to operate within that environment depends in part on natural resources that may be totally inadequate. For example, for historical reasons a village may have been established on land that is unsuitable for agriculture, highly eroded or exhausted, or located in areas infested with disease agents or vectors. The community's survival depends on its ability to overcome those constraints through its own resources or through the help of the government or other external resources.

56. The economic environment may be equally challenging. For instance, isolated villages may have difficulty competing with villages located in areas that are more accessible to a market and may have to accept a decline in prices for some of their primary produce.

57. A community's ability to cope with such challenges depends on its own structure and organization, the abilities of its leaders and their willingness to cooperate with each other and to serve the interests of the community as a whole. Usually an informal or formal village government, a council or other organization exists. The adequacy of this structure and the encouragement and support given by the nearest outpost of the local government have an important bearing on the community's capacity to cope with its environment and internal problems.

58. Social organization and leadership capacity can also have an important bearing on the nutritional status of the community. For instance, active leaders may organize communal activity needed to maintain village roads and bridges. Farmers' groups can facilitate commercial contact with the outside world to allow the marketing of their products and access to government services.

59. If there is sufficient nutritional, health or social awareness, the village committee or informal groups — especially women's organizations within the community — can sometimes identify poorly nourished individuals, families with problems, displaced persons and landless or other underprivileged households. In well-organized communities, a local organization takes care of these problems. If there is no existing community organization of this type, the nutritional status of community members, along with other measures of quality of life, are likely to be markedly worse.

SOCIAL SECURITY SYSTEMS

60. In addition to the types of care given by communities, there are mechanisms for providing care in a more systematic manner. For example, governments or NGOs provide care through social security systems. Generally, these are organized at the national or local government level and they are more common in urban areas.

61. The provision of care in the form of a socially organized response to nutritional needs is in transition. As communities modernize and populations relocate to urban areas, traditional caring structures within families and communities weaken. This is especially true of the extended family system and this can lead to the creation of groups of people who lack care unless governments or other institutions step in to assist them. In many countries voluntary organizations work to fill the gaps in the provision of care. The state provides social security to maintain minimum income levels in several developed countries.

62. The forms of social security vary in their relationship to nutrition in developed and developing countries. Several developing countries subsidize consumer food prices, especially for urban populations, which helps increase the calorie intake by the poor. In some countries, feeding programmes have been instituted for mothers, infants and schoolchildren. There are some forms of social security (for instance, medical insurance, disability insurance and unemployment payments) in some developing countries, but these

REFUGEES: AMONG THE MOST VULNERABLE PEOPLE

Historically, migrants, perhaps the world's poorest people, have been driven by economic need to move both within a country and across national borders where there is a demand for labour. Increasingly, political refugees, drought victims and others fleeing environmental hazards and internal or international upheavals contribute to migration patterns. The number of migrants represents only a small fraction of the world's population, yet they may have an important influence on the use of resources, including food supplies and health care services. The total number of refugees dependent upon international assistance has increased rapidly over the past two decades. The Office of the United Nations High Commissioner for Refugees (UNHCR) estimated that there were 2.5 million refugees at the end of 1970 while there were 8.2 million ten years later. By 1992, the total number of assisted refugees rose to an estimated number of 19.5 million. Of these, 6 million reside in refugee camps in Africa and 8 million are located in the Near East, North Africa and Southwest Asia. The number of refugees in North America and Europe rose from approximately 2 million in 1991 to 3.5 million in 1992 owing to ethnic conflicts in eastern Europe, particularly Yugoslavia. The remaining refugees are found in Latin America, Asia and Oceania. Solving the problems of refugees has become increasingly difficult. As a result, more refugees remain for longer periods of time in conditions of at least partial food aid dependency.

High levels of acute protein-energy malnutrition have been observed particularly in refugee populations in Africa during the past decade. The immediate reasons for this vary. In a number of emergencies, refugees are already malnourished when they find asylum. Sometimes this is the result of food shortages before flight, whether caused by natural or political factors or, as in the Horn of Africa, a combination of both. Food shortages are often a contributory factor in the decision to flee. On other occasions, malnutrition upon arrival at a refugee camp is the result of food shortages during flight. The majority of refugees flee their homes on foot and many spend weeks *en route* without enough food. Refugees who arrive malnourished at the early stages of an emergency face acute problems, as the mechanisms to respond to their needs have not been established. Where a full ration is not available initially, the nutritional status of refugees who were relatively well-nourished on arrival will inevitably deteriorate. Health risks as a result of overcrowding, inadequate shelter and water supply and other public health hazards are generally greatest in the initial stages. Thus, deterioration in nutritional status can be rapid, with swift increases in morbidity and mortality.

The prevalence of acute malnutrition rose as high as 50 percent among Ethiopian refugees in eastern Sudan in 1985, following their flight from famine and civil war. Malnutrition rates remained at high levels until eight months after their arrival, when effective relief rations and health care were organized. Comparatively high rates of acute malnutrition (45 percent) were also observed among southern Sudanese

are scarce and limited to the formal employment sector. Most developing countries do not have the resources to institute a formal social security system until they reach middle-income levels. In both developed and developing countries, the elderly tend to be socially isolated. In some countries, programmes such as food commodity and meal distribution provide care to these vulnerable groups. In similar ways, programmes for other groups such as the disabled may also be regarded as forms of care. Moreover, when refugees cross international borders, international agencies have an obligation to protect their welfare, and the resources they provide in the form of food and other goods become part of a caring strategy.

refugees in western Ethiopia in 1990, owing to constraints in the timely provision of adequate food rations, water, sanitation and health services. Among Somali refugees in eastern Ethiopia, nutritional status actually deteriorated during the first six months after arriving in their host country (1988/89). The average daily energy content of food rations distributed from February to May 1989 consisted of 1 463 kcal per person compared with the recommended minimum of 1 900 kcal per person per day. Lack of adequate food was exacerbated by overcrowding, an acute lack of water and poor sanitation, resulting in high levels of communicable disease and mortality.

Similarly high levels of malnutrition have been observed among Somali refugees in northern Kenya and in Djibouti during 1991 and the first half of 1992. The response mechanism to such situations has been the establishment of selective feeding programmes for the rehabilitation of the malnourished as well as for prevention. Although nutritional rehabilitation through selective feeding programmes may be effective, these programmes depend on, and cannot substitute for, the provision of an appropriate general ration to all refugees.

There have been situations in which rates of undernutrition remained low or decreased rapidly, such as those in Thailand (1979) and Pakistan (1980). In these cases, emergency relief operations were organized promptly and effective food and health care delivery systems were established in time to prevent health and nutritional problems in the longer term. More recently, widespread malnutrition was avoided in Guinea, West Africa, when in 1990 Liberian refugees were helped by the generosity of Guinean villagers in the absence of immediate international assistance.

The prevalence of acute malnutrition has been low among Mozambican refugees in Malawi, however, the quality of the food rations has not been sufficient enough to avoid several large-scale outbreaks of pellagra (1989/90). Scurvy has been a recurrent problem in the refugee camps in the Horn of Africa, such as in Ethiopia, Somalia and the Sudan, where food rations were confined to two or three items and the vitamin C content was far below the daily allowance as recommended by FAO/WHO. The lack of variety in basic relief rations is a significant risk factor for micronutrient deficiencies such as pellagra and scurvy. The risk is greatest in situations of prolonged and total dependency on external food aid. The readiness of the host government to integrate services, promote self-sufficiency and provide access to employment opportunities where they exist is important in reducing the vulnerability of refugees.

An important policy issue arises when the government of the host country is not in a position to take responsibility for the immigrants and international organizations lack resources to cater to their needs. Only the development of international policies, arrangements and resources can cope with these tragic situations.

Source: UNHCR

Bibliography for Chapter 2

- Abdullah, M. & Wheeler, E.** 1985. Seasonal variations and the intra-household distribution of food in a Bangladeshi village. *Amer. J. Clin. Nutr.*, 41: 1305-13.
- Alderman, H.** 1990. *Nutritional status in Ghana and its determinants, social dimensions of adjustment in sub-Saharan Africa*. Working paper no. 5. Washington, DC, World Bank.
- Behrmann, J.R., Deolalikar, A.B. & Wolfe, B.L.** 1988. Nutrients: impacts and determinants. *World Bank Econ. Rev.*, 2(3): 299-320.
- Berg, A.** 1981. *Malnourished people: a policy view*. Washington, DC, World Bank.
- Chambers, R., Longhurst, R. & Pacey, A., eds.** 1981. *Seasonal dimensions to rural poverty*. London, Frances Pinter.
- Chen, L.** 1983. Interaction of diarrhoea and malnutrition. In L.C. Chen & N. Scrimshaw, eds. *Diarrhoea and malnutrition: interaction, mechanisms and interventions*, p. 3-19. New York, Plenum Press.
- Chen, L., Huq E. & Huffman, S.** 1981. A prospective study of the risk of diarrhoeal diseases according to the nutritional status of children. *Amer. J. Epidemiol.*, 114: 284.
- Haaga, J.G & Mason, J.B.** 1987. Food distribution within the family: evidence and implications for research and programmes. *Food Policy*, 12(2): 146-160.
- Heller, P. & Drake, W.** 1979. Malnutrition, child morbidity and the family decision process. *J. Dev. Econ.*, 6: 203-235.
- Hornik, R.** 1985. *Nutrition education*. ACC/SCN State-of-the-art review. Nutrition policy discussion paper no. 1. Geneva.
- Kielmann A. et al.** 1983. Child and maternal health services in rural India: the narangwal experiment. *Integrated nutrition and health care*, vol. 1. Baltimore, MD, Johns Hopkins Press.
- Lipton, M.** 1983. *Poverty, undernutrition and hunger*. World Bank staff working paper no. 597. Washington, DC.
- Longhurst, R.** 1984. *The energy trap: work, nutrition and child malnutrition in northern Nigeria*. Cornell international nutrition monograph series no. 13. Ithaca, NY.
- Martorell, R., Leslie, J. & Moock, P.** 1984. Characteristics and determinants of child nutritional status in Nepal. *Amer. J. Clin. Nutr.*, 39: 74-86.
- Mata, L.J.** 1978. *The children of Santa María Cauqué: a prospective field study of health and growth*. The MIT Press international nutrition policy series no. 2. Cambridge, MA.
- Rowland, M. et al.** 1977. A quantitative study into the role of infection in determining nutritional status in Gambian village children. *Brit. J. Nutr.*, 37: 441-450.
- Rowland, M., Rowland, S. & Cole, T.** 1988. Impact of infection on the growth of children for 0 to 2 years in an urban West African community. *Amer. J. Clin. Nutr.*, 47: 134-138.
- Sahn, D.E., ed.** 1989. *Seasonal variability in Third World agriculture: the consequences for food security*. Baltimore, MD, Johns Hopkins Press.
- Sahn, D.** 1990. *Malnutrition in Côte d'Ivoire: social dimensions of adjustment in sub-saharan Africa*. Working paper no. 3. Washington, DC, World Bank.
- Scrimshaw, N., Taylor C. & Gordon J.** 1968. *Interaction of nutrition and infection*. Geneva, WHO.
- Tomkins, A.** 1981. Nutritional status and severity of diarrhoea among preschool children in rural Nigeria. *Lancet*, 1: 860-862.
- Tomkins, A. & Watson, F.** 1989. *Malnutrition and infection: a review*. ACC/SCN State-of-the-art series. Nutrition policy discussion paper no. 5. Geneva.
- Wolfe, B. & Behrman, J.** 1982. Determinants of child nutrition, health, and nutrition in a developing country. *J. Devel. Econ.*, 11:165-193.

Chapter 3

Development policies and nutrition

1. The linkages between development policies and nutritional well-being are wide-ranging. The basic causes of undernutrition problems and their solutions often lie outside the field of nutrition. In many instances the most effective government strategies to reduce the incidence and prevalence of malnutrition on a national scale have been those that focus on national income growth with equity rather than those that target malnutrition specifically.

2. In spite of these linkages, national planners and policy-makers have often failed to give adequate attention to the implications of development policies on nutrition. As a result, such policies have not achieved the maximum nutritional benefits possible. In some cases broad policies have had a negative impact on nutritional well-being. For example, the pursuit of industrialization at the expense of the agriculture sector has contributed to nutritional problems in some instances. Macro-economic policies that attempt to correct imbalances between aggregate supply and demand but fail to pay adequate attention to social and nutrition implications can lead to serious nutrition problems, particularly for poor and vulnerable households. While improvements in nutrition may not be among the prime objectives of sector or subsector development policies, identification of their potential impacts on nutrition should be given particular attention by policy-makers.

3. At the same time, from the perspective of targeted interventions addressing specific constraints to nutritional well-being, there is the need to design and analyse such programmes in a broader policy context. A programme to improve food, health or care may be successful, but it may fail to show a measurable impact on nutritional well-being if overall development policies are not designed to produce positive effects on nutrition.

EFFECTS OF DEVELOPMENT POLICIES ON NUTRITION

4. In this chapter, the nutritional impact of the following types of policies are examined: economic growth and macro-economic, agricultural, health, environmental and population policies, as well as urbanization and those policies concerning the international economic environment.

5. The influence of different policies on nutrition can vary depending on the characteristics of the vulnerable group and the mechanisms through which the impact occurs. This may take place through one or all of the direct factors, namely food, health and care, and through their interaction with one another. Properly implemented developmental policies can increase incomes by generating employment, increasing incomes and/or by influencing prices of goods and services, especially food. For example, many governments subsidize food prices, which often primarily benefits urban consumers. Policies can maintain and/or enhance the productivity of resources, such as land and labour of the vulnerable groups. This might be done through legislation regarding agricultural and environmental policies or through health policies that enhance labour productivity. Policies can also develop and expand such services as agricultural extension services, health clinics, crèches, schools, farm input centres and markets, as well as infrastructure, such as roads, bridges, wells and potable water supplies, which can have beneficial impacts on nutrition.

6. The international economic environment critically influences the development prospects and the resources that a country has for government expenditures in all sectors affecting food, health and care, and it can have a strong influence on nutrition.

Economic growth and macro-economic policies and nutrition

7. Economic growth is usually measured by using Gross National Product (GNP) per caput. However, the GNP measure is criticized because it does not include important characteristics of national income flows that greatly affect how well GNP reflects the level of individuals' welfare within a country. In particular, per caput GNP masks the issue of distribution: the same level of national income produces very different welfare outcomes if it is relatively equitably distributed among the population than if it reaches only some groups. Another measure, namely the human development index, which includes per caput GNP, life expectancy and literacy, has been proposed. However, this measure needs to be further refined and developed.
8. With some exceptions, however, there is a strong and consistent relationship between per caput GNP and welfare indicators. For instance, the mortality rate for children under five years of age declines as per caput GNP rises. Furthermore, this effect is strong for groups with low incomes and weakens as higher levels of income are reached.
9. Income growth can improve living standards, individual welfare and, hence, nutrition in several ways. As real incomes increase, the demand for goods and services grows and more jobs become available, enabling more people to meet their needs for food, health care and safe and sanitary housing. However, specific government policies are needed to ensure that the benefits of growth reach the poor and the vulnerable. When a country has welfare indicators that are much worse than most other countries with similar per caput GNP, it may be considered to have "unaimed" growth. These are countries in which the relatively high national income is quite inequitably distributed and in which government spending in the social sector is relatively low.
10. Conversely, there are countries in which welfare indicators are better than GNP levels would suggest. These countries have made strong commitments to the government provision of basic needs (such as low-cost food and primary health care). Other countries have focused on promoting economic growth with equity with a view to ensuring a more equitable distribution of income as well as higher investments in developing human resources and skills.
11. Without sustained economic growth, the impact of redistribution of incomes and assets tends to be limited in terms of providing continuing long-term improvements in the population's welfare. Therefore, there is a strong case in favour of emphasizing equity together with growth as an integral part of a development strategy. Experiences demonstrate that equity and economic growth are not incompatible but in fact work best when carried out together.
12. Governments have a number of options to ensure that growth occurs with equity so that improvements in nutrition are accomplished. Development strategies can have varying effects on different groups of people: some benefit while others are left out. Of highest importance is to ensure that the real incomes of the poor and the vulnerable groups increase significantly as growth occurs.
13. Macro-economic policies, that is monetary and fiscal policies, exchange rates, wages, prices and foreign trade, present an interesting example of how the nutritional status of different groups of the population may be affected by policy decisions. For example, macro-economic policies can adversely affect nutrition if they discriminate against the food and agriculture sector and rural areas, and the poor and vulnerable groups, or curtail social services, such as health, education, targeted food subsidies, etc. In particular, such adverse effects may arise in many developing countries undergoing structural adjustment

programmes, which often involve removal of food subsidies and cuts in government health services in order to reduce budget deficits and to achieve a balance between aggregate supply and demand in the economy. Nutritional effects may also arise through the impact of structural adjustment programmes on economic growth, employment and income distribution. In most cases, the burden of adjustment falls disproportionately on the poor and the nutritionally vulnerable.

14. The issue is not whether adjustment is needed or not, because in the long run it is the poor and vulnerable who will continue to suffer or even suffer more if macro-economic imbalances continue. But the question is how adjustment programmes can be designed and sequenced and/or be accompanied with "safety net" programmes so that policy actions, while achieving macro-economic balance and economic growth, protect the poor and the vulnerable. Two approaches have generally been adopted, but their common feature is the need to identify the nutritionally vulnerable groups and to address their needs within the process of adjustment. The first approach is socially oriented and is intended specifically to reduce the adverse impacts of adjustment on the poor. This entails selecting less deflationary economic policies in the medium-term, promoting a more equitable resource allocation between productive and social sectors while increasing the efficiency of both, improving the targeting of interventions and subsidies and monitoring the living standards and the health and nutritional status of the poor.

15. The other approach is to set up compensatory programmes designed to help relieve negative effects on the poor when they occur. These typically include supplementary feeding programmes, moderation of price increases or reduction in subsidies, expansion of health care, institution of income-generating programmes and setting up "safety net" programmes. Compensatory programmes tend to be more expensive and often require additional donor support. In most instances of adjustment, focusing attention on the nutritional needs of the poor may lead to considerable policy modifications, which should help protect their welfare.

16. With the introduction of economic stabilization, structural adjustment and economic reforms in many developing countries and in central and eastern European countries, there is a great concern about the impact of such policies on nutrition, especially in view of perceived negative effects on health and nutrition. For example, the central and eastern European countries are going through a process of transformation from a centrally planned economy to a market-oriented one. In most of these countries there has been liberalization of prices, elimination or radical reductions of subsidies and commercialization of credit. Most of these countries, however, entered the process of reform with relatively high levels of food consumption. There have been some reductions in food consumption which could have adverse effects on some vulnerable groups. However, widespread deficiencies have not been seen. Purchases of non-food elements of consumption have also been reduced, and in the country that first started the process, Poland, there is a return towards previous levels of food consumption. There have also been strong short-term pressures to increase food imports. Higher expectations of a greater range of food products will intensify this process as these economies overcome the short-term shocks.

Agricultural policies and nutrition

17. Agricultural policies can have pronounced beneficial effects on nutrition through, for example, their impact on the level and stability of food production at the farm level, the level and stability of income of nutritionally at-risk households, food prices, women's labour demands and time allocation and the nutrient content of foods that are produced. Agricultural development, however, has often been concerned more with raising aggregate production of selected food and non-food commodities than with increasing consumption levels of poor households, generating sustainable livelihoods or contributing to healthy diets. Thus, some social groups may not benefit from an overall increase in agricultural production due to their poverty and consequent lack of access to food or to other constraints. Many examples exist of countries where aggregate food supplies are considered adequate but serious malnutrition persists among the poor and vulnerable groups of the population.

18. As the effects of the agricultural sector on nutrition go far beyond the matters of food production and supply, nutritional considerations can be influential in the design and selection of a variety of agricultural policies and programmes. The ultimate role of the agricultural sector should be seen as sustaining livelihoods and improving nutrition, not simply producing crops and livestock. The implication is that who produces, what they produce, how they produce and where they produce may be as important as how much is produced. Therefore, policies determining access to land and agricultural inputs and security of land tenure are key factors in determining agriculture-nutrition interactions. In some countries, particularly in Africa, land property rights are still based on traditional customs, but with growing population pressures, government policies are having an increasing impact. Land reform may be an essential step to satisfying a country's nutritional needs. How food and other commodities are processed and distributed is also important. The important role of the private sector in helping to meet policy objectives needs to be emphasized.

19. As noted, agricultural policies can have an impact on nutrition through a number of mechanisms other than food production, including employment opportunities and incomes, prices, time constraints, labour demands and energy expenditures, environmental and living conditions, foreign exchange earnings, gender issues and a variety of social factors. From a nutritional perspective the need is to determine who will be affected and to what degree by given agricultural policies and then to try to ensure that the poor and malnourished also benefit and that any negative effects are minimized. Where some adverse impact is unavoidable, mechanisms to protect those who may be harmed by such policies would have to be put in place.

20. The introduction of new agricultural technologies can have both positive and negative impacts on nutrition. While increased mechanization, for example, can result in greater productivity per unit of labour input, and thus greater agricultural output, the net effect could be nutritionally detrimental in some countries if this process leads to a decreased demand for labour and the elimination of agricultural jobs, often those of women. The loss of jobs and incomes of women in particular can have a direct adverse impact on their earnings, which are normally largely devoted to buying food.

21. In many rural areas, the overriding nutritional problems are more closely associated with a shortage of jobs than with a shortage of food. The most pressing need is often for employment creation in rural areas through activities related to agriculture. Increasing off-farm employment, especially in agro-industries in agriculture-based economies, is also crucial for improving nutrition. Careful attention should be paid to the effects of technologies adopted in agro-industries and other rural industries on employment and incomes. For the protection of both on- and off-farm jobs in a situation of labour surplus, care should be taken not to allow macro-economic policies, such as an overvalued

domestic currency, to artificially reduce the domestic cost of imported capital goods and inflate the cost of domestic labour.

22. Nutrition concerns should also underlie other agricultural policy decisions. Traditional food crops are often consumed by the poor and food-insecure in marginal agricultural areas. However, the potential of traditional food crops, such as roots and tubers, pulses and legumes, is often not fully utilized for a variety of reasons, such as problems of storage, transport and processing, cheaper food imports undermining the incentive to produce and market foods and a lack of yield-raising research. Increasing the production of these foods by small producers would directly improve food supplies for nutritionally vulnerable groups. Some of these foods, particularly roots and tubers, serve as staples, but others, including a variety of legumes, oilseeds, vegetables and fruits, serve as primary sources of required oils, vitamins and minerals in the diets of many people. Traditional foods reduce problems related to seasonal fluctuations of food supplies, as they are adapted to their environments and so can fill seasonal food gaps.

23. In addition to the direct benefits on nutritional status, the more extensive production and consumption of traditional foods may result in significant economic benefits as well. At the local level, increasing the utilization of traditional foods could result in increased income for those involved in their production, processing and marketing – many of whom are women. At the national level, stimulating the production, processing and marketing of these foods could also reduce the demand for imported foods.

24. Nevertheless, encouraging production of traditional foods requires the selection and breeding of improved plant varieties that are high-yielding, pest- and disease-resistant and nutritious, as well as the promotion of supportive research and technological innovations in food processing and preparation. A nutrition-focused agricultural policy should direct extension efforts to propagate improved varieties of traditional crops, with the appropriate technical advice on their processing. Such an approach, however, may entail a radical reorientation of research and extension expenditures, which would require conscious policy decisions.

25. The growing of cash crops presents a complex balancing of trade-offs between various and often-conflicting considerations. In addition to increasing foreign exchange earnings when such crops are exported, the production of cash crops can be expected to raise and possibly stabilize household incomes, either directly or through jobs created on or off the farm, which may improve levels of food consumption. Improved production technologies such as the use of improved planting materials and inputs, often adopted for cash crops, may spill over into the food crop sector, raising food production as well. On the other hand, the increases in income will not improve dietary intake if the additional income is not spent on food. Land and labour also may be drawn from the production of food to that of the cash crop. In particular, women's time may be demanded for the cash-earning enterprise, yet women may not benefit from the earnings realized or control how they are spent, although they are typically responsible for household food supplies. Furthermore, prices of food in local markets may rise as a consequence. This may partially or completely offset the higher incomes and be harmful, particularly to those who are not benefiting from the cash crop because they are landless or unemployed. Therefore, if agricultural policy involves the promotion of cash-crop farming or other cash-earning farm enterprises, the likely socio-economic impacts must be carefully assessed and counteracting interventions made where needed.

26. Improvements in post-harvest management can often significantly reduce food losses and increase overall food availability and may lead to lower costs for producers and distributors, as well as to lower prices for consumers. Such losses are estimated to average around 10 percent for food grains, legumes and fish, and 20 percent for starchy staples. The post-harvest operations where major losses are most likely to occur are storage, marketing and food handling in the home. While adequate storage is important in

urban areas where retail food distribution and marketing occur, it is essential in rural areas, particularly among semi-subsistence farming households, which are directly dependent upon stored foods for their food security. In addition, household-level storage practices affect the quality and safety of foods; for example, efficient drying and storing of groundnuts and cereals are necessary to minimize the production of aflatoxins and other mycotoxins.

27. Availability of marketing facilities generally improves nutrition. Families that have food markets within relatively easy reach have steady access to cheaper foods, enjoy greater dietary diversification and, consequently, have better nutritional status than families that do not. Adequate infrastructure – such as roads, bridges and railways – transport and marketing facilities and liberal, non-interventionist domestic trading policies are also essential for food markets to function well. Farmers, fisherfolk and the rural and urban consumers should all be able to reach markets without excessive expenditure of time or money. Indeed, efforts to reduce marketing inefficiencies and transaction costs may be in some cases more cost-effective in increasing food availability than increasing production. Such efforts may be relatively simple to make, for example, liberalizing policies towards transport licences or removing restrictions on movements of food commodities.

Health policies and nutrition

28. Health policies are the set of principles by which governments seek to organize health systems to meet the health needs of the population and to promote their physical, mental and social well-being. Such policies can have a large range of nutritional effects.

29. Primary health care (PHC) is the universally adopted strategy for attaining health for all. This strategy is being carried out to various degrees in different countries through the development of community-based activities, supported by strengthened district health systems and the mobilization and allocation of additional resources. Nutritional activities should be an integral component of PHC. However, in reality, the nutritional aspect of PHC is often very weak. Simple measures, such as the treatment of infections, immunizations, management of diarrhoea and of growth faltering and early malnutrition itself, are often inadequate, especially in the low-income countries where health infrastructures are weak. However, in the majority of countries, it is clear that the peripheral and central health services do contribute significantly to the promotion of nutrition through various services and community-based activities. The present trend is to integrate nutritional activities into ongoing health activities at the local level, including hospitals, health centres and communities, and also to include nutrition in overall rural development activities as planned and managed at the district level.

30. Health policies can affect nutrition through their influence on the socio-cultural environment. The improvement of health implies behavioural change. This is achieved through various processes of social communication including education in health and nutrition, formal education, information-sharing and advocacy. These forms of communication are addressed to the general public, particularly consumers; to patients and groups at risk; to the health and other sectors of government that deal with health and nutrition; to private enterprise, including the food industry, and to NGOs. Appropriate communications lead to a growing awareness of nutritional problems. Depending on the effectiveness of the communication and the capacity of the systems to react, communication can lead to more appropriate behaviour (on the part of individuals) and to measures (on the part of institutions) to alleviate situations of both undernutrition and overnutrition. NGOs can play a key role in implementing health policies.

31. The control of communicable diseases is another major area in which health policies and programmes have an impact. The diminution of infectious diseases greatly contributes to the current trend of nutritional improvement in most developing countries.

32. Health policies are also designed to lead to the improvement of the physical environment, including water supplies, sanitation, food safety and housing. Ensuring that an environment is healthy implies the establishment of appropriate legislation, addressing, for example, the purity of water supplies and the quality of foods. All these measures have nutritional benefits.

33. Health policies can have a significant impact on the demographic situation. Most countries have adopted policies for integrated MCH/family planning programmes aimed at ensuring adequate spacing of pregnancies so that the health of the mother and the infant, including their nutritional status, is safeguarded.

34. An important aspect of health policy is the reduction of disparities in health and nutritional status and inequities in access to health and nutrition services. The report to the World Health Assembly in 1992 (A45/3) outlines progress made towards equity through the adoption of policies, strategies and targets that reduce inequality among certain population groups. These include most rural populations, urban slum dwellers, child-bearing women and some special vulnerable groups such as nomads, migrants, displaced persons, refugees and inhabitants of very remote areas. All these groups are particularly at risk of malnutrition, and directing health policies and programmes to reach them could significantly

protect and promote their nutritional well-being. Considering the relatively poor state of maternal health and the important role of women for family welfare and often food production in many developing countries, strong policies in favour of maternal health services including family planning would have an important bearing on nutrition for the whole family and community.

35. One of the weaknesses of both health systems and their nutritional components is the lack of resources. Structural adjustment measures have had to be adopted by nearly all developing countries, and these have usually resulted in decreasing budgetary allocations to the health sector. While community-based health financing has developed to a considerable extent, as in the case of the Bamako initiative in Africa, the coverage and quality of PHC activities remain far lower than is needed.

36. Inadequate human resources and leadership are other factors limiting the health and nutritional actions that could flow from health policies. Personnel with training in nutrition are only present at the district or subdistrict level in some countries, and often their training is insufficient to enable them to plan and implement measures effectively to alleviate the nutritional problems. The extent to which policies and programmes of human resource development specifically focused on the tasks expected of these personnel have been developed varies greatly. These policies and programmes are important determinants of the health system's capacity to deal with nutritional challenges. The need is for improved capacity to manage nutrition-related action at the district level, and there is a shortage of trainers at higher levels of the health system to undertake this training. Nutrition is best taught with a holistic approach to health promotion through community-based action with intersectoral support. A problem-solving approach, based on analysis of a community's nutritional problems or of those associated with the implementation of measures to improve nutrition, would be a suitable way of dealing with related training and operational research.

37. In the approximately 120 countries that have public health problems of chronic diet-related disorders, health personnel usually lack sufficient training to be able to provide appropriate guidance and leadership, either to individuals or the community at large.

38. While intersectoral action, especially with the agricultural sector, is another generally accepted approach, it is difficult to implement. The coordination necessary to collaborate successfully at various levels, for the alleviation of either undernutrition or overnutrition, is often inadequate.

39. In some countries there is effective cooperation of university departments and local or international NGOs with the health sector in promoting better nutrition. However, most of the time the capacity to generate or sustain such cooperation is weak, even when this is part of health policy.

40. Political commitment is essential in the development of health policy, but it is often insufficient to lead to effective action, given all the constraints. The relative weight and influence of the health sector in the state budget is often quite low and financial resources may be scarce and unequally distributed. Structural adjustment, which greatly emphasizes self-financing and community participation, has led to decreases in funds available for the health sector in many countries. Personnel in peripheral health services often feel that they do not receive sufficient attention from the central level, especially when scarce resources are shifted in favour of more sophisticated urban services. Within the health system, nutrition is often given very low priority with regard to its activities and most nutrition units are given a low position in the hierarchy with insufficient human and financial resources for effective action.

41. In all countries, successful implementation of health policies to improve nutrition requires both political will and adequate human and financial resources. Common constraints to more effective health sector initiatives for nutrition include poorly defined

objectives, undeveloped strategies and inadequate monitoring and evaluation. Strengthening managerial capacity in the health sector, especially as it relates to the design and implementation of nutrition activities at all levels, is a priority.

42. There is a need to incorporate more explicit nutrition objectives into health policies. A review of institutional roles, both at the centre and periphery, and a better definition of necessary decision-making processes and actions (including the relationships with other sectors) would certainly increase the effectiveness of existing health policies related to nutrition.

Environmental policies and nutrition

43. Environmental policies need to address the principal causes of environmental changes affecting health, food and nutrition. The effects of environmental changes are of common concern. Among them are excessive use of chloro-fluorocarbons (CFCs), the widespread use of hazardous chemicals, inefficient combustion of fossil fuels, the accumulation of toxic wastes, the use of inappropriate agricultural production technologies or practices, deforestation and overfishing. Lying behind these is an insufficient awareness among policy-makers of the immediate and long-term costs of natural resource mismanagement, the failure of markets to internalize such costs, the weak definition or collapse of property rights and the lack of access by the poor to adequate resources or alternative employment opportunities.

44. Human health ultimately depends on society's capacity to manage the interaction between human activities and the physical and biological environment in ways that safeguard and promote health but do not threaten the integrity of the natural systems on which the physical and biological environment depends. The physical environment has a major influence on human health not only through its soil, water, air and climate, but also through its interaction with the type and distribution of flora and fauna (the biological environment). The biological environment has a major influence on the food supply and on the reservoirs and transmission mechanisms of many diseases. Environmental factors that impair health include: noxious biological agents (viruses, bacteria, moulds, parasites) and their vectors and reservoirs; physical and chemical agents present in the environment that are independent of human activities and can impair health either by their presence (for example, naturally occurring radionuclides, ultraviolet light) or by their relative deficiency (for instance, iodine, selenium); and noxious physical and chemical agents added to the environment by human activities (for example, nitrogen oxides, polycyclic aromatic hydrocarbons, particulates arising from fossil fuel combustion, gaseous, liquid and solid wastes produced by industry and radioactive wastes). The effects of these agents can be magnified or diminished by human intervention or activity.

45. Population pressures in much of the developing world, together with the daily struggle of the poor to obtain the basic necessities of life, are taking a tremendous toll on the natural resources upon which survival depends. Environmental policies deal with issues such as soil degradation, erosion, deforestation, overgrazing, protection of habitat, soil salination, expansion of urban development and quality of air, water and food. Every year, almost 17 million ha of tropical forest are cut down, mostly by poor farmers in a desperate effort to clear space for crops or pasture or to obtain fuel for cooking and heating. The loss of arable land through soil degradation is almost as widespread and perhaps even more serious from a nutritional perspective. FAO studies show that between 5 and 7 million ha of cultivable land are lost each year, most of them in the developing world. Water- and wind-related soil erosion, increasing soil salinity and flooding, are the main causes of soil degradation. Arid and semi-arid regions are under constant threat of desertification. Current estimates suggest that over 80 percent of the rangelands in Africa and the Near East face a moderate-to-severe risk of turning into non-arable land.

46. Environmental degradation resulting from unsuitable land-use practices is a major cause of food emergencies and jeopardizes the long-term integrity of food supplies. Such practices as unplanned agricultural expansion, reduced fallow periods, overgrazing and excessive use of wood as an energy source (especially near major human settlements in arid and semi-arid areas) contribute to environmental degradation. This occurs indirectly through soil erosion and compaction and changes in water-table and stream flow or directly through decreased availability of food, fuel, fodder and other forest and woodland products. The unchecked expansion of cleared forest land results in combined deforestation and low agricultural output, leading to a decrease in the amount of food naturally produced by forests and accelerated soil erosion and water-base depletion.

47. In recent years, environmental issues have become of increasing concern in most developed countries as a result of growing awareness of the cumulative nature of certain problems, such as food contamination and water pollution, resulting from unsafe and excessively intensive agricultural production methods. The indiscriminate use of agricultural chemicals, including pesticides, herbicides and fungicides, which may have long-term residual action and contaminate feed and food, contributes significantly to environmental pollution and ecological imbalance. The excessive or inappropriate use of mineral fertilizers, particularly nitrate and phosphate salts, contaminates underground water, rivers and lakes, disturbs the delicate balance of the ecosystem and results in the formation of hazardous compounds. These problems are no longer confined to developed countries. Developing countries that are in the process of intensifying their agricultural production systems also increasingly experience them.

48. Environmental degradation that results in dwindling fuelwood stocks – the principal energy source for cooking in most developing countries – has a profound and direct impact on nutritional status. In areas where fuelwood is scarce, food is often inadequately prepared and thus eaten in a partially cooked state. Women in rural areas have to walk long distances to collect fuelwood, which makes additional significant demands on their time and energy. A study in Nepal has shown that the time mothers take to gather firewood is a major determinant of children's nutritional status. The dangers to health and nutritional status of undercooking are immediately apparent in the case of a number of important staple foods – for example cassava – which must be well-cooked to be safe for human consumption, to render them more palatable or digestible and to reduce the risk of infection.

49. Fishery resources are also threatened by adverse environmental conditions, while poor management and conflicts over access to common property result in over-exploitation. In many areas, inland fishing is threatened by population pressures, contamination of rivers and lakes and the diversion of water for use in urban areas, industry and agriculture. Like forests and land, fishery resources are under great pressure in most regions. Overfishing, practised in many parts of the world, is depleting stocks faster than they are replenished, thus compromising this important source of food and employment.

50. Among the constraints to implementing environmental programmes are the long-term character of the problems, inequality in access to land and other natural resources, fragmentation of holdings, the widespread breakdown of traditional systems of resource management under commercial and population pressures and the inappropriate economic signals from government decisions and commercial forces.

51. A number of critical areas for action can be identified. First, there is the need for greater integration of nutrition, health, economic and environmental considerations. The first step is to identify the areas where environmental policy objectives will need to be meshed with the nutrition, health and economic goals. For example, if environmental concerns were to be reconciled with the need to increase the supplies of food and other agricultural commodities to meet growing needs, alternative agricultural systems and technologies would need to be developed and an appropriate balance between both intensification and diversification in the choice of production systems, technologies and practices reached. Also, if the costs of protecting the environment and maintaining the resource base were added to the costs of production, processing and distribution, the impact on food prices and nutrition would need to be weighed carefully. It is also necessary to guard against environmental concerns creating increased pressures for the introduction of new barriers to trade for products perceived to be "unfriendly" to the environment. Other environmental issues such as possible climatic changes due to global warming and loss of genetic resources also need to be addressed in order to avoid adverse impacts on nutrition over the long term.

52. Second, an understanding of household decision-making is an essential precondition for strategy and policy formulation, because, in many instances, it is the rural poor who

determine the outcome of government actions to promote sustainable development through their decisions made about resource allocation, production practices and consumption. The rural poor have to make many hard choices in their daily struggle to survive. The survival strategies they adopt involve many actions that affect environmental resources, such as soil, woody biomass, pastureland and water. Some choices result in sustainable actions – others do not. Frequently, poor people have no option but to over-exploit natural resources in order to survive. Everyday security takes precedence over concern to any great extent about the future. Even meeting immediate food security needs is beyond the reach of many of the rural poor. Consequently, much natural resource degradation arises because the rural poor are forced to employ cultivation and pastoral practices that degrade the environment. Sheer necessity forces them into mining soil nutrients, cultivating steep slopes or overgrazing rangelands in order to feed themselves. The varied household tasks of women should also be analysed to see how women perceive and react to the depletion of natural resources such as fuelwood and water. Environmental policies, therefore, need to address these basic issues by increasing the access by the poor to adequate resources and technologies or alternative opportunities for livelihood.

53. Third, there is a need to develop awareness among individuals, organizations and governments of their roles and responsibilities regarding health and the environment. To achieve health and nutritional objectives, people need to live in an environment that is conducive to healthy physical, mental and social development. The environment in rural areas, especially in tropical climates, favours the proliferation of many biological pathogens, such as those responsible for many forms of diarrhoea, respiratory infection, childhood infections, malaria, intestinal worms, schistosomiasis, trypanosomiasis and onchocerciasis. Moreover, increasing urbanization, especially where financial resources are extremely inadequate, offers many threats to health, from the proliferation of domestic wastes to toxic industrial products. Where financial resources are adequate, buildings and facilities can be designed to minimize some of the hazards, thus greatly reducing the risks of food-borne, water-borne and faecal-borne diseases and many other health problems. Health and food legislation is required to ensure the maintenance of all these aspects of environmental health, and specific mechanisms to ensure implementation and enforce compliance are essential.

54. Fourth, to provide a health-promoting environment for all, it is also necessary to promote lifestyles and patterns of consumption consistent with ecological sustainability. The developed countries will also need to reorient their production and consumption patterns and to continue their search for ways to pursue economic and nutritional goals without the present unacceptably high levels of environmental damage to themselves and other nations.

55. Finally, the key role of research and technology needs to be recognized so that these activities may be directed toward achieving environmental, nutritional, agricultural and health objectives. Particular attention needs to be given to the production systems and needs of small-scale farmers, using both traditional indigenous technologies as well as strategic research. The overall objective should be to create conditions in which it is more profitable to conserve resources than to destroy them. Research and technology should aim at developing sustainable production systems for various types and qualities of land and water resources, such as low- and high-potential agricultural lands, forests and fisheries. In particular, it is necessary to develop sustainable technologies for the vast areas of marginal lands, where a majority of the world's poor and undernourished live and which have been largely neglected by research in the past.

56. In an interdependent world all countries will need to search, individually and collectively, for ways of attaining nutritional and developmental goals without causing irrevocable environmental damage. The costs of achieving this are no doubt high, but the costs of inaction are even higher. It should be also recognized that the resources and technologies needed to attain these objectives are beyond the reach of many developing

countries. International organizations, local communities and NGOs can contribute significantly in this endeavour, but their efforts should take place in the proper overall national and international context. At the national level there is a need for increased awareness and the commitment to act.

57. The international community has a crucial role in supporting national efforts through financial and technical assistance, as well as improving market access and ensuring fair prices. In this context, the decisions and commitments reached at the United Nations Conference on Environment and Development (UNCED) should provide the necessary framework for action at the national and international levels.

Population policies, urbanization and nutrition

58. The implications of population policies on nutrition are significant, particularly in food-deficit countries where rapid population growth continues and where urbanization is increasing. While the overall balance between population and food availability is not the only determinant of nutritional well-being, it does have a major impact. In the simplest terms, more people at either the global, national or household level require more food, more goods and more services. This is a critical issue in many developing countries, especially those where populations are expected to double in the next 20 to 25 years and where there is land pressure. As with environmental issues, addressing population concerns is fundamental if sustainable improvements in nutrition are to be achieved. Successful policies to address population issues will include promoting more equitable economic development and providing better access to health, education and family planning services.

POPULATION DYNAMICS

Differences in rates of population growth will lead to striking changes in some geographical areas in the next century. With the exception of Africa, population growth rates have been reduced from annual increases of 2.1 percent in the late 1960s to approximately 1.7 percent in 1992. This trend is expected to continue; by 2020, the annual average rate of population increase will be approximately 1 percent. Annual population growth rates were higher in the developing world (2.1 percent) than in developed countries (0.6 percent) during the late 1980s. In the least-developed countries, the annual growth rate was 2.8 percent during this same period.

These projections are based on expected trends in birth and death rates. Changes in lifestyles, for example, in reproductive behaviour, may affect demographic patterns. Other factors may also alter population size and age structure in the future. For instance, improvements in the provision of health care may reduce mortality. The current AIDS pandemic will be significant, especially in sub-Saharan Africa where children and young adults are most affected.

Both developed and developing countries have experienced improvements in life expectancies, but sharp disparities between them still exist. The average life expectancy in developed countries is 75.8 years; in developing countries it is 62.8 years. Furthermore, in the least-developed countries of the world, this figure is only 50.7 years.

Changes in age distribution patterns

The ratio of children to adults is substantially higher in the developing countries (59.2/100) than in the developed countries (32.9/100). In the least-developed countries, it reaches as much as 84.7 per 100.

In the developed countries, the proportion of the population over 65 years of age has increased from 12 to 12.8 percent, while in developing countries this percentage changed from 4.2 to 4.5 percent. The actual number of elderly people living in developing countries has risen from 153 million to 182 million, while 145 million elderly people reside in developed countries. By the year 2000, the number of elderly (that is, people over 65 years of age) may reach 250 million in developing countries and 173 million in the developed world.

Increasing population density

Increases in population create higher population densities, particularly in South and Southeast Asia. Between 1985 and 1990, the number of people per square kilometre increased from 47 to 52 in the developing countries and grew from 24 to 28 in the least-developed ones. Population density in the developed countries has remained relatively stable at around 20 persons per square kilometre.

59. Most population policies that address fertility issues aim to lower the level of fertility. Lower overall fertility is obtained through reducing the number of children born to each woman together with increasing the length of the intervals between births in many cases. Both phenomena have a positive effect on the nutritional status of children and mothers. As far as family size is concerned, it has been observed in various surveys that in families of a given income class, children are exposed to greater risks of energy deficiency if they belong to larger families.

60. Maternal nutritional status affects fecundity, which is the physiological ability to bear children, and hence affects fertility. This relationship has been observed in its negative form during famines, when birth rates drop markedly and then rise steeply after famine is over. The negative relationship also appears in less extreme circumstances. Anaemia and iodine deficiency are associated with high rates of foetal loss and perinatal mortality, and chronic undernutrition and vitamin deficiencies have similar effects.

61. Over and above the general interaction of fertility and nutrition, breast-feeding has a special effect. Exclusive breast-feeding for four to six months after birth is important for infant nutrition, but it also delays the return of fertility in the mother and so contributes to longer birth intervals. This is a result of lactation amenorrhoea, whereby breast-feeding depresses the hormone necessary for fertility; it is more effective during exclusive rather than partial breast-feeding. Pregnancy spacing allows continuation of breast-feeding and longer intervals between births are associated with better child nutrition. Maternal health suffers if pregnancies are too close and families are put under great stress for time use and income generation. Pregnancy spacing is also affected by child survival as there are immediate pressures to replace deceased children in some societies.

62. Nutrition, MCH and family planning programmes will be more successful if they are linked and integrated. The effectiveness of breast-feeding as a contraceptive mechanism diminishes over time and should be regarded as complementary to other methods of family planning. These methods should take local breast-feeding patterns and beliefs into account so that other contraceptive measures do not interfere with lactation. However, all too often, breast-feeding and family planning are not considered together.

63. The proportion of the world's population living in urban areas has increased from 39 percent in 1975 to 43 percent in 1990, and it is expected to reach 51 percent by the year 2000. This massive shift of population brings with it substantial implications for nutrition, access to food and preventive health care. Unlike urbanization in rich countries where large populations have been successfully absorbed, urbanization in developing countries has led to severe economic and social stresses, with large numbers of urban poor living in crowded slums with limited access to health care and food.

64. The dynamic process of urban growth means rural producers should meet the increasing demand for agricultural products. It requires food production increases varying between 16 percent in Asia to 24 percent in Africa between 1980 and 2000 if the additional urban population is to be fed from local production. Currently the food needs of urban populations in many countries are being met instead by an increasing dependence on imports often due to the marketing of imported foods at subsidized prices, which undercuts the local products.

65. The resulting socio-economic conditions of urbanization have both positive and negative effects on nutritional status. Some are positive, such as improved dietary intakes resulting from increased availability and variety of foods and better access to health and other social services. Urban diets are more varied than those in rural areas, especially in terms of fat, animal products, iron and vitamin A, although total energy intakes are not necessarily higher. This may be because the surveys were not able to take into account the greater amount of snacking in urban areas. A more likely explanation is that energy expenditure is lower in urban areas so consumption requirements are also lower.

66. Urban food consumption patterns lead to the substitution of staple foods, such as roots, tubers and coarse grains, by other sources of energy, particularly wheat and rice. These changes often lead to rising import bills and sometimes to surpluses of traditional foodstuffs. There is a general trend in the urban diet for complex carbohydrates to be progressively replaced by refined carbohydrates and sugars, and fat. Recent household surveys in Latin America and Africa have confirmed that consumption patterns in urban areas of developing countries show increasing intakes of sugar, alcohol, soft drinks, highly milled cereals and processed foods, but at the same time they have also shown improvements in nutritional and health status, reductions in infant mortality rates and increased longevity. Rapid urban development also places stress on infrastructure and services aimed at protecting food quality, in addition to food production.

67. There is also earlier supplementation and discontinuation of breast-feeding in urban areas. In Asia, breast-feeding is practised less in urban areas than in rural areas, although, where declines have occurred in the two areas, changes in the timing of weaning are similar. In most countries the number of women breast-feeding after six months falls off more sharply in urban areas. Actual reductions in the initiation of breast-feeding in urban areas has only been noted in the Philippines. Differences in breast-feeding patterns in urban and rural situations are marked in Latin America and the Caribbean, while in Africa and the Near East urban and rural breast-feeding patterns are not as pronounced.

68. Urbanization can have other negative effects on nutrition. For example, rapid urban population growth can lead to makeshift housing, inadequate water supplies and the accumulation of human waste and garbage contributing to poor hygiene. Even when these conditions have been brought under control, thereby contributing to reduced morbidity, there has been a notable increase in diet-related health conditions, or non-communicable diseases, which are associated with changing food consumption patterns and more sedentary lifestyles. Not all urban populations have benefited equally from an increased availability of goods and services, and in fact both the absolute and relative numbers of urban poor are increasing in many countries. The result is a shift in the focus of poverty from rural to urban and peri-urban areas in some regions.

69. Particular attention needs to be given to specific groups within the urban population, where situations are more diverse than within the rural population. Although malnutrition is on average rather less frequent in cities, among the urban poor the cases are more severe, particularly in young children.

70. The urban household relies almost entirely on purchases to obtain food and much of this food may be commercially prepared and sold in the street or in markets. This sometimes applies even to infant foods. The urban poor are also more vulnerable to economic factors affecting commercial food markets, as they spend a high proportion of their budget on food and are dependent on wage labour for income. In addition, urban households may lack the social support network available to rural households, particularly to the homeless and female-headed households. Food markets are often placed far from the squatter areas where the poorest live.

71. Population policies sometimes address the problem of rural-urban population distribution, generally with a view to moderating the rate of migration to the cities, thus reducing the pressure on urban infrastructures and services. Such policies are based on various strategies to reduce development gaps between rural and urban areas. However, since these policies are of a long-term nature and in many cases not very effective, it is difficult to find evidence that they have a particular impact on the nutritional status of either rural people or their urban counterparts.

72. On the other hand, food policies can have an impact on urbanization. Attention is devoted to urban populations in formulating food policies. For instance, basic food prices are fixed at low levels and subsidized, food marketing for urban dwellers is promoted and

food prices and quality are better monitored in cities. This results in an additional comparative advantage of urban *vis-à-vis* rural dwelling, providing an additional motivation for rural people to move to the cities. This effect is all the more compelling if food producer prices and therefore farm incomes are kept low.

59. Most population policies that address fertility issues aim to lower the level of fertility. Lower overall fertility is obtained through reducing the number of children born to each woman together with increasing the length of the intervals between births in many cases. Both phenomena have a positive effect on the nutritional status of children and mothers. As far as family size is concerned, it has been observed in various surveys that in families of a given income class, children are exposed to greater risks of energy deficiency if they belong to larger families.

60. Maternal nutritional status affects fecundity, which is the physiological ability to bear children, and hence affects fertility. This relationship has been observed in its negative form during famines, when birth rates drop markedly and then rise steeply after famine is over. The negative relationship also appears in less extreme circumstances. Anaemia and iodine deficiency are associated with high rates of foetal loss and perinatal mortality, and chronic undernutrition and vitamin deficiencies have similar effects.

61. Over and above the general interaction of fertility and nutrition, breast-feeding has a special effect. Exclusive breast-feeding for four to six months after birth is important for infant nutrition, but it also delays the return of fertility in the mother and so contributes to longer birth intervals. This is a result of lactation amenorrhoea, whereby breast-feeding depresses the hormone necessary for fertility; it is more effective during exclusive rather than partial breast-feeding. Pregnancy spacing allows continuation of breast-feeding and longer intervals between births are associated with better child nutrition. Maternal health suffers if pregnancies are too close and families are put under great stress for time use and income generation. Pregnancy spacing is also affected by child survival as there are immediate pressures to replace deceased children in some societies.

62. Nutrition, MCH and family planning programmes will be more successful if they are linked and integrated. The effectiveness of breast-feeding as a contraceptive mechanism diminishes over time and should be regarded as complementary to other methods of family planning. These methods should take local breast-feeding patterns and beliefs into account so that other contraceptive measures do not interfere with lactation. However, all too often, breast-feeding and family planning are not considered together.

63. The proportion of the world's population living in urban areas has increased from 39 percent in 1975 to 43 percent in 1990, and it is expected to reach 51 percent by the year 2000. This massive shift of population brings with it substantial implications for nutrition, access to food and preventive health care. Unlike urbanization in rich countries where large populations have been successfully absorbed, urbanization in developing countries has led to severe economic and social stresses, with large numbers of urban poor living in crowded slums with limited access to health care and food.

64. The dynamic process of urban growth means rural producers should meet the increasing demand for agricultural products. It requires food production increases varying between 16 percent in Asia to 24 percent in Africa between 1980 and 2000 if the additional urban population is to be fed from local production. Currently the food needs of urban populations in many countries are being met instead by an increasing dependence on imports often due to the marketing of imported foods at subsidized prices, which undercuts the local products.

65. The resulting socio-economic conditions of urbanization have both positive and negative effects on nutritional status. Some are positive, such as improved dietary intakes resulting from increased availability and variety of foods and better access to health and other social services. Urban diets are more varied than those in rural areas, especially in terms of fat, animal products, iron and vitamin A, although total energy intakes are not necessarily higher. This may be because the surveys were not able to take into account the greater amount of snacking in urban areas. A more likely explanation is that energy expenditure is lower in urban areas so consumption requirements are also lower.

relate to the gains accruing to food importers through having access to food supplies at low prices, as well as through the availability of food aid. Considering the large structural food deficits of several developing countries, the availability of cheap food in the world market gives them an opportunity to pursue programmes that aim at increasing access to food by the poor and provides some relief to their immediate balance-of-payments problem. However, the impact of industrialized countries' agricultural policies on the long-term solution of developing countries' food problems, either through food self-sufficiency or trade-oriented self-reliance, is generally not positive. Because of the low food prices prevailing in world markets, many developing countries find it attractive to choose to pursue a cheap food policy.

79. For those developing countries that set farm prices in relation to world prices that are unduly low because of protection, the effect is to depress domestic prices below what they would have been otherwise. In those circumstances, the profitability of domestic and foreign investment in agriculture decreases, productive resources are diverted to other less competitive sectors and the adoption of new technologies and the pursuance of measures to improve productivity are delayed. The long-term effect is perpetuation of the food deficit problem and of the dependence on imported food, including food aid.

80. The impact of liberalization of industrialized countries' agricultural policies on the food security of developing countries has been assessed by several recent studies that indicate the possible direction of the impact and the implications of trade liberalization on world food security. Liberalization of industrialized countries' agricultural policies is estimated to raise world market prices and stimulate growth in world trade. Positive effects for developing countries include increases in their overall level of real incomes, improvement in their terms of trade and considerable gains in rural incomes.

81. The benefits to developing countries from liberalization of industrialized countries' agricultural policies would accrue mainly to those countries that are substantial exporters of the commodities in which trade would be liberalized. Also, the potential benefits would depend on the response of the exporting countries to a more open world trading environment. To the extent that developing countries modify their policies to complement the changes in industrialized countries' agricultural policies, their overall benefits would likely be enhanced further.

82. The positive outcome of the Uruguay Round of Multilateral Trade Negotiations, which was launched towards the end of 1986 in pursuit of further liberalization of international trade across all sectors, including agriculture and tropical products, could thus have very important implications for food security and nutrition. Equally, the costs of missing this opportunity for trade liberalization could be very high in terms of the nutritional well-being of millions of poor people.

INTERNATIONAL DEBT

83. The external debt situation of the developing countries remains critical. According to the World Bank, their total outstanding debt, estimated at US\$1 341 billion in 1990, was 6 percent above the previous year's level. In sub-Saharan Africa, the magnitude of the debt in relation to the size of the economy rose significantly in 1990 to represent about 112 percent of the region's GNP. Among the other most adversely affected developing regions, North Africa and the Near East and Latin America and the Caribbean, the ratio of debt to GNP also remained high at 87 percent and 48 percent, respectively.

84. While the overall ratio of debt service to exports of the developing countries (payments on interest and amortization as a share of exports of goods and services) decreased slightly in 1990, the ratio nonetheless remains at a historically high level. For instance, from the beginning of the 1970s to the end of the 1980s it is estimated that debt

services rose from 13.3 percent of export earnings to 23.2 percent for developing countries as a whole, and from 4.7 percent to 25.1 percent in the case of sub-Saharan Africa.

85. It should be noted that the above regional indicators are averages and that the magnitude of the debt problem, and hence the impact on nutrition, differs greatly from country to country. However, in broad terms, whereas up to 1982 there were net transfers of debt-related resources in favour of the developing countries, thereafter a growing net outflow of such resources from the developing countries to their creditors occurred, totalling US\$242 billion in the period 1983 to 1989.

86. During the 1980s, the growth of unmanageable debt-servicing problems was associated with a serious squeeze on the commodity export earnings of many developing countries. Throughout the decade, emphasis was placed on the need for debtor countries to reform their domestic macro-economic policies – indeed, theories regarding the solution of the debt problem revolved predominantly around this theme, coupled with some rescheduling of existing debts. There is no doubt that the ability to service debts depends on domestic policies that generate surpluses, but policies must also allow for satisfactory increases in domestic consumption and stimulate investment, as well as induce the reversal of capital flight.

87. However, the approach in the 1980s to the debt problem largely overlooked the severe external impediments faced by developing countries, some of which were mainly or even entirely outside their control. Such constraints to the generation of sufficient foreign exchange included: the only slight growth, and even stagnancy, of demand for primary commodities in major import markets, for a variety of reasons; the protectionist policies of creditor countries themselves, which constrained market access for certain export commodities of the developing countries and the effects of structural adjustment programmes, which meant, in some cases, that developing countries had to expand exports of products for which international demand was not growing at the same rate. In this situation, the compression of imports of both consumption and capital goods had to play a major role in helping to service external debt.

88. Both domestic restructuring and the generation of sufficient foreign exchange proved to be exceptionally difficult in the 1980s. At the same time, little progress has been made so far in the third element in ensuring successful debt management – namely direct debt reduction. Approaches have, however, changed in the direction of debt reduction as opposed to debt rescheduling, and a number of imaginative plans have been drawn up (and applied to some debtor countries) in the past few years. Several developing countries have benefited from increases in the forgiveness of official development assistance loans, but the overall impact has been small.

EXTERNAL DEVELOPMENT ASSISTANCE

89. While included in the total resource transfers to developing countries cited above, external development assistance may usefully be singled out in the present context for separate assessment for a number of reasons. First, external development assistance can be, and to some extent is, targeted at particular objectives by the donor countries. For instance, in their statement of strategy for such assistance in the 1990s, country ministers of the Organisation for Economic Co-operation and Development (OECD) and heads of multilateral donor institutions included human resource development and poverty alleviation among the priorities for development assistance. Second, targeting of assistance can, and in part does, differentiate between recipient countries as well as between beneficiaries within countries. Examples of such differentiation include the limitation of access to highly concessional resources under the International Development Association (IDA) of the World Bank Group to lower-income countries and the recommended priority in favour of low-income food-deficit countries in their Guidelines and Criteria for Food Aid.

90. Overall, development assistance, besides providing support for general economic and social development, could be a powerful vehicle for attaining particular objectives, including those in the field of nutrition. However, if it is to be so, a number of improvements are needed. First, the overall dimensions of development assistance have remained disappointingly small. In particular, development assistance provided by the OECD countries, currently US\$52 billion a year, represents on average 0.35 percent of their GNP as compared with the internationally adopted target of 0.7 percent of GNP. Second, the allocation of development assistance in pursuit of such objectives as poverty alleviation is not clearly evident so far. In this connection, it has been pointed out that only a quarter of aid goes to the ten countries that together have approximately three-quarters of the world's poorest people. Finally, a number of studies have demonstrated the need for the enhancement of the efficiency and effectiveness of aid and possible ways in which this may be done.

Bibliography for Chapter 3

- ACC/SCN. 1990. *Women and nutrition*. ACC/SCN Symposium report. Nutrition policy discussion paper no. 6.
- ACC/SCN. 1992. Breastfeeding, birth spacing and nutrition. Annual Symposium on Population and Nutrition. *SCN News*. Geneva.
- Chenery, H. *et al.* 1974. *Redistribution with growth*. Oxford, Oxford University Press.
- Cooper Weil D., Alicibusan, A., Wilson, J., Reich, M. & Bradley, D. 1990. The impact of development policies on health: a review of the literature. Geneva, WHO.
- Cornia, G., Jolly, R. & Stewart, F. 1987 and 1988. *Adjustment with a human face. Vol. 1: Protecting the vulnerable and promoting growth. Vol. 2: Country case studies*. Oxford, Clarendon Press.
- Demery, L. & Addison, T. 1987. *The alleviation of poverty under structural adjustment*. Washington, DC, World Bank.
- Dreze, J. & Sen, A. 1989. *Hunger and public action*. Oxford, Clarendon Press.
- FAO. 1988. *Urbanization, food consumption patterns and nutrition*. Committee on Agriculture. Rome, FAO. (COAG/89/5)
- FAO. 1991. *Agricultural issues in structural adjustment programs*. FAO Economic and social development paper no. 66. Rome, FAO.
- Gross, R. & Monteiro, C.A. 1989. Urban nutrition in developing countries: some lessons to learn. *UNU Food Nutr. Bull.*, 11(2):14-20.
- Harpham, T. & Stephens, C. 1991. Urbanization and health in developing countries. *World Health Stat. Quar.*, 44(2): 62-69.
- Hicks, N. & Kubish, A. 1983. *The effects of expenditure reductions in developing countries*. Washington, DC, World Bank.
- Jamal, V., ed. 1988. The African crisis: food security and structural adjustment. *Int. Lab. Rev.*, 127(6).
- Kennedy, E. & Cogill, B. 1987. *Income and nutritional effects of the commercialisation of agriculture in Southwestern Kenya*. Research report no. 63. Washington, DC, IFPRI.
- Maxwell, S., ed. 1988. Cash crops in developing countries. *IDS Bull.*, 19(2).
- Maxwell, S., ed. 1990. Food security in developing countries. *IDS Bull.*, 21(3).
- McGuire, J. & Popkin, B. 1990. *Helping women improve nutrition in the developing world: beating the zero sum game*. World Bank technical paper no. 114. Washington, DC, World Bank.
- Pinstrup-Andersen, P. 1985. Food prices and the poor in developing countries. *Eur. Rev. Agri. Econ.*, 12(78):69-81.
- Pinstrup-Andersen, P. 1987. Macroeconomic adjustment policies and human nutrition: available evidence and research needs. *UNU Food Nutr. Bull.*, 9(1):69-86.
- Pinstrup-Andersen, P., ed. 1988. *Food subsidies in developing countries: costs, benefits and policy options*. Washington, DC, Johns Hopkins Press for IFPRI.
- Popkin, B.M. & Bisgrove, E.Z. 1988. Urbanization and nutrition in low income countries. *UNU Food Nutr. Bull.*, 10(1):3-23.
- Prema, K., Bamji, M.S. & Damodaram, M. 1981. *Nutrition, fertility and mortality: a review*. Rome, FAO.
- Szostak, W.B. & Sekula, W. 1991. Nutritional implications of political and economic changes in Eastern Europe. *Proc. Nutr. Soc.*, 50(3):687-693.
- Traill, B. & Henson, S. 1991. The nutritional implications of changing food systems in Eastern Europe. *Proc. Nutr. Soc.*, 50(3):703-718.
- von Braun, J. & Kennedy, E. 1986. *Commercialisation of subsistence agriculture: income and nutritional effects in developing countries*. Washington, DC, IFPRI.
- von Braun J. & Pandya-Lorch, R. 1991. *Income sources of malnourished people in rural areas: microlevel information and policy implications*. Working papers on commercialisation of agriculture and nutrition no. 5. Washington, DC, IFPRI.
- UNDP. 1991. *Human development report*. New York.
- UNICEF. 1990. *Strategy for improved nutrition of children and women in developing countries*. UNICEF policy review no. 1. New York.
- World Bank. 1986. *Poverty and hunger: issues and options for food security in developing countries: a World Bank policy study*. Washington, DC, World Bank.
- World Bank. 1990. *World development report*. Washington, DC, World Bank.
- WHO/WFP. 1988. *Structural adjustment, health, nutrition and food aid in the African region*.
- WHO. 1992. *Our planet, our health: report of the WHO Commission on Health and Environment*. Geneva.

Chapter 4

**Policies and programmes
to improve nutrition**

1. During the last four decades, impressive gains have been made on average in economic development and social welfare throughout the world. However, these average gains obscure the harsh reality that still exists in many countries and among some groups of people who remain socially and economically outside the mainstream of development with many of their basic needs still not met.

2. There are approximately 50 low-income countries in which per caput GNP is below US\$610 per annum. Undernutrition, particularly among young children and women, is widespread in these countries with high prevalences of wasting, stunting and micronutrient deficiencies. Large numbers of people live in poor remote areas where they are vulnerable to repeated food shortages and environmental and economic stresses. In many of these countries infrastructure is underdeveloped, the private sector is weak and governments are often unable to provide the range and quality of services required to meet the population's needs. While the predominant nutritional problems are those related to undernutrition, some urban population groups are affected by chronic diet-related disorders.

3. There are, however, about 40 high-income countries where diet-related disorders, primarily obesity, cardiovascular diseases, hypertension, adult onset diabetes mellitus and dental caries, are major problems. While food supplies in these countries are adequate and average per caput income is high, there are still some households that suffer from the same types of undernutrition found in lower-income countries. About 80 middle-income countries throughout the world constitute a third group of countries in which serious problems of both undernutrition and overnutrition may be present.

4. Addressing this wide range of problems requires the development of appropriate national and international strategies that reflect the different circumstances. In addition to various nutritional problems and causes, each country has a different capacity in terms of skilled personnel, infrastructure and ongoing policies and programmes to address the causes of malnutrition.

POLICIES AND PROGRAMMES DIRECTED AT NUTRITION

5. This section discusses some priority areas for action and related policies that can have a major impact on nutrition, with a view to highlighting important aspects that planners and policy-makers would need to consider in developing and implementing plans of action to improve nutrition. The policies discussed below are grouped under the following interrelated themes:

- improving household food security;
- protecting the consumer through improved food quality and safety;
- preventing specific micronutrient deficiencies;
- promoting healthy diets and lifestyles;
- preventing and managing infectious diseases;
- caring for the socio-economically deprived and nutritionally vulnerable;
- assessing, analysing and monitoring nutrition situations.

6. Addressing issues under these themes facilitates the development of a common understanding of nutrition problems by various sectors and allows a more focused approach for working towards solutions. Taking a thematic approach to nutrition problems should ensure that each of the many facets of a problem are noted while also allowing each sector or agency to assess how it can best work to improve the situation. These themes were considered in the eight regional meetings held in preparation for the International Conference on Nutrition and the discussion below reflects the main conclusions reached in these meetings.

Improving household food security

7. Household food security depends primarily on the ability of the household to secure enough food to ensure an adequate dietary intake for all of its members at all times for a healthy and active life. There are different forms of household food insecurity requiring different policy responses. Chronic food insecurity refers to households that are perpetually short of food. Seasonal food insecurity results from food shortages and higher prices in the lean period before harvest or from seasonal unemployment. Transitory food insecurity arises from failure of livestock and crop production, loss of employment, import difficulties, human and natural disasters and other adverse circumstances.

8. The root cause of household food insecurity is poverty. Household food insecurity affects a wide cross-section of the population in both rural and urban areas. The vulnerable groups include farmers on marginal lands, landless labourers, temporary workers, small-scale fishermen and forestry workers, pastoralists and the urban poor. Increasing the productivity and incomes of these diverse groups requires a strategy encompassing multiple policy instruments and striking a balance between short-term and long-term benefits.

9. The choice of policies must be attuned to the characteristics of a country's food security problem, the nature of the food-insecure population, resource availability and infrastructural and institutional capabilities. The policies should ensure that all households have the means to secure their food on a sustainable basis.

10. Achieving food security has three dimensions. First, it is necessary to ensure a sufficient food supply both at the national level and at the household level. Second, it is necessary to have a reasonable degree of stability in the supply of food both from one year to the next and throughout the year. Third, and perhaps most critical, is the need to ensure that each household has physical and economic access to food and the ability to produce or procure the food that it needs.

11. The following sections cover some key areas where action may be necessary to achieve household food security.

12. **Overall development strategy and macro-economic policies.** The various development strategies can have strikingly different effects on poverty alleviation and food security. Much can be done to reduce food insecurity through public action even when per caput income is low. It is, however, necessary to create conditions for economic growth with equity so that poverty alleviation and food security programmes remain sustainable in the long run.

13. Striking an optimal balance between macro-economic policy objectives and food security needs presents a difficult choice for many developing countries, as exchange rates, import/export policies, inflation and budget deficits can have significant implications for prices, incomes and employment, especially for the poor. In particular, structural adjustment programmes for promoting economic growth through macro-economic policy changes often include reduction of subsidies for producers and consumers and can adversely affect the food security of the poor in the short term. Structural adjustment programmes should, therefore, aim at minimizing the adverse impact on the food security of the poor. Where some negative effects are unavoidable, appropriate compensatory measures need to be considered to alleviate the hardships.

14. **Accelerating growth in the food and agriculture sector and promoting rural development with special focus on the poor.** Growth in the food and agriculture sector is vital for food security. In addition to ensuring an adequate and stable food supply, this sector provides the livelihood for a majority of the population in most developing countries.

Producer incentives and new technologies that increase production and employment in the food and agriculture sector can alleviate poverty and improve food security.

15. Policies to increase food and agriculture production can have even a greater impact on food security when they increase and stabilize the production and incomes of the poor. Therefore, special productivity-enhancing programmes such as improving access to inputs, credit and other agricultural research and services and to markets through improved infrastructure can be particularly helpful for the small-scale farmers and those living in marginal areas. Programmes for improving access to production factors, increasing skills and providing credit and other inputs can help other food-insecure groups such as the urban poor and fishery and forestry workers. Strengthening local leadership, people's participation and community involvement and empowering women, both as producers and consumers, can be of crucial importance.

16. **Improving access to land and other natural resources.** Agrarian reforms can increase the productivity and incomes of the poor, as the lack of access to land and other natural resources is a major cause of poverty and household food insecurity in many countries. This deprivation is often worsened by environmental degradation and loss of the use of public land and forestry and fishery resources as a result of population pressure and changes in policy. Effective implementation of tenancy reforms, redistribution of land where land distribution is highly inequitable and resettlement in new lands wherever feasible can help to improve access to land and other natural resources.

17. **Giving credit to poor households.** Promoting self-employment through private investment can be a useful instrument for strengthening food security. The credit programmes that have been found to be most successful for this purpose are those that combine small-scale credit with group motivation, technical advice and assistance. Credit programmes aimed at women's groups have been particularly beneficial to food security.

18. **Increasing employment opportunities.** In this key area for action to alleviate rural and urban poverty, the private sector can play a very important role by augmenting employment opportunities in both agriculture and industry. Labour-intensive public works can be an effective instrument in food security strategy. They can be doubly beneficial. In the short run they can increase the incomes of the poor, and in the long run they can increase their income-earning capacity by creating productive assets such as irrigation facilities, roads, etc. Public works programmes can reach the food-insecure population by concentrating on disadvantaged regions where poverty predominates, and they can be self-targeting if properly designed, as in the employment guarantee scheme in Maharashtra, India.

19. **Income transfer schemes.** Food consumption can be raised through income transfer schemes, such as food subsidies. However, such programmes involve considerable strain on the resources of developing countries. Therefore, the effectiveness of generalized food subsidies in achieving food security on a sustained basis is often questioned. Instead, targeted food subsidies, food stamps and targeted feeding programmes that identify vulnerable groups and cater to their needs only are favoured. However, these require an administrative infrastructure that is not feasible at the present time in many developing countries. Alternatives are to introduce self-targeting schemes, i.e. to select for distribution only those foods that are consumed primarily by the poor or to locate food distribution centres in those areas where the poor live.

20. **Stabilization of food supplies.** Policies aimed at stabilizing food supplies often include government stockpiling to meet requirements in periods of crop shortfalls and/or during the period before the harvest. Limited stockpiling, especially in the form of strategic food security reserves as a first line of defence in emergencies, is useful. However, stockpiling is costly and a balance of its cost-benefit is required. An alternative is to rely on trade-oriented policies that enable the country to obtain food supplies from the world markets either on commercial terms or as food aid. In practice an appropriate policy mix

involving some stockpiling and some reliance on world markets would need to be adopted in light of the circumstances of the individual countries.

21. Investments in agriculture are also often needed to improve post-harvest handling, storage, preservation and distribution to reduce losses at all stages. Incentives to promote food processing at the local level and to better utilize and preserve indigenous foods can also contribute to household food security.

22. With regard to fluctuations in food availability and consumption within the season and between seasons, a basic approach would be to increase productive capacity and/or income-earning opportunities of households. Also, development of marketing facilities could help to ensure food supplies throughout the year. A variety of cropping strategies can also help, including greater use of roots and minor crops, crop rotation, mixed cropping, varietal selection, staggered scheduling of planting and harvesting and promotion of household and community gardens. Planting of perennials, such as trees that bear fruits, nuts, edible leaves or shoots, during the off-season of agriculture can also be a useful strategy for alleviating seasonal food shortages.

23. **Improving emergency preparedness planning.** Natural disasters such as droughts, floods, cyclones and earthquakes lead to household food insecurity. Moreover, refugees and displaced persons also face food insecurity. These problems require actions both at the national and international levels. At the national level, there is a need to strengthen the capacity to cope with emergencies and resulting food shortages. Action in four basic areas can help, namely: an effective early warning system; a strategically located and effectively stored food security reserve; a pre-determined contingency plan of action, for example, famine codes; and the enhancement of affected people's entitlements, through public works programmes, for example. Introducing measures that can prevent such disasters, for example, irrigation schemes for drought-prone areas and flood control schemes, can also help.

24. The international community has an important role to play in helping countries prevent and cope with emergencies and in helping meet the needs of the refugees and displaced persons. FAO's Global Information and Early Warning System (GIEWS) provides the international community with regularly updated information on current and projected food availability by country. Efforts are currently under way to enhance the system's capability to monitor changing socio-economic conditions that could affect the food security of vulnerable groups. A strengthened mechanism at the international level, such as the International Emergency Food Reserve (IEFR), could also be of great importance to secure an effective and timely response from the international community in meeting with emergencies. Non-governmental organizations can play a vital role in alleviating household food insecurity, especially in emergency situations, through early warning systems, food and nutrition surveillance schemes, resource mobilization and action-oriented programme implementation.

25. **Food aid.** Food aid can play a very important role in improving household food security during natural and human-caused emergencies. It can also help governments address problems of chronic food insecurity. For example, food aid can provide balance-of-payments support, stabilize food prices, help build food reserves, facilitate public works programmes and create funds for use by government through monetization. To the extent that food aid saves expenditure on food imports, it becomes a grant of foreign exchange. This could permit additional commercial food imports or the importation of agricultural inputs, thereby increasing overall food availability.

26. The increasing monetization of food aid, accepted by donors and recipients, permits the transformation of food into cash, with extra benefits for development and nutrition. Open market sales of food aid commodities lead to lower food prices and therefore provide an implicit subsidy that can improve the nutritional status of vulnerable groups. However,

it is necessary to safeguard against possible disincentive effects on local food production as a result of lower prices due to food aid.

27. *Strengthening the coping mechanisms of households to meet with emergencies.*

Three basic stages can be identified in the pattern of household coping or the failure thereof, namely, loss prevention, crisis damage containment and household collapse. In order to cope with emergencies effectively it is important to understand the coping

FOOD INSECURITY, FAMINE AND COPING MECHANISMS: LESSONS FROM AFRICA

Famine, which gripped the Horn of Africa and the Sahel just a few years ago, still threatens some countries in these regions. In addition, many people in southern Africa are now at risk of severe undernutrition. Food insecurity and famine cannot be separated from the issue of poverty. Many survivors of famine in the Horn of Africa have been left with few assets and an increasingly fragile agricultural income base that offers little protection against future crises. In such circumstances, people are permanently food-insecure and their vulnerability to future crises is exacerbated.

Although the experiences with famine differ in Ethiopia, the Sudan and Burkina Faso, the factors that contribute to famine are quite similar. They include proneness to drought, limited ownership of assets, lack of employment opportunities, low levels of farm technology, poor rural infrastructure and poor environmental health and sanitation. The inability of households to cope with high levels of food insecurity and a lack of preparation by governments can result in famine.

The sequence of events that leads to famine is complex. Although there is a close relationship between drought and food production in Ethiopia and the Sudan, one year of drought in itself does not necessarily cause famine. While it is important to note that famine does not occur suddenly, this does not mean that famines may not be triggered by a single year of drought in the future. Household resources in famine-prone regions have already been seriously depleted, leaving households even more vulnerable than they were previously. This implies that reliance upon indigenous coping mechanisms alone is insufficient and increasing public policy and action for famine prevention and preparedness is necessary.

In the event of impending food shortages, farm households adopt a range of resource management strategies, often referred to as "coping mechanisms", long before famine becomes a threat. Such strategies consist of a sequence of famine survival activities. In a sense these are an extension of daily activities that help people to manage their resources in times of stress. During normal times, households minimize risks in a variety of ways. Farmers practise crop diversification, use drought-resistant varieties of seed, hold savings and investments and store food. Social support networks based on gifts, food sharing and loan provision also help households manage their resources more effectively to withstand stress.

Studies from Ethiopia, the Sudan and Burkina Faso indicate that, as family food stocks became depleted, households responded first by selling livestock, then by selling household goods and jewellery, then by borrowing from relatives and friends and seeking off-farm employment. As the crisis deepened, consumption levels were reduced to one meal or, among better-off households, two meals a day, and there was consumption of bush or "famine foods", such as wild leaves, berries and rodents. The reduction in the frequency of meals had severe consequences on children's nutritional status.

In the final event, in Ethiopia and the Sudan, when all available survival strategies had been exhausted and relief assistance was not delivered on time, the only remaining option was migration to the relief camps to seek food assistance or, in more unfortunate cases, succumbing to disease and death.

To prevent future famines, more comprehensive knowledge of people's ability to cope in food emergencies is needed. Knowledge of responses — especially the ones signalling "unusual stress" — is critical for effective programming of famine relief. Prevention of food insecurity requires knowledge about the people whose food sources are insecure, for instance, we need to know who and where they are and to what extent their households and communities have the capacity to cope.

Labour-intensive public works projects play a vital role in supporting the purchasing power of the poor during times of food shortage, thereby preventing distress migration into camps and cities. The key to long-term food security and famine prevention is the adoption of policies that support such activities as the promotion of agricultural growth through improved agricultural technology, setting up of strategic grain reserves, the establishment of effective early warning systems, an improvement of rural infrastructure and the provision of basic health services and education.

Source: J. von Braun, P. Webb, T. Reardon & T. Teklu. December 1991. Food insecurity, famines, and coping mechanisms: lessons from Ethiopia, Sudan and Burkina Faso. Washington, DC, IFPRI.

behaviour of the households in order to strengthen their capacity to face emergencies. However, it is obviously not enough to allow poor households to rely completely upon such mechanisms since they are not adequate to protect them from the life-threatening impact of emergencies. Moreover, when emergencies occur frequently and in rapid succession, the strength of the coping mechanisms themselves is greatly reduced, thus dangerously exposing the households to the worst effects of adverse situations. Due to a lack of resources, inadequate institutional support and other factors, household coping mechanisms are not always efficient or effective in offsetting the adverse impact of emergencies, whether natural or human-caused. Action is needed on two fronts. First, there is the need to strengthen the capacity of the household to protect itself from the impact of the emergency, for example, through household and community food storage, processing facilities, group savings and credit schemes, diversification of income sources, strengthening of production basis, building of roads and other marketing facilities. Second, there is the need to help the household when the emergency occurs, for example, by supplying seeds for growing short-term crops, by providing livestock feed, water and food aid and by introducing rehabilitation measures to promote recovery from the debilitating impact of the emergency.

Protecting the consumer through improved food quality and safety

28. Strengthening food safety and quality control systems, promoting good manufacturing practices and educating consumers about safe food handling are essential to good nutrition. Governments, the food industry, consumers and international agencies all have important and interrelated roles to play.

29. To ensure that food is safe and that food quality is maintained during production, handling, processing and packaging, an effective food quality control system is necessary. Proper food control measures also help to reduce food losses and to promote a healthy diet as well as the application of appropriate food technologies. In addition, ensuring the quality and safety of foods can stimulate world trade in food products and result in the creation of jobs, an increase in incomes and, ultimately, an improvement in nutritional status.

30. Governments have a responsibility to promote the availability of a nutritious and varied food supply and to ensure its quality and safety so that the public can choose a healthy diet. This requires comprehensive legislation, regulations and standards, together with the organization of effective compliance and monitoring programmes, including inspection and laboratory analyses. However, given the limitations in resources for inspection and compliance monitoring, each country will need to decide its priorities in the protection of public health and ensuring fair trade. For this purpose, national surveillance of food-borne diseases and monitoring of contaminants as well as of available resources is essential. Therefore, governments should regularly collect and analyse the information on the quality and safety of the food supply. When problems are detected or suspected, special surveys and surveillance of diseases should be encouraged.

31. Governments have a role in educating the consumer and advising the food industry about a variety of food quality and safety issues, including good agricultural and manufacturing practices, food-handling practices, measures to minimize food spoilage and actions to avoid contamination. Both industry and consumers need to be made aware of food laws, regulations and standards. Education programmes should be directed toward certain target groups, including the economically disadvantaged, people who have recently migrated to urban areas, women as the primary care-givers in the household, individuals with special nutritional needs, food handlers particularly street food vendors, farmers, industry supervisors, educators and health professionals. Governments may also need to establish food and nutrition labelling regulations as well as guidelines for advertising to help consumers make better-informed decisions.

32. It is a special responsibility of governments to see that the food quality and safety concept is integrated into other government-sponsored nutrition-related programmes, such as feeding programmes, nutrition education programmes, primary health care in particular, and other intervention programmes. International-agency assistance programmes in these areas are critical in developing countries. As part of general health and nutrition education efforts, educational curricula need to include the importance of careful handling of food to avoid contamination. Governments can bolster better understanding of issues related to food quality and safety by conducting research in public health and in food technology.

33. Few low-income countries have the institutional structure to implement comprehensive food quality programmes, although there is an important need to start to build capacity. Since the priority in many low-income countries is to increase access to food, the importance of food quality and safety in contributing to better access at both the household and national levels needs to be emphasized. Countries that already have legislation and

FOOD TRADE AND CHOLERA EPIDEMIC IN THE AMERICAS

Export markets for primary, semi- and highly manufactured products are essential contributors to the economic growth of the Latin American and Caribbean region, representing an important source of foreign currency. Agricultural, fisheries and forestry exports accounted for 31 percent of all exports in 1989, with a total value of US\$38 000 million. In 1988, the food exports represented 13.1 percent of the total exports for Brazil, 13.4 percent in the case of Chile, 40.3 percent for Ecuador, 9.1 percent for Mexico and 32.6 percent for Uruguay. In 1989, exports of fish and fish products from Latin America reached a value of \$3 405 million, with Chile, Mexico, Peru and Ecuador as main exporters (\$861 million, \$484 million, \$437 million, \$437 million, respectively).

The cholera epidemic, which was first reported in Peru at the beginning of 1991, has had a dramatic effect on domestic and import/export food trade. The epidemic continues to spread to other countries in Latin America and the Caribbean and has caused devastating loss of human life. At the beginning of the outbreak, as various foods were associated with the transmission of cholera, alarm was created in the affected countries and in those countries importing foods from Latin America.

The high potential for cholera contamination of fresh and frozen seafood, and to a lesser extent of fruits and vegetables that have been water-processed, has resulted in the tightening of food control and quarantine procedures by those countries that import foods from Latin America. Serious negative effects on trade and on the economies of many of the countries of Latin America, particularly Peru, have occurred. Domestic trade was also affected in several Latin American countries because of the anxiety created among consumers over the safety of the food supply. Street foods were identified as being possible major vehicles for the transmission of cholera in Peru. Measures were taken to improve the handling and preparation of the foods sold and, in some cases, the sale of street foods was restricted. Products such as fish and vegetables were incriminated in the transmission of the illnesses and their consumption was drastically reduced. Even following measures taken by governments, it was some time before consumption recovered.

Resource-poor groups suffer from major income losses resulting from decreases in trade. Small producers, for example, may continue consuming the food they produce themselves but may be unable to sell it at prices that enable them to cover their other basic needs, including other food items, leading to modifications in their diet. Although measures were taken to improve the handling and preparation of foods sold, in some cases the sale of street foods was restricted, thereby affecting a significant part of the population whose income depended on the sale of those products.

Available information on economic losses caused by the cholera epidemic is still scarce and not complete. Figures reported by Peru, however, estimated the loss to include approximately \$5 000 million by 1991 in the fisheries industry. A direct loss of \$13 000 million has been reported by the Peruvian Exports Association.

Source: FAO/PAHO/WHO Joint Technical Consultation on Food Safety and Trade in View of the Cholera Epidemic in the Americas, FAO's Food Control Programme For the Prevention and Control of Cholera in the Americas, Buenos Aires, Argentina, 6-8 April 1992.

enforcement mechanisms, including inspection and laboratory services, could assist other countries in this area in the spirit of Technical Cooperation between Developing Countries (TCDC). However, most low-income countries will need to rely on international agencies for assistance in developing the infrastructure that is needed to ensure adequate food control.

34. In many middle-income countries undergoing a transition from a predominantly rural and agriculture-based society to an urban and commercialized one, food control procedures need to be strengthened to meet basic standards of hygiene in food preparation. Infrastructure to provide adequate water and basic sanitation is needed to ensure the quality and safety of food at both the household and commercial levels.

35. The role of industry in ensuring food quality and safety extends from agricultural production through to food services. Good agricultural practices include proper pre-harvest use of pesticides, fertilizers and veterinary drugs, post-harvest control of storage, chemical use and handling practices, and transport. The food industry also has a role to play in

developing alternative cost-effective technologies for maintaining food quality and safety, applying modern approaches to quality assurance (e.g. Hazard Analysis Critical Control Points) and training managers and food handlers.

36. International organizations can play a very important role in providing advice and expert technical assistance to governments on food quality and safety, including the safe use of food additives and their permitted levels in various foods, and on the recommended maximum levels of different contaminants in food. On a global basis, international organizations will need to continue assessing the magnitude of food contamination and its effects on health by monitoring the levels of selected contaminants in food and the incidence and prevalence of food-borne disease at regional and global levels.

37. In addition, international organizations have a unique role to play in advising member countries with regard to developing legislation and regulations, including standards and guidelines for food quality, safety and labelling, such as those developed by the Codex Alimentarius Commission (Codex), a subsidiary body of FAO and WHO. These international standards protect the health of consumers while ensuring fair trade practices. Food standards are important in promoting international and national trade of food products. Standards and codes of practice have to be an integral part of national and international food security systems for ensuring the safety of food.

Preventing specific micronutrient deficiencies

38. Three goals of the Plan of Action adopted by the World Summit on Children and embraced by several international agencies envisage the virtual elimination of iodine and vitamin A deficiencies and the substantial reduction of iron deficiency within this decade. These represent attainable goals if concerted efforts are made as soon as possible. Overcoming micronutrient deficiencies is one area in which technologies are known and affordable and the objectives are the most readily attainable. This is a unique challenge and opportunity for nutritional science and technology, as well as governments, the private sector and communities, to join forces.

39. The basic requirement for different countries is the formulation and implementation of national plans of action with defined strategies and activities to tackle micronutrient deficiencies. To date, most countries that have dealt with various micronutrient problems have tackled each of them separately. Evaluations indicate that for each micronutrient, the programmes that have been implemented have often achieved poor coverage of the population at risk. Only a few countries have developed integrated, complementary and sustainable programmes.

40. Because the strategies involved are so different and often involve quite different actors, a separate plan of action will be required for each of the micronutrient deficiencies. However, they may also be linked together under one "umbrella plan". One of the first requirements in most countries is a more detailed assessment of the common micronutrient deficiencies. Some local or regional surveys have been done in most countries, but these are often outdated. In addition, the situation is constantly changing as a result of programme implementation, in which case, periodic reassessments are required, at least every five years. Such assessments may be on a national scale (e.g. to identify affected areas) or concentrated in areas thought to be affected. Preferably, such assessments should be done on a district-by-district basis, while limiting costs as much as possible. In part, this can be done by combining micronutrient assessments with other nutritional surveys, keeping in mind the specificity of micronutrient survey requirements. The immediate and underlying causes of the deficiencies should be determined in each case with some reporting back to the affected populations. Adequate baseline information, not only on health aspects but also on the food, socio-cultural and economic factors, is necessary to plan, implement or evaluate micronutrient-deficiency control programmes in a more cost-effective manner.

41. Basically, there are four main strategies of intervention, which are outlined below.

42. **Improving dietary diversity.** This can be done, for instance, by stimulating the production and consumption of micronutrient-rich foods, especially green leafy vegetables, and fruits, which are rich sources of vitamin A, iron and other micronutrients. This strategy is generally the most fundamental and sustainable one, at least for vitamin A and iron deficiencies. For iodine deficiency, seafoods are a good food source and consumption of goitrogenic foods should be reduced as much as possible.

43. Preventing micronutrient deficiencies by encouraging consumption of a varied diet is usually considered to be a long-term approach. However, recent experience has demonstrated that even in a relatively short time (for example, through promoting local production and consumption of particular vegetables) significant modifications of dietary habits can be achieved. In rural and even in urban areas, there is great scope for home production on small landholdings to improve direct household supplies of micronutrient-rich foods. At the national level, food and agricultural planning can play a positive role in increasing the availability of micronutrient-rich foods. Intensive education and

communication are necessary to achieve the required understanding, motivation and popular participation. The dietary approach is a crucial component of community-based strategies for household food security. The food-based strategy is the only sustainable solution to the permanent elimination of micronutrient malnutrition.

44. **Food fortification.** This involves adding iodine to salt (or other common foods), adding vitamin A to fats or oils, sugar, salt, etc., or adding iron to wheat, rice or salt. Monosodium glutamate, milk preparations and weaning foods of various types have also been successfully fortified with various micronutrients, especially in industrialized countries. The net result of fortification programmes in these countries has been the elimination or near disappearance of many of the micronutrient deficiencies, although iodine and iron deficiencies are still widespread in Europe at lower levels of prevalence.

45. The chief problems with fortification in developing countries are the cost and the means of implementation. Fortification of salt for instance usually requires the cooperation of the private sector. It is difficult where there are multiple small-scale producers and where there are problems in writing, adopting and enforcing appropriate legislation. It is imperative to ensure the development of national capabilities to implement and manage these interventions and to communicate with the public on a massive scale. The active cooperation of the salt or food producers and traders, as well as the motivation of consumers and communities, is vital. While fortification is technically easy in industrialized countries, in developing countries the distribution of most commodities that could be fortified is limited. Salt is almost the only feasible vehicle since it is universally consumed.

46. **Supplementation.** This can be carried out, for instance, with iodized oil (given orally or by injection), vitamin A (given in high-dose capsules or oral dispensers) and medicinal iron. Supplementation is usually seen as a short-term measure to be used while longer-term programmes are being developed. For example, it is used as an emergency action for displaced populations or as a temporary intervention until long-term measures can be implemented. Even short-term interventions, implemented on a broad scale, may take a year or two to organize. Iron supplements are widely given in a majority of countries through maternal and child health services (MCH) and local health services and sometimes through primary health care (PHC) programmes at the community level. For the most part, however, the implementation is not systematic and coverage is poor. Much could be done to improve the supply of tablets, coverage of communities, training of health staff and adherence to the programme. Delivery channels for these supplements are already in place, for example, MCH and immunization programmes, various PHC outlets, school systems, extension services and NGOs all provide iron supplements. However, it must be recognized that often the key target groups (e.g. pregnant women, pre-school age or school-age children) are not the same for each micronutrient and there are many operational constraints to complete integration with other health services.

47. **Public health measures.** There are various public health measures to be supported, such as legislation (including food quality and safety control systems for fortification programmes), measures addressing critical environmental factors (water, sanitation and food hygiene), immunization programmes, control of endemic diseases, MCH/PHC and health education and information. Promotion of breast-feeding and improving maternal nutrition are also of critical importance.

48. While some of these interventions have to be specific, e.g. salt iodization, most of them need to be pursued in the larger context of PHC and overall development strategies at all levels, from the household and community up to the district and national levels. Close association with measures for infection control, MCH/family planning services, including breast-feeding promotion, and measures for ensuring food safety are imperative to achieve optimum benefits.

49. Common action for two or more micronutrients is feasible. It can reduce costs, reinforce primary health care systems and maximize human resources. Such common action can include the following approaches.

- For vitamin A and iron, dietary improvement can easily be achieved since many foods are rich in both of these (and other) micronutrients. Moreover, the micronutrient status of young children can often be improved by more equitable distribution of foods within the family.
- Double or even triple fortification, e.g. of salt with iodine and iron, is technically feasible but still at an experimental stage and more research is needed to reduce the costs of this method. Multiple fortification of foods such as milk or cereal/legume mixtures in food aid programmes should be feasible.
- Combined supplementation programmes, integrated in existing health programmes as indicated above, offer excellent opportunities for rapid and cost-effective action. Operational research along these lines is desirable.
- Social communications with emphasis on nutrition education for the population worldwide are necessary to support all these programmes. They need to be greatly intensified and will be most cost-effective if all three micronutrient-control programmes are dealt with jointly.
- Common leadership and management mechanisms are also feasible in many countries and could help to mobilize the necessary resources — human, material and financial — both within the country and from outside.
- Simultaneous assessments (baseline or periodic) of micronutrient status can provide another area for common action. However, these are complicated by the fact that the preferred age groups for surveys are different for the three micronutrients. Further research is required to overcome this constraint.

Promoting healthy diets and lifestyles

50. Promoting better eating habits and positive health behaviour is one of the most challenging tasks in the overall effort to improve nutrition. In addition to access to a variety of safe and affordable foods, people need accurate information on what constitutes a healthy diet and how they may best meet their nutritional needs. Besides education, strategies to promote healthy diets must include providing motivation and creating opportunities for people to change behaviour, recognizing individual preferences, lifestyles and often time constraints.

51. There have been a number of national efforts aimed at promoting healthy diets and lifestyles in both developed and developing countries, some of which have been well documented by the WHO Study Group (1990). Reversal of increasing trends in diet-related non-communicable diseases in some developed countries is attributable to these efforts aimed at promoting healthy diets and lifestyles along with improved medical care and health screening. It is expected that such intervention efforts will also contribute to reversing these disease pattern trends in developing countries.

52. The steep increases in diet-related non-communicable diseases in many developing countries reinforce the need to link nutrition concerns with development policies and plans. Promoting healthy diets and lifestyles could involve actions in the following areas: nutrition education and dietary guidance for the public; training of professionals in health care, agricultural extension, etc.; the provision of guidelines for food services; involvement of consumer groups and food industries; ensuring food quality and safety; monitoring and evaluating the food and nutrition situation in the country; and encouraging the availability of the variety of foods needed to meet consumer demand for healthy diets.

53. *Dietary guidelines* have been issued by governments and private organizations in some countries generally following on extensive scientific review of the relationship between diet and health. In addition, scientific bodies have established recommended dietary allowances for the population. Traditionally, recommended dietary allowances have focused on safe and adequate intakes to avoid deficiencies and to cover the needs of nearly all individuals in the population. These allowances have been used widely, to plan and procure food supplies for population subgroups, to establish standards for feeding programmes and to serve as a basis for nutrition labelling.

54. More recently, governments and private organizations have issued dietary guidance reflecting the growing concern about prevention of diet-related non-communicable diseases. Dietary guidance statements for the public provide advice, appropriate to the country's population, about how to select a balanced diet and to encourage related lifestyle behaviours to promote health, including breast-feeding. Increasingly, attention has been given to providing advice on those dietary patterns and lifestyle behaviours associated with increased risk of diet-related non-communicable diseases. Dietary guidelines are most useful if they serve as the basis of and provide the guiding principles for all widely disseminated nutrition education messages given to the public. This will help to ensure that consistent and accurate information is provided to consumers.

55. *Food goals* are often included in dietary guidance statements and are expressed in terms of certain foods or groups of foods to be included in the daily diet. The population's food supply, environment, economic, social and cultural characteristics must be considered when developing food goals and these should be developed appropriately for a particular population.

56. In addition to qualitative dietary guidelines, quantitative nutrient goals have been proposed in some countries. The WHO Study Group (1990) has recommended *population nutrient goals*: the limits within which average nutrient intakes of countries or communities should fall. The group envisaged that population nutrient goals would be general planning

tools, used in relation to the kind, quantity and quality of foods produced, imported or consumed, and as a yardstick to measure the adequacy of response to social communications.

57. *Food and nutrition labelling* can assist the public in selecting a healthy diet. Nutrient content information provided on the food label can support the implementation of dietary guidelines. The FAO/WHO Codex Alimentarius Commission has developed, for consideration by governments, guidelines on nutrition labelling that apply to all pre-packaged foods and foods for catering purposes. Recent attention in some countries has been given to simplifying nutrition labelling by including only those nutrients or dietary components that have public health significance. Consumer surveys in developed countries indicate increased interest in nutrient content of foods and the need for less complicated label formats. Considerable research is currently under way to examine various nutrition label formats so that they may be better understood by consumers. In addition, *health claims* and *descriptors*, such as "low fat" and "reduced calorie", on food labels are specifically regulated in some countries to ensure that food so labelled meets specific criteria.

58. *Education* at all levels also plays a key role in the promotion of healthy diets and lifestyles. Effective approaches to motivate and change behaviours to improve nutrition and encourage healthy lifestyles have been documented. Generally, nutrition education has been found to be effective in changing behaviour when behaviour modification, rather than diffusion of information, was the goal. Successful approaches have incorporated useful strategies borrowed from social learning, social marketing and entertainment-education strategies for mass communication. Programmes that have adopted these approaches have had a positive effect in improving nutritional status among low-income groups and others.

59. The contents and emphasis of the educational messages will vary in rural and urban areas according to differences in lifestyle, culture and access to natural or processed foods. The most effective education and public information channels will also vary since rural people often live in more scattered areas or in small clusters and may have lower literacy levels than the people living in urban centres, especially in developing countries. Thus, there is a need for careful planning of all educational interventions aimed at promoting healthy diets and lifestyles. Information is needed to identify target groups and to develop educational objectives, strategies, methods and resources given local, political, economic and social contexts.

60. The goal of nutrition communication efforts is to change specific dietary behaviours that contribute to poor health. Available evidence indicates that nutrition communication compares favourably with other nutrition interventions in regard to cost-effectiveness. Maintaining nutrition communication programmes over a long period of time is essential to sustain meaningful behavioural changes.

61. Local and national mass media can play a major role in nutrition and health promotion. Their complete involvement must be ensured by including media leaders in the early stages of programme development. By learning more about the importance of particular diets and lifestyles and about the ways in which these interventions spread from one social stratum to another, they will also be in a better position to influence their colleagues in order to convey balanced messages to the public when commercial interests promote such products as cigarettes and liquor or unhealthy diets and lifestyles.

62. The development and production of educational material suitable for mass media presentation must conform to well-established principles. The skills of mass media experts can be used for this purpose and to better assess the best way of amplifying community action. From the experience to date, the following generalizations about nutrition communication can be made: specific behaviours have the best chance of being adopted; sustained effort is needed for success; frequent, direct message exposure is essential; in-

depth research may be needed to build an effective communication strategy; identifying and reaching appropriate target audiences are critical; and consumer preferences are key to designing effective nutrition communication campaigns.

63. In both developed and developing countries, professionals, including doctors, nurses, teachers, agricultural extension workers and other community workers, miss opportunities to promote healthy diets and lifestyles because their training has not prepared them to do so. Both formal and in-service training are essential components of the overall strategy to improve their skills to promote healthy diets and lifestyles.

COMMUNICATING TO CHANGE BEHAVIOUR TO IMPROVE NUTRITION

In the past two decades effective approaches to encourage behaviour changes to improve nutrition have been developed through nutrition communication. These approaches use various modern communication techniques, including principles of marketing and behavioural science, to identify specific nutrition-related behaviours within a wider social context and to develop appropriate messages and materials for target audiences. The involvement of community members in the development and implementation of communication strategies is necessary. Programmes that have adopted these approaches have had a positive effect on nutritional status among low-income groups as well as others.

For maximum effectiveness, nutrition communication should take into account consumer preferences, the availability and cost of specific practices and the expected nutritional impact of the proposed behaviour change. Most nutrition communication programmes have focused on influencing consumers and care-givers to improve infant and child feeding practices, to support breast-feeding and to correct deficiencies of vitamin A and other micronutrients. In addition, some programmes have focused on strengthening the confidence of the care-giver and influencing others within the household or community to reallocate resources and overcome resistance to change.

Nutrition communication approaches that have been effective allow the following conclusions to be made:

- Specific, action-based behaviours have the best chance of being adopted.
- Long-term effort is needed to sustain behaviour change.
- Frequent direct message exposure is essential.
- Background information through appropriate research is needed to build an effective communication strategy.
- Identifying and reaching appropriate target audiences are critical.
- Consideration of consumer preferences is key to designing effective nutrition communication campaigns and products.
- Community leaders and networks are effective in promoting solutions to nutrition problems.
- Interpersonal and mass media channels should be examined to evaluate how many people receive the provided messages and how often they receive them. Most programmes need a combination of interpersonal and mass media strategies to be effective.
- Outreach workers must be properly trained in appropriate interpersonal and communication skills and must be supervised.

Policy-makers, government officials, programme managers and other decision-makers can do much to strengthen nutrition communication programmes, including: giving nutrition communication high priority and providing adequate resources including staff with well-trained programme managers and health educators; adopting a multidisciplinary approach to identify nutrition problems and to plan interventions; linking nutrition interventions to other health and socio-economic development programmes; gradually building programmes, concentrating on two or three nutrition interventions and specific behaviours that can have a major nutritional impact; enlisting help from universities, advertising agencies and other groups with appropriate expertise; recognizing the minimal recurrent costs per recipient in relation to start-up costs; and providing adequate time frames and long-term commitment of personnel and other resources to bring about sustained changes in behaviour.

Source: M. Parlato, C. Green and C. Fishman. 1992. "Communicating to improve nutrition behaviour: the challenge of motivating the audience to act." USAID Nutrition Communication Project. Washington, DC, Academy for Educational Development.

64. The *health sector* bears a large responsibility in the promotion of healthy diets and lifestyles. Their promotion must be part of the routine activities of health services and also an active part of health protection and promotion activities offered to individuals or groups at risk.

65. While the *school system* has responsibilities related primarily to children and adolescents, health education initiatives in schools can also have a positive effect on adult family members. Nutrition education should become an integral part of a comprehensive school health education programme that can reach youth and school-age children both in and out of the school setting. The availability of relevant school curricula on nutrition, the preparation of teachers, the production of pertinent educational materials, the modification of the school environment to promote healthy diets (e.g. creating school/community gardens, promoting food safety in the community, etc.) and cooperation between school, parents, the community and the local health, agriculture and social services are essential elements of a nutrition education programme.

66. Good nutrition can be promoted at *work sites* by subsidizing meals or encouraging the sale of meals that are nutritionally well balanced. In addition to providing a direct benefit to the workers, these practices and others, such as sponsoring or encouraging sports teams and exercise facilities, discouraging the abuse of tobacco and alcoholic beverages and providing a clean environment and safe working conditions, all support healthy lifestyles among the workers.

67. The role of the *food industry* in promoting healthy diets lies mainly in the development and marketing of a variety of safe and good quality foods that can contribute to a healthy diet. It is clear from increased sales of products such as low-fat milk products that the food industry can and will respond to consumer demands based on decisions to improve health. The role of the nutrition and the health education community in providing appropriate messages to create this demand is important. Legislation and regulations related to food labelling and advertising can encourage industry and the commercial sector to represent accurately, and truthfully promote, the nutritional qualities of food as well as to maintain standards of quality and safety.

68. Producers and providers of *food services* can play an important role in promoting healthy diets. With proper guidance, legislation and supervision, food services may be good instruments to promote adequate diets and other aspects of healthy lifestyles because of their popularity and widespread use by many schoolchildren, commerce and factory workers and other people who spend part of the day relatively far from their homes.

69. Within countries, objectives to improve nutrition and promote healthy diets have numerous implications for the economics of farming, industrial and social policies and international trade. It will inevitably take time for coherent policies and programmes to emerge and for entrenched attitudes to change. In some countries, the promotion of traditional diets associated with lower risk of diet-related non-communicable diseases has resulted in increased attention to promoting the production and marketing of traditional foods.

Preventing and managing infectious diseases

70. Prevention of infection and management of infectious diseases involves the reduction of their incidence, duration and severity. Priority areas of action include health education, environmental health and food hygiene control, immunizations, curative care, growth monitoring and promotion, as well as PHC.

71. Much of infectious disease is behaviour-related. Health education attempts to change attitudes and behaviour. Informing the public and groups at risk of disease about the transmission of infectious and parasitic diseases, sanitation, food hygiene, diarrhoea prevention and home treatment will reduce disease transmission. The incidence and severity of diarrhoeal episodes in infants, including those over six months of age, can be reduced by promoting breast-feeding. Health education to prevent diarrhoea should also include weaning food preparation, the use of fermented foods, water treatment, personal hygiene and sanitation. Health education directed towards specific groups, such as mothers who attend clinics, or operating through radio and television can have wide impact (WHO, 1986; UNICEF, 1991). Practical health education in schools can reach parents as well as pupils. Non-formal educational programmes, including literacy classes, can also include health education subjects. In Indonesia, a large nutrition communication and behaviour-change project demonstrated that education alone could improve the nutritional status of specific vulnerable groups.

72. Environmental health programmes that address safe water, human and town waste disposal and adequate housing have the potential to reduce significantly morbidity from various water- and faecal-borne infectious diseases. For example, in a Colombian project financed by the World Bank, each 10-percent increase in the number of latrines resulted in a 15-percent decrease in the proportion of children with nutritional problems. Safe water supplies can also greatly reduce the incidence of diarrhoea and various water-borne infections.

73. Food-borne diseases are widespread and highly prevalent. The majority of cases of diarrhoea are food-borne, and so are many other infections due to bacteria, viruses, mycotoxins and parasites. Measures to prevent these diseases include the promotion of food and personal hygiene, as well as food quality control and legislation, including, for example, regulations for milk pasteurization and the chemical and microbiological quality of processed foods. Food-safety programmes contribute significantly to breaking the malnutrition-infection complex.

74. Immunization coverage has risen steadily in most developing countries over the last ten years, but it is still not always adequate for immunizations requiring multiple visits. Coverage could be increased substantially if children coming to health clinics could be weighed and immunized during the same visit, thereby reducing the risk of losing contact with the child. Missing these opportunities is considered to be the reason for 69 percent of non-immunizations.

75. Early and adequate curative treatment of infectious diseases can have an important effect on nutritional status. The outstanding successful example is oral rehydration therapy for diarrhoea, now widely accepted and used. Adequate food intake during and after diarrhoeal episodes, especially chronic diarrhoea, reduces the impact on nutritional status and hastens recovery. The provision of curative services at home or in clinics for acute respiratory infections, diarrhoea, malaria and childhood and parasitic diseases all contribute to the prevention of malnutrition. The availability of essential drugs influences the utilization of the health services and their success in shortening disease episodes and improving nutritional status.

THE HIV AND BREAST-FEEDING

With the increasing prevalence of HIV (human immunodeficiency virus) infection around the world, growing numbers of women of child-bearing age are becoming infected with this virus, which can be transmitted to their unborn or newborn babies. Roughly one-third of the babies born worldwide to HIV-infected mothers become infected themselves. Much of this mother-to-infant transmission occurs during pregnancy and delivery, although recent data confirm that some of it occurs through breast-feeding. Fortunately, the vast majority of babies breast-fed by HIV-infected mothers do not become infected through breast-feeding.

WHO and UNICEF jointly convened a technical consultation in 1992 to consider all available data on HIV transmission and breast-feeding. The consultation concluded that, in areas where infectious disease and malnutrition are the main causes of infant death and the infant mortality rate is high, mothers should be advised to breast-feed their babies. This is because the risk that the baby will be infected with the HIV virus through breast milk is likely to be lower than the risk of death from other causes if the baby is not breast-fed. Women living in these settings who know that they are HIV-infected and who have appropriate alternative feeding options should seek advice from their health care providers in making their decision on how to feed their infants most safely.

On the other hand, in settings where the main cause of death during infancy is not infectious disease and the infant mortality rate is low, the usual advice to pregnant women who are known to be infected with HIV should be the use of safe feeding alternatives for their baby rather than breast-feeding. In these settings, voluntary and confidential HIV testing, including pre- and post-test counselling, should be available to women, and they should be encouraged to seek testing before the delivery of their baby.

76. For AIDS victims, treatment is not available, nor has a vaccine been marketed. Even if an effective means of treatment were to be discovered, the cost would likely make it unavailable for a large number of the victims. Proper health management for those suffering from AIDS includes adequate diet and measures to minimize exposure to common infections. Prevention is mainly focused on the avoidance of exposure to the virus through trauma, injections or sexual contacts. Efforts are currently being integrated with other programmes to prevent sexually transmitted diseases, especially among such groups as prostitutes and their clients.

77. Early detection of growth faltering through growth monitoring and promotion programmes is one of the major combined approaches to the malnutrition-infection complex. The causes of growth faltering have first to be identified and appropriate action taken, either at the health centre or at community level. Often infection is the primary cause of growth retardation. The capacity of health personnel and community leaders to make this kind of diagnosis of growth faltering has to be greatly increased. Many countries are now developing community-based growth-monitoring promotion programmes, often as a cooperative effort between the communities, government health services and NGOs.

78. The accessibility, acceptability and adequacy of health services strongly influence whether people will benefit at all from health services and whether they will alter their behaviour to improve their health. The extension of MCH services, in particular, to remote or underserved areas can do much to alleviate infection and malnutrition.

79. PHC or community-based health care is the fundamental way of responding to the community's needs in this area by ensuring community members' active participation in the planning and implementation of their own health care, by generating health awareness and by mobilizing the community and successfully preventing infections through environmental changes and modification of harmful health practices.

80. To address the more basic and underlying causes of malnutrition and infection, activities outside the health sector are equally relevant. Each infection has its own transmission mechanism and most are related to the environment. For instance, the

spread of respiratory diseases is linked to conditions of overcrowding. Water and food contamination, lack of sufficient water for personal and household hygiene and human contact with insects and other animal life directly contribute to diarrhoeal disease transmission. Transmission of intestinal parasites is facilitated by improper disposal of excreta, which allows parasites to enter the body via the skin or mouth. The transmission of other parasites, malaria and schistosoma is facilitated by vectors where environmental conditions, either naturally occurring or designed by humans, permit vectors to thrive. Alternative strategies such as intermittent irrigation adopted in India and Portugal have successfully decreased mosquito breeding and subsequently lowered the incidence of malaria. Good engineering design can avoid the dangers of the spread of schistosomiasis when dams and irrigation systems are constructed.

81. In most instances, specific health programmes aimed at preventing or reducing the reproduction of the infecting agent or its transmission, directly or through vectors, are needed. However, precautions to ensure that new or existing projects or development activities do not create additional health problems are also necessary. A nutrition or health impact statement should be included in the documentation of all proposed development projects.

Caring for the socio-economically deprived and nutritionally vulnerable

82. Policies to improve care for vulnerable individuals, such as infants, young children and mothers, should attempt directly to strengthen the capacity of the family as a social and economic unit to provide care. Care is also an important component for the health and nutritional well-being of other vulnerable members of society, including the elderly, the disabled, refugees and the displaced. Providing adequate care for these people will often require strengthening the capabilities at the community, national and international levels.

83. **Encouragement of breast-feeding.** The first type of care required is for the infant and it focuses on breast-feeding. This is the basis of a dynamic relationship between mother and infant, having psychological and social dimensions as well as the physical one — that of supplying breast milk. It is important to ensure that breast-feeding is soundly and adequately established from the beginning, that colostrum is utilized in the first days of life and not discarded and that infants are solely breast-fed for four to six months. This entails giving proper advice and encouragement to the mother both before and after the baby is born. As more deliveries take place in maternity units or hospitals in developing countries, it is crucial to ensure that appropriate facilities exist and practices that encourage breast-feeding are followed. For instance, the infants should be in the same room and bed with the mother.

84. The realization that negative influences often affect maternity services, including the unnecessary use of breast-milk substitutes, has led to the development of ten criteria for "baby-friendly hospitals". Programmes are now being extended around the world to develop baby-friendly hospital approaches and training programmes. Practically all countries are in need of swift and determined action along these lines to prevent further undermining of breast-feeding as urbanization advances. National programmes for breast-feeding protection and promotion need to be drawn up and implemented. Criteria for the assessment of the status of breast-feeding in individual countries have also been drawn up and need to be used in monitoring those programmes. In addition, individual counselling and encouragement of mothers concerning the advantages of breast-feeding needs to be intensified in all health facilities. Countries with low rates of breast-feeding should aim to reverse the decline, and those with more adequate breast-feeding practices should aim to preserve and even improve the present status, especially in urban areas.

85. **Feeding young children.** After four to six months of life the weaning process begins, with the gradual introduction of supplementary foods suitably prepared for the infant's digestive capacity, in accordance with local food availability and cultural traditions. While many countries have national guidelines for infant feeding, others do not. Sometimes the existing guidelines were drawn up in the years before there was full awareness of the importance of frequent feeding (four to six times daily) and of adequate energy density in infant foods. The importance of using a sufficiently concentrated cereal porridge (traditional mixtures are often too dilute) and adding some vegetable oil may need to be stressed more, along with the better use of foods such as pulses and green leafy and yellow vegetables, which are rich in protein and micronutrients. Use of fermented or malted cereals during the weaning period is also advantageous and should be promoted if it has already been tested in the country, or research should be carried out if it has not yet been studied.

86. Clearly, such dietary guidelines for infants and young children should be adapted to local food availability and customs. Often there is a need to adapt national guidelines to different ecological zones and dietary patterns in a country. Emphasis must also be

placed on the importance of continuing close care and nurturing by the mother or other care-givers, particularly during episodes of infection and during the second year of life in general when the young child is more often in the hands of a grandparent or an older sibling.

87. **Maternal well-being.** In many households, the principal providers of care are women. As a result, the capacity to provide care at the household level largely depends on the health of the mother, her education, her time and energy, the control she has over the resources of the household and her ability to use them effectively. Thus, in order to ensure appropriate care at the household level, several types of action are needed. First, it is necessary to promote the mother's physical and mental health by providing access to health and related services, including general health, prenatal and obstetric care and family planning services. Dietary guidelines for mothers during pregnancy and lactation are also needed and should be widely disseminated. Encouraging parents to space pregnancies over adequate time periods can benefit both mothers and children. Births spaced too closely together may result in low birth weight and an inadequate capacity for care of the newborn and other young children. The mother herself may be nutritionally depleted from too frequent births and overburdened by too many tasks, including demands of child care. It is important that education on the value of family planning be targeted towards men as well. Also, the benefits of breast-feeding in contributing to longer birth intervals can be stressed in this context.

88. Action needs to be taken to increase maternal education and literacy, as education and beliefs influence the skills and knowledge required for successful child care practices. Education carefully tailored to child care is especially important and should include the importance of exclusive breast-feeding in the early months of life, increasing the energy density and quality of complementary foods, ensuring appropriate weaning practices, decreasing food contamination and maintaining frequent feeding. Maternal education can also affect parental decisions regarding expenditures of time and resources. In addition, improved literacy and increased education of the father should be encouraged as his beliefs and commitment to the welfare of his children have significant effects on their nutritional well-being.

89. The amount of time available to a mother and her workload and ability to earn income also have a great influence on children's nutritional status. Often, the income controlled by women has greater immediate benefit for the family's nutritional well-being than general, or male-controlled, income. When a mother is unable to care for a child because of work, there can be negative effects on the child's nutritional status. On the other hand, the increased income that a working mother acquires can have positive effects on a child's nutritional well-being. Thus, an appropriate balance between time spent on providing adequate care for the family and time spent on work outside the home should be encouraged. The adoption of labour-saving techniques may be useful in lessening the workload of women. However, often the fundamental need is to promote the equitable sharing of responsibilities for care and the burdens of work in general among household members.

90. **Care for the elderly and disabled.** The elderly are rapidly becoming a substantial proportion of the population in both developed and developing countries. Proper nutrition plays an important role in postponing or preventing the development of diet-related non-communicable diseases later in life, and promoting healthy diets and lifestyles during childhood and adult life can minimize their occurrence in later life. Food intake usually decreases with age. This is often associated with decreased needs due to lower basal metabolic rate, reduced physical activity and lowered lean body mass. Other factors such as apathy and depression can contribute to decreased appetite, as can the use of some medication and alcohol. Growing impoverishment among the elderly also increases the risk of nutritional deficiencies.

91. The elderly often become socially isolated and programmes to address this problem may be needed. Community-based health care services for the elderly need to be fully integrated into PHC. Programmes providing food commodities or prepared meals for the elderly can help to ensure adequate and balanced diets. In general, traditional family care structures found in most societies are supportive of the elderly. However, as noted, many of these structures weaken as populations become more urbanized or impoverished.

92. Strategies to care for the disabled should aim to prevent dependency and enable people to become self-supporting. They should promote and strengthen the organization in the family and the community that helps people to cope with their disabilities. Job and skills training may need to become more effective.

93. **Care at the community level.** In many communities, traditional support systems, such as the extended family, have strong benefits in providing support for people during times of stress. These social supports from family or community can increase the care for both women and children through a reduction of the workload, increased knowledge or emotional support and economic assistance. Community support is also critical for solving problems of child care or work burden through the formation of child care centres, work groups, cooperatives or informal networks for sharing tasks. However, this form of support is being eroded by urbanization and rapid social change. Therefore, action needs to be taken to enhance the promotion of women's organizations, to assist older siblings who are responsible for young children and to encourage the father's participation in child care through media and support groups.

94. Care at the community level is another important component of the strategy to improve nutrition. In traditional societies, especially in rural areas, much depends on the capacity of the village administration to identify nutritional problems and generate appropriate action. Although effective action may take place, for example, through proper organization of agricultural, social and income-earning activities in the village, even when awareness or analysis of the nutritional issues is lacking, strengthened village structures can play a very useful role in assessing nutritional problems and generating appropriate responses. Government structures at the village level may need to be strengthened through democratization, decentralization of responsibilities and the introduction of training programmes for community leaders to provide necessary analytic and management skills. Development of local human resources and of specific nutrition-oriented action in each community should be well-defined components of district development plans.

95. This type of action may be more difficult in an urban environment than in rural areas because of the breakdown of traditional structures and values and the fragmentation of society. Problems of both overnutrition and undernutrition may be present and addressing them will require different organizational approaches. It is important, therefore, to include nutritional considerations in the urban planning and local government processes.

96. **Care at the national level.** At the national level, efforts need to be made to develop appropriate technologies and better infrastructure that can reduce the demands on women's time and efforts, in particular. These should aim to reduce the burdens of water collection and fuel gathering, facilitate access to health services, improve hygiene and sanitation and ensure women's access to improvements in agricultural and food-processing technology.

97. Women's rights to property and income need to be strengthened through legislation. For example, women's access to credit needs to be improved. Furthermore, women's control over the household income should be enhanced through the fostering of opportunities for women's employment, as well as increasing returns from household assets.

COMMUNITY PARTICIPATION IN TANZANIA'S IRINGA NUTRITION PROGRAMME

Social mobilization is one of the essential features of the Iringa Nutrition Programme in Tanzania. According to the Joint WHO/UNICEF Nutrition Support Programme, social mobilization combines advocacy and education at all levels of the administrative hierarchy. Advocacy entails promoting awareness of nutrition problems and devoting resources to their solution. Education goes hand in hand with advocacy to ensure that those motivated to act have the tools and capabilities at their disposal to do so effectively.

One of the objectives of the programme was to improve capabilities at all levels of society to assess and to analyse nutrition problems and to design appropriate action. In this respect, community-based growth monitoring was a particularly successful activity. A household and village registration system was maintained by village health committees supported by village health workers. The village provided vital population statistics. All children under five years of age had growth charts and were weighed at village health posts at least every three months. Child growth performance was recorded in household registers and reports were compiled to establish the aggregated performance of children in the village. The village health committee advised and counselled parents of children whose growth performance was poor. Death records of children in the village were kept, indicating the child's age and last signs or symptoms of illness prior to death.

In order to assess the outcomes of programme activities a household survey was conducted. Mothers' understanding of both growth charts and use of oral rehydration salts (ORS) was verified.

Knowledge of the growth chart was very good, as almost 80 percent of mothers who were interviewed showed full understanding. Knowledge of ORS was less complete, with the largest number of mothers having only a partial understanding of the proper way to mix ORS.

After three years of project activity, the general impact on nutritional status was analysed on the basis of the prevalence of mild and severe underweight. Between 1984, when the project began, and 1987, there was a marked reduction in the number of young children with severe underweight status (below 60 percent of the reference value of weight-for-age), from 6.3 to 1.7 percent, and a reduction in the number of children who were moderately underweight (i.e. below 80 percent of reference value), from 51 to 37 percent, in the original 168 villages. In 442 other villages in Iringa that were not involved in the project the percentage of children who were severely underweight in 1987 was 5.6 percent, while those who were moderately underweight was 50.7 percent. Death among young children were also greatly reduced in the project villages. These data confirm the strong impact of the Iringa Nutrition Programme on young-child malnutrition and illustrate a major achievement in developing the capacity of households and communities to cope with their nutrition situation.

Source: The Joint WHO/UNICEF Nutrition Support Programme in Iringa, Tanzania. 1983-1988 Evaluation Report. 1988.

98. Governments need to make efforts to provide social security for women where possible. For instance, rights to maternity leave are an important policy issue with potentially far-reaching benefits for the health and nutrition of women and their children.

99. **Care of refugees and displaced persons.** Strategies to provide care operate also at the international level. In particular, when refugees cross international borders, international agencies are called upon to protect their welfare. Refugees are more likely to suffer from the same types of diseases found among other vulnerable groups in developing countries because they have become destitute. Malnutrition, infectious diseases and mental and emotional illnesses are some of the more common consequences of displacement. Furthermore, many refugees are unlikely to return to their homelands.

100. Refugees and displaced populations, like other vulnerable groups, should not be seen as totally or permanently helpless and dependent. They need resources to help them cope with deprivation, meet their basic needs and become self-reliant, if necessary, in their new surroundings. Where food rations are provided, allocations should be based on need and not on the immediate availability of certain resources from donors.

Assessing, analysing and monitoring nutrition situations

101. Information is essential for effective decisions to be made regarding policies and programmes to improve the nutritional well-being of the population. To be useful, information must be provided to the appropriate decision-makers at various levels, ranging from the individual to the international level, in a timely manner and in an easily understood format.

102. Information related to nutrition is needed for a variety of purposes, such as: identifying chronic nutrition problems and causes; predicting and detecting short-term or acute nutrition problems; targeting population groups for both short-term relief efforts and longer-term policy and programme development; monitoring changes; and evaluating the impact of development programmes and of short- and long-term interventions.

103. As nutrition is an outcome of a wide range of social and economic conditions, the nutritional status of a population is a sensitive indicator of the overall level of development of a society. Nutrition-related indicators, such as the number of undernourished, the prevalence of PEM or the distribution of adult BMIs, used along with the more traditional indicators of national development, such as GNP, would be a good measure of human welfare and development.

104. Efforts to collect and analyse nutritional information should be directed toward meeting the needs of decision-makers. All too frequently, information may be collected and not used. Without a clear understanding of what information is needed, by whom, when and for what purpose, a considerable waste of time and resources may occur.

105. Ideally, information should be provided on the number of people who are currently affected by specific types of malnutrition as well as those who are likely to become malnourished. Additional information about the location of malnourished groups and changes in their nutritional status over time should also be provided. Gathering information on the factors affecting nutritional well-being is also important for programme development and monitoring.

106. An initial distinction needs to be made between priority nutritional problems due to underconsumption and infection, which is the major problem in most developing countries, and chronic diet-related non-communicable diseases, which are also prevalent in most countries. Acute food crises, due to natural or human-caused emergencies, should be distinguished from endemic or chronic undernutrition, which is often the most serious problem, and micronutrient deficiencies. An initial assessment is needed to establish which problems are priorities and to identify the people most affected. This can usually be based on a compilation and analysis of existing information. However, the possibility of biases occurring if non-representative samples are used should be taken into account.

107. **Assessing and monitoring nutrition problems.** Generally, the most practical approach to nutrition monitoring is to use a minimum number of indicators and to focus on those that lend themselves to regular assessment. The prevalence of underweight in pre-school children is the most commonly used indicator of undernutrition. The data sources include the collection of growth-monitoring data from communities, health clinics or schools, periodic sample nutrition surveys and national or local household surveys carried out for various purposes. It is essential to obtain periodic representative data from the relevant administrative unit, for example, the district. It is useful to concentrate on trends using the same indicators on the same communities (sentinel sites), which are

either obtained from ongoing surveillance activities or repeated surveys. Some disaggregating below the national level by criteria such as administrative areas, urban/rural areas, ecological zones and possibly selected socio-economic factors, such as income source, access to services and programmes, is useful if such data are available.

108. The causes of malnutrition need to be continuously reviewed and can be grouped in relation to household food security, health factors and care, as discussed in Chapter 2. Assessing and monitoring nutrition situations requires some information on each of these factors. Again, some data may be obtained from existing sources.

NUTRITION MONITORING — TYPICAL INDICATORS

- **Food crises**
 - Production patterns
 - Market prices
 - Food stocks
 - Fall in body weights
- **Protein-energy malnutrition**
 - Children's anthropometry (weight/height, weight/age, height/age)
 - Children's growth
 - Infectious disease rates
 - Food intake relative to need
 - Body mass index
- **Household food security**
 - Employment levels
 - Market prices
 - Changes in real income and purchasing power
 - Dietary energy supplies
- **Caring capacity**
 - Maternal education
 - Literacy rates
 - Maternal employment
 - Public expenditure
 - Breast-feeding (duration/percent)
- **Malnutrition-infection complex**
 - Incidence of diarrhoea
 - Immunization coverage
 - Sanitation (type of toilet)
 - Availability of clean water
 - Child weight-for-age
- **Micronutrient deficiencies**
 - Iron deficiency: rates of anaemia
 - Vitamin A: night blindness-xerophthalmia in children
 - Iodine: goitre, cretinism
- **Non-communicable chronic diseases**
 - Rates of morbidity/mortality: cardiovascular disease, diabetes, obesity, some cancers; comparison with infectious disease rates
 - Age distribution of population
 - Age-specific mortality
 - Changing dietary/lifestyle patterns

109. In the special case of *food crises* due to drought, economic stress, migration or warfare, timely commitment of resources for public works and food distribution is required. Often, the most important early warning indicators are based on forecasts of food availability and price indicators. In drought-prone countries, it is useful to combine data on rainfall and food crop and livestock conditions with other information on food stocks and reserves, market conditions and various socio-economic indicators to predict food crises. Recent experiences in Botswana, India and Indonesia show that, where determination to alleviate food crises exists, it can be done successfully, with information playing an important role. Where national or subregional early warning systems have been set up, they provide valuable information in this respect. Possibilities for enhancing the availability of relevant data include: listening to popular concerns, including those expressed through the free press; observing behaviour changes; using indicators based on the prices of food, sentinel sites and rapid assessment procedures; and monitoring the implementation of interventions.

110. Efforts to address *endemic undernutrition* are often based on the assessment and monitoring of general nutritional outcomes, usually the anthropometry of children, birth weights, women's weights and heights and sometimes mortality rates. While assessing household food security status may be difficult, monitoring indicators such as changes in food prices may be relatively simple and are reported in some national early warning systems. When selecting appropriate indicators for monitoring, efforts should be made to use those from existing survey data, including the analysis of routinely gathered information such as prices and local production changes. Research results, local discussions and other methods can provide additional information.

111. For health status, the main considerations are the malnutrition-infection complex, PHC and healthy lifestyles. Monitoring of *infectious diseases* is undertaken at the community level through the PHC service, if one has been developed, and through the health system, by notification of infectious diseases. The incidence of infections, the most important being diarrhoeal diseases, respiratory infections, malaria and measles, is followed through this system. The main interventions to be monitored by the health sector are: management of infectious diseases; immunizations; use of oral rehydration therapy; health and nutrition education; control of micronutrient malnutrition; and environmental health action, including safe water and food and waste disposal. Assessment of healthy lifestyles implies monitoring physical exercise and smoking, as well as diet and the incidence or prevalence of the main diet-related non-communicable diseases as discussed below.

112. Methods to assess and monitor the ability of households to provide *adequate care* need to be developed. A central set of issues involves the constraints placed on women and the efforts to improve their position. Measures of educational status, access to and control over resources, ability to use health and agricultural services and technologies, property and income rights, as well as workload, should be analysed by sex where relevant. Women's nutritional status, including anaemia, should be assessed when possible.

113. Monitoring of breast-feeding practices and their determinants should be undertaken, given the prime importance of *breast-feeding* for nutrition in early life, as well as its influence on maternal health, for example, through pregnancy spacing. Infant feeding and weaning practices should be assessed, at least qualitatively.

114. *Micronutrient deficiencies* — primarily of iodine, iron and vitamin A — can be assessed and monitored in terms of food availability and consumption, clinical signs of deficiencies, biochemical tests and monitoring of control programmes. Combining of survey data and information from the health system can provide the essential information.

115. There is evidence that certain dietary patterns are risk factors for some *diet-related non-communicable diseases*, including cardiovascular disease, diabetes, obesity and some forms of cancer. Following dietary patterns and disease trends may be useful. Trends often assessed at the national level from Food Balance Sheet data relate to total energy intake and percentage of energy from fat and from fat of animal origin as an approximation of saturated fat. Where subpopulation groups are believed to be at risk, periodic food consumption surveys of such groups are desirable. It will be more effective if these survey data are used for comparison with desirable dietary intake goals, since Food Balance Sheet data do not reflect the actual food consumption of an individual or provide estimates for subpopulation groups. As detailed national mortality and morbidity data are not readily available in many developing countries, use of data from selected sites may be helpful while systematic coverage through the health system is built up. Where feasible, monitoring of some intermediate health indicators, including blood pressure, blood glucose, serum cholesterol and body mass index, may be desirable to assess diet-related non-communicable disease in groups at risk. Initially, this information could be obtained from health clinic data.

116. **Strengthening nutrition information systems.** Information is also needed on the implementation of programmes aimed at resolving particular nutritional problems or targeted at a particular group or geographic area. Such information has been widely collected on the iodine deficiency disorder (IDD) control programmes and is now being extended to other micronutrient programmes. The main actions of the IDD programme have been identified and a scoring system that measures the degree of implementation of each action has been established. Monitoring the implementation of programmes has proven to be an effective management tool, and this approach should be broadly applied to all components of nutrition programmes.

117. The resources used for data gathering and analysis must be seen in relation to the efficient use of the large resources required for actions and interventions to improve the situation. Clearly, only relatively minor resources for information would be justified in an exploratory phase. However, information is inexpensive when compared with expenditures for ineffective activities, and expenditures on information in the absence of action is clearly inappropriate. On the other hand, interventions likely to have a significant effect on nutrition, especially via household food security, are expensive. The cost of obtaining relevant information including that through special surveys is likely to be justifiable in terms of assuring effective use of public funds.

118. Existing sources of data should be drawn on as much as possible, particularly when resources are very strained. In many countries, growth monitoring programmes are useful sources of data. Birth weights, when available, could also be compiled. Price monitoring is part of many routine statistical systems, and it may be used for monitoring trends in household food security. Programme management data may also be relevant. Adding nutritional measurements to household surveys is also common. The possibility of processing household expenditure data to assess food energy consumption needs to be explored. When available data are very limited, and rapid reporting or improved quality is important, the use of sentinel sites should be considered.

119. Rapid appraisal procedures have a potentially important role in all phases of community assessment, including initial assessments and follow-up of reports received. This would be in addition to their established role of obtaining detailed, often qualitative, information on programme delivery.

120. Developing institutional capacity is central to efforts to monitor nutrition. In most cases where monitoring systems have been initiated, sustained support has allowed the system to evolve over a period of years. At this point, they become part of an effective cycle of information and action. Many countries are still at the stage of establishing coherent national programmes and nutrition information systems, generally starting with

data on childhood undernutrition. Often, with the use of established data sources and information systems, a more multifaceted system can be developed in accordance with a country's priorities and resources. In creating these systems, emphasis should be placed on the information needed for the actions to be implemented.

121. **Global support for nutrition monitoring.** Decisions made at the global level, based on the assessment of food security, tend to have two objectives: to advocate the allocation of resources to address broadly hunger and malnutrition and to alert donors to impending food crises, mainly for the purpose of allocating supplies and funds for emergency food aid, which are then discontinued at the conclusion of the emergencies. These decisions are based on various sources, two of which are FAO's Food Balance Sheet procedures and the Global Information and Early Warning System (GIEWS).

NUTRITION MONITORING IN THE UNITED STATES

Nutrition monitoring in the United States is vital to policy-making and research. Monitoring provides information and a data base for public policy decisions related to nutrition education; public health nutrition programmes; food assistance programmes; federally supported food service programmes; the regulation of food fortification, safety and labelling of the food supply; food production; and marketing.

Nutrition monitoring activities in the United States date back to 1896. However, a formalized National Nutrition Monitoring System (NNMS) was not initiated by the federal government until the late 1970s, when Congress requested that the US Department of Agriculture and the US Department of Health and Human Services develop a coordinated and comprehensive system for monitoring. The NNMS consists of five components: nutrition and related health measurements; food and nutrient consumption; knowledge, attitudes and behaviour assessments; food composition and nutrient data bases; and food supply determinations. In addition to the two cornerstone surveys (Nationwide Food Consumption Survey/Continuing Survey of Food Intakes by Individuals and the National Health and Nutrition Examination Survey), there are approximately 40 surveys and surveillance systems that gather and report related data.

In 1990, the National Nutrition Monitoring and Related Research Act was signed into law. This law was designed to strengthen national nutrition monitoring by requiring the Secretaries of Agriculture and Health, respectively, to prepare and implement a ten-year comprehensive plan for a coordinated programme to assess and report on a continuous basis the dietary and nutritional status of the population. Federal efforts in nutrition monitoring have focused on describing the food and nutrition situation among the general population and by age, sex, race and ethnic subgroups. In addition, states, local governments and NGOs monitor certain aspects of nutrition, including, for example, measures of food insecurity among low-income households with children.

122. Estimates made by FAO from Food Balance Sheets, which give levels and trends in dietary energy availability by country and year, can be combined with information from FAO's GIEWS to give more current assessments of trends in food availability. This would allow the approximation of current levels of undernutrition at the global level for groups of countries or, possibly, for single countries with a running average. This would be useful for monitoring changes from year to year. The approach appears feasible in principle, but the methodology requires testing.

123. International health monitoring projects under way through WHO, such as the MONICA and EURONUT projects, involve a number of countries. The MONICA project collects information on trends in cardiovascular diseases and risk factors, including information on the qualitative aspects of diet. This project is being extended to include some developing countries through the Global Cardiovascular Disease Monitoring and Prevention Network (GCMP Network). The EURONUT study aims to explore dietary patterns among the elderly populations in 12 European countries.

124. The global nutritional anthropometry data bank and the Global Data Base for Nutritional Trend Analysis, which was established by WHO, are expanding to include an

array of nutrition-related parameters. Also, a micronutrient data information system that includes both data on the micronutrient status and an overview of control programmes and interventions, country by country, is being set up. Training with the intention of strengthening such information systems at regional and country levels is being organized.

FAO — GLOBAL INFORMATION AND EARLY WARNING SYSTEM (GIEWS)

A global network based at FAO headquarters keeps a vigilant eye on the world food situation. The Global Information and Early Warning System (GIEWS) collects, analyses and disseminates the latest available data on all elements that are likely to affect food supply and demand. These range from weather conditions to outbreaks of animal and plant disease and from transport problems to government policies affecting production, consumption, prices and trade in basic foods.

GIEWS gathers information from a variety of sources, including national institutions and FAO country offices. Other UN agencies and over 50 NGOs engaged in field and emergency operations are also important sources of information. Crop assessment missions visit areas where the food situation is precarious or unclear.

In recent years, GIEWS has been greatly enhanced by advances in technology. The expansion of data sources, improvements in satellite and computer technology and the growing sophistication of analytical skills have all strengthened its capacity. Increasingly, GIEWS is using electronic media, such as the United Nations International Emergency Network, to deliver timely reports on potential breakdowns in food security.

A wide array of socio-economic indicators may also be used to monitor food security, including cereal stocks, market supplies, labour wages (both rural and urban), livestock prices, slaughter rates, length of queues in food shops, population movements and growth, as well as the incidence of severe malnutrition and starvation. Efforts are under way to improve the use of nutrition and socio-economic indicators in GIEWS reports.

Bearing in mind that food security depends ultimately on people's access to adequate amounts of food, ways of assessing not only the availability of food but also its distribution are being explored. A useful beginning has been made with risk mapping, which indicates — only for a few selected countries at present — who and how many people are most at risk of food insecurity, why they are at risk and what their current food security and nutritional status is.

Bibliography for Chapter 4

- FAO/WHO.** 1992. Improving household food security: theme no. 1. *Major issues for nutrition strategies*. International Conference on Nutrition, Rome.
- FAO/WHO.** 1992. Protecting consumers through improved food quality and safety: theme no. 2. *Major issues for nutrition strategies*. International Conference on Nutrition, Rome.
- FAO/WHO.** 1992. Caring for the socio-economically deprived and nutritionally vulnerable: theme no. 3. *Major issues for nutrition strategies*. International Conference on Nutrition, Rome.
- FAO/WHO.** 1992. Preventing and managing infectious diseases: theme no. 4. *Major issues for nutrition strategies*. International Conference on Nutrition, Rome.
- FAO/WHO.** 1992. Promoting appropriate diets and healthy life-styles: theme no. 5. *Major issues for nutrition strategies*. International Conference on Nutrition, Rome.
- FAO/WHO.** 1992. Preventing specific micronutrient deficiencies: theme no. 6. *Major issues for nutrition strategies*. International Conference on Nutrition, Rome.
- FAO/WHO.** 1992. Assessing, analysing and monitoring nutrition situations: theme no. 7. *Major issues for nutrition strategies*. International Conference on Nutrition, Rome.

Chapter 5

Meeting the nutrition challenge

1. The previous chapters have examined the magnitude, nature and trends of nutritional problems and the factors influencing them. The central role of nutrition as an input into human development and an outcome of national development has been emphasized, and the policies affecting nutrition have been reviewed. This final chapter examines basic principles that need to be kept in mind in order to improve nutritional well-being and the contributions that governments and other agencies can make to achieve this end.

Principles for incorporating nutrition into development

2. The primary need is to create an environment in which households can be expected to meet their nutritional needs on a sustainable basis. This can be accomplished by pursuing *policies for sustainable economic growth and social development* that benefit the poor and malnourished as well as policies that ensure a stable and safe food supply to meet all the population's nutrient needs. While "unaimed" economic growth and development could also lead to reduced rates of malnutrition, this is likely to take a long time and may cause considerable hardship and suffering among many of the world's poorest people. Conversely, attempts to address nutritional problems primarily through specific nutrition programmes or interventions — which are often directed at women and children — can fail to address the basic causes of the problems: poverty, ignorance, disease and social discrimination.

3. What is needed is a commitment to growth with equity — an approach which emphasizes that people and their well-being should be at the centre of national development efforts — and a mechanism for ensuring that the benefits of such development reach the poor and malnourished. Incorporating nutritional considerations into the objectives of all relevant sectors would ensure that their efforts are nutritionally beneficial. *Focused interventions*, however, which are directed toward specific problems of the nutritionally vulnerable, will still be needed, since it is not acceptable to allow the suffering and loss arising from malnutrition to continue while waiting for the benefits of greater and more equitable economic and social development to arrive.

4. In the process of promoting growth with equity while also protecting the nutritionally vulnerable, the *role of local communities* is crucial. Local communities are usually all too aware of their problems and of the conditions necessary to improve their well-being. People's participation in the planning and implementing of relevant strategy components is necessary and should be ensured. It is, in fact, the people themselves who will ultimately have to make any component of a strategy work. The worldwide trend in recent decades toward greater democracy offers real opportunities for more effective community participation in, and indeed management of, efforts to improve nutritional well-being. Empowerment of the underprivileged will lead to their greater participation in the development process and, thus, to their improved nutrition. The empowerment of women is of particular importance.

5. However, with some exceptions, community organizations and leadership are often technically weak, they are not well informed about nutritional issues and are unable to assess and analyse nutritional problems adequately or to generate necessary action. Therefore, there is a clear need for intermediate levels of government (district and provincial) to support local communities and to serve as a link between the local level, where activities are actually carried out, and the national level, where policy decisions are taken and programme resources allocated. *Strengthening the technical and managerial capacities* at both the community and intermediate levels for identifying and dealing with nutritional problems is often a necessity.

6. *Human resource development and training* are, therefore, also critical areas to be addressed. In many countries there is a lack of sufficiently trained personnel to analyse nutritional problems and their causes and to participate in the formulation of effective strategies and activities to combat the problems. The lack of technical competence, both among nutritionists dealing with non-nutritional development matters and among a variety of development planners and policy-makers dealing with nutrition, has been a major constraint for effective programme development. An increasing emphasis on district-level health and agriculture programmes aimed at improving nutrition will require an even greater

number of appropriately trained staff. Expanding the numbers of skilled people required at each level will, in turn, require a commensurate expansion of training facilities and opportunities. National institutions operating training programmes in food and nutrition have the potential to influence greatly the design, implementation and sustainability of appropriate programmes to improve nutrition.

7. In many instances particular attention will also need to be paid to *improving the status of women* in the household and in society. The critical role that women play in assuring food security by virtue of their responsibilities in food production, processing, storage and marketing is now more widely recognized. In addition, women are crucial to the family's nutritional status as a result of their roles as food preparers, holders of nutritional knowledge and information and contributors to family incomes. However, especially in the case of rural and impoverished women and because of the expanding number of women who are heads of households, specific nutritional interventions are often not designed to enhance their capabilities to meet their combined economic production and domestic responsibilities. In effect, the basic causes of poor nutrition are not being addressed adequately through such interventions, although workable strategies to combat these problems are known.

STRATEGIES TO ASSIST WOMEN AND IMPROVE NUTRITIONAL WELL-BEING

A major review of the roles and responsibilities of women in providing and sustaining family nutritional levels recommended five major groups of strategies to assist women in fulfilling these roles more efficiently and equitably. The first involves reducing the burdens of reproduction. The two most successful strategies for accomplishing this include efforts to increase the age at which women begin to have children and efforts to lengthen the time intervals between births. Both of these strategies entail increasing educational opportunities for girls, implementing information campaigns and altering the factors that favour the formation of large families (for example, reducing productive time and labour requirements, lowering poverty and lessening environmental degradation).

The second group of strategies includes methods to reduce the burdens of child care. Strategies for accomplishing this objective include increasing educational opportunities, improving health and nutrition information, providing more access to time- and labour-saving technologies, securing more equitable wage scales for women and initiating innovative child care systems, such as mobile crèche and community-sponsored day care centres.

The third set of strategies involves the improvement of access to maternal health and nutrition care. These strategies include renewing the focus on maternal as well as child health, especially in terms of broadening knowledge about and availability of pre- and post-natal care and birth attendance, expanding outreach and extension services, particularly in rural areas, and improving the quality of the services offered.

The fourth group of strategies involves enhancing the position of women in food production and farming. To achieve this, the visibility of the economic contributions of women in food production through improved data bases and national statistics should be increased and women's access to productive resources such as land, technology, credit, training and extension needs to be improved.

Finally, the fifth set of strategies involves the elevation and improvement of the position of women in society. The strategies for achieving this include increasing educational and training opportunities for girls and women, increasing the opportunities for women to generate income and to control the use of income, empowering women through organizational and political participation and altering social and cultural attitudes in favour of women's equality through the educational, political and legal institutions.

In the end, the implementation of these varied strategies will address, separately or in combination, the basic problems women face in attempting to achieve sustainable nutritional levels and health for their families: poverty, ignorance, disease, population growth, the degradation of the environment, inequalities in economic and political power and social discrimination.

Source: "Women, food and nutrition issues in need of a global focus". Women and nutrition. ACC/SCN Symposium Report. Nutrition Policy Discussion Paper No. 6. 1990.

8. To meet the nutrition challenge, all sectors – governments, NGOs, the private sector, the scientific community, bilateral and multilateral funding agencies and international organizations – have a role to play. Each of these segments acting on its own could contribute to improving nutritional well-being, but if they act in concert the impact will be much greater. Therefore, it is necessary to develop appropriate institutional arrangements and capabilities to promote such *intersectoral cooperation*. Equally, within the government, links need to be strengthened among various ministries whose policies and programmes have an impact on nutrition. Cooperation between agriculture and health ministries is of particular importance. Such cooperation is necessary, not only at the national level, but also at the provincial and district levels where programmes are actually implemented.

9. Other ministries also need to identify how they can best contribute, within their own programmes, to improving nutrition. In particular, many countries have a central planning office and specialized planning units within various ministries that should address nutritional concerns. Making improvements in nutrition an explicit objective of their policies and programmes is an important initial step. The challenge, in some countries, is to bring home to various planning units and policy-makers the practical possibilities that now exist for identifying and resolving nutritional problems.

10. The international context within which countries operate must also be considered. Both developing and developed countries need to discuss issues that ultimately affect the nutritional status of their populations, particularly those countries with population groups that have not benefited adequately from the development process. In order to make consistent improvements in nutrition, a *common commitment from communities, national governments and international agencies* is required. Bilateral organizations and international NGOs are also essential to the general development process and could participate in the elaboration and implementation of common approaches to addressing nutritional problems.

11. *Nutritional issues should also be on the agenda of various international forums*, where the focus of attention should be those countries where improvements in the nutritional situation have been slow or have not occurred. International contributions to individual countries should aim at identifying marginalized population groups whose nutritional conditions worsen during periods of social and economic crisis and who suffer from malnutrition. International support should also help these countries to prevent the type of suffering that some have experienced as a result of structural adjustment. The UN system provides a logical forum for promoting and coordinating such undertakings, and efforts of inter-agency cooperation should involve all agencies concerned.

12. Some of the most fundamental determinants of malnutrition — population growth, degradation of the environment, poverty, inequality in the distribution of economic power — are essentially structural in nature. Improving nutrition will require radical measures to address these deep-rooted problems. While these problems are being addressed, it will also be necessary to *make changes incrementally by incorporating nutrition objectives into relevant policies and programmes* and to strengthen the institutions that bring change. Such solutions have to be devised within a long-term and sustainable development framework.

13. While the above principles are proposed mainly in the undernutrition context, similar principles apply in considerable measure to the prevention of diet-related non-communicable diseases. Their prevention is largely a matter of social communication. The *role of consumers and consumer education* is paramount. Empowering consumers to adapt their diets and lifestyles in the light of better knowledge of nutritional problems is still the key. The main difference is that insufficient knowledge and/or motivation, rather than poverty or ecological constraints, are often the root problems. The appropriate vehicle for social communication is often the mass media and the primary aim is to modify individual behaviour rather than community behaviour. In addition, private and public efforts are needed to encourage the availability of the wide variety of foods required for healthy diets

along with efforts to ensure access to them, particularly by the poor. There is also considerable need for the orientation and training of health professionals and other community leaders to enable them to play an appropriate role in the prevention of nutrition problems. Countries with problems of both undernutrition and diet-related non-communicable diseases should address the latter, but not to the detriment of necessary action to be taken for the former.

INCORPORATING NUTRITION OBJECTIVES INTO NATIONAL DEVELOPMENT PLANS

The experience of Thailand

Until recently, protein-energy malnutrition (PEM) was a significant problem in Thailand, affecting half of Thai children under five years of age. In 1977, the first Food and Nutrition Plan (FNP) was included in the fourth National Economic and Social Development Plan (NESDP). The most important result of the plan was an increased awareness in the public and private sectors of the country's malnutrition problems. But lack of intersectoral collaboration and insufficient involvement of the vulnerable population groups were the main obstacles.

Five years later, in the fifth NESDP, a more comprehensive FNP was designed in the light of past experience, recognizing that malnutrition was primarily a consequence of poverty and ignorance. Specific nutritional interventions were implemented to provide immediate relief to those populations in need while long-term sustainable measures were gradually established. Supplementary feeding programmes in villages or schools, nutrition education campaigns, collection of nutritional status data, food fortification activities and human resource development activities were undertaken as specific nutritional interventions.

In addition, a Poverty Alleviation Plan (PAP) was implemented in the poorest areas of Thailand to improve living conditions. Agricultural production, creation of rural employment, provision of basic health services and development of village activities were the four main aspects of the programme. Local communities were deeply involved in the preparation and implementation process and this was one of the main reasons for the success of the programme. Strong political commitment was given at high levels, ensuring coordination of the agriculture, health and rural development sectors. In 1983, an indicator to measure the quality of life of rural people — Basic Minimum Needs (BMN) — was introduced to identify areas in need and actions required to improve living conditions.

All these activities (PAP, specific nutritional interventions and BMN) have resulted in significant improvements in living conditions and, consequently, in the nutritional status of the poorest and most vulnerable groups. Moderate and severe PEM have almost been eliminated and the prevalence of PEM among pre-school children has declined from 51 to 21 percent. A greater quantity and variety of foods are available for consumption, more cattle are being raised and health services now reach almost 80 percent of the targeted population.

The experience of Thailand demonstrates that awareness and political commitment are necessary conditions for the preparation of sound and sustainable programmes to overcome malnutrition. The involvement of the people in all steps of the process and intersectoral collaboration are two other indispensable conditions to ensure success during the preparation and implementation phases.

Source: K. Tontisirin. "Kiranondana public policy and implementation strategies for alleviation of malnutrition and poverty in Thailand". UNICEF, Florence, Italy, 1-3 March 1990.

Approaches to action

14. Effective action to improve nutrition will depend on the design and implementation of appropriate strategies and interventions. Regular monitoring of the policies and programme components, coupled with surveillance of the nutritional situation, will allow policy-makers to be informed of the extent of implementation and of the nutritional impact, enabling them to take immediate remedial action whenever necessary. This will require the development of mechanisms and procedures for addressing the multisectoral nature of nutritional problems. This does not mean that fully integrated policies, plans or programmes are required, but it does emphasize that many sectors have an important contribution to make in improving nutrition. These sectors should be given the mandate and the capability to act.

15. Putting the commitment to improve nutrition into practice at the national level will usually involve developing or refining policies and plans of action to address priority problems. Some countries are well advanced in this regard, having effective policies and programmes already in place or having identified areas for action through their preparations for the ICN. The aim of this policy orientation process should be to ensure that improved human welfare and nutritional well-being are made explicit objectives of overall national development policies and plans.

16. In practice, three complementary approaches to addressing nutritional problems are often required. First, *the commitment to promoting growth with equity* must be accompanied by the incorporation of nutritional objectives and considerations into relevant national, sectoral and integrated development plans and by the allocation of the human and financial resources required to achieve these objectives. This would also mean that each concerned ministry would need to review its programmes to evaluate their impact on nutrition and to develop feasible means to promote better nutrition within the scope of its activities.

17. Second, *nutritional interventions directed at particular problems or groups* need to be implemented. Priority problems need to be identified and practical programmes to address them developed. These could include, for example, actions to address specific problems of chronic food insecurity, child care and feeding, infections, disaster relief, etc. Such programmes should be targeted, affordable, manageable and well planned with activities, timetables and resources identified. Monitoring of programme implementation and impact is essential.

18. Third, *community-based actions encouraging local assessment of problems and implementation of appropriate measures* need to be developed. Such local involvement is essential if communities are to become self-reliant and able to identify and undertake lasting solutions to their nutritional problems. Such actions could be linked to ongoing development activities (for example, an agricultural extension programme or a community health programme) or be developed as a unique component of a district or area development plan.

19. In all three approaches adequate information for problem identification and monitoring of interventions is needed. A strong commitment by government to improving nutrition will be required to undertake such approaches successfully, and support from the wider development community may be needed. The following sections consider the roles and responsibilities of various sectors, public and private, in supporting these endeavours.

ROLE OF THE GOVERNMENT

20. Governments need to take a leading role in working toward solutions to nutritional problems, as they can have considerable impact on a population's nutritional status. For example, government interventions at the macro-economic level can affect the prices of food, the wages of workers and the availability and quality of services. Governments frequently provide agricultural services and health care and institute programmes that aim at protecting the nutritionally vulnerable, especially during emergencies. While taking direct responsibility for

SUGGESTED STEPS TOWARDS A NATIONAL APPROACH TO IMPROVE NUTRITION

- The extent and severity of nutritional problems should be assessed and their causes analysed.
- A common understanding of the determinants of nutritional status for various vulnerable and affected population groups should be elaborated on and agreed to by planners and nutritionists.
- Improvements in nutritional well-being should become explicit objectives of national and sectoral development policies and plans, programmes and projects.
- The ability to analyse the nutritional outcomes of development policies and programmes should be strengthened within relevant sectors.
- Relevant macro-level policies and development plans should be analysed for their potential effects on nutritional well-being, especially that of the most vulnerable population groups. The appropriate actions to enhance nutritional benefits should be identified and incorporated into various sectoral programmes.
- Technical capacities and appropriate mechanisms, at national and intermediate levels, for undertaking nutrition-relevant policy analysis and formulation, planning and operational activities should be strengthened or developed within sectors as needed.
- Specific programmes (or interventions) to improve food supplies and nutrition should be designed and implemented, particularly at district and community levels. Priority areas of action include enhancing household food security, preventing protein-energy deficiency in the most vulnerable groups and improving food quality and safety.
- Action for the prevention and control of specific nutrient deficiencies (iron, iodine, vitamin A) should be maintained and strengthened at each level.
- Diet-related non-communicable diseases should also be assessed and where they are a problem of public health significance, preventive action, mainly through consumer education, should be initiated or intensified.
- District- and national-level food and nutritional surveillance systems should be developed and strengthened for purposes of decision-making at each level.
- The ability to undertake systematic monitoring of programme activities and interventions in each of these areas and at each level should be developed.
- Concerted efforts to direct additional resources to those regions and population groups that have not benefited adequately from the overall social and economic development process should be made.

some aspects of nutrition, governments should also encourage and facilitate other institutions to act in other areas.

21. The extent to which governments take on various functions, or encourage other institutions – such as private business or NGOs – to do so, is determined by a wide range of factors, not the least of which is the resources at their disposal. However, as private social welfare organizations cannot reach many of those most seriously in need of special intervention programmes, governments need to intervene.

22. **Sectoral activities.** The main institutions in the public sector concerned with direct action on nutrition are the ministries of agriculture and food, health, education and social welfare. Others that have a significant impact are finance, economic planning and development, commerce and industries and local government. In some countries there is also a nutrition institute, carrying out research and training, and, less commonly, a national nutrition council or

comparable body, advising line ministries on how nutrition concerns could be reflected in plans, policies and projects. In all countries there is a need to ensure interministerial cooperation and coordination on nutritional matters through an effective coordinating committee.

23. The ministries of agriculture and health play a dominant role in improving nutrition and most have nutrition departments or units. Governments may consider, when necessary, broadening and strengthening the resources of these units as this is where expertise on nutrition is currently located. However, often the nutrition units of these ministries are not part of the mainstream of activities related to policy and programme planning, implementation and monitoring. This situation needs to be rectified. In addition, all concerned ministries, particularly those of economic planning and development, need to take a wide-ranging view of how their activities affect nutrition. This may require some professional reorientation and training.

24. Ministries could consider preparing a nutritional impact review of their policies, programmes or projects. This could be undertaken by drawing on available data and information and on the insights of experienced officers. In some countries the activities involved in preparing the country paper for the ICN have already laid the groundwork for such an exercise.

25. Within the health sector, more advantage could be taken of the opportunities offered by WHO's strategy "Health for all by the year 2000". The MCH services and PHC, especially community-based growth-monitoring promotion, offer good frameworks for carrying out nutritional activities. Immunization and diarrhoeal control are two elements that are channelled routinely through the health sector and have significant nutritional impact. Education in nutrition could also be more effectively integrated into these systems.

26. In agriculture there is a broad array of possibilities: expanding crop production efforts in neglected areas; encouraging the production of traditional crops; improving farming systems and crop yields; promoting employment-generating production programmes, especially for women; minimizing post-harvest losses; reducing problems of seasonal availability; putting food quality and safety laws into place; and building a capacity for food quality control. Rural development policies and programmes could also provide substantial nutritional benefits if they link health and agriculture.

27. The strengthening of public institutions to address nutritional problems should not be limited to government policy-making bodies. The capacity and competence of research institutes and university departments in the fields of agriculture, health, nutrition, communication and social science need to be raised. Developing the managerial capacity of service delivery systems is crucial.

28. Strengthening a public organization requires not only increased resources but also the strengthening of the capacity to operate. Human resource development through education and training with particular emphasis on operational problems and effective use of trained persons is crucial.

29. A significant proportion of development aid to agriculture and health ministries revolves around projects. However, care should be taken that project-related activities do not draw resources away from, and thereby weaken, existing institutions. Recent reviews of experiences suggest that projects can be used to strengthen existing infrastructure if objectives are modest, responsibilities are clearly defined, there is a high degree of participation by the beneficiaries and special attention is paid to the attitudes and motivation of staff. The success of the World Bank-financed Tamil Nadu Integrated Nutrition Project in India is in large measure due to the careful integration of project activities into existing institutions, to the low cost and to a narrow focus on a few well-integrated nutritional interventions that do not require extensive managerial skills. Costs are kept down because of the high degree of participation by the beneficiaries, allowing the project to become replicable and sustainable.

SUCCESS AND SUSTAINABILITY IN NUTRITION PROGRAMMES

A recent review of large-scale nutrition programmes has identified eight characteristics that make programmes both successful and sustainable. These characteristics — which are listed below — can be summarized in the following principles: be modest and clear about objectives; use information effectively; and, above all, pay special attention to "people management", encouraging and respecting project beneficiaries and staff.

Objectives should be achievable and time-bound. They should be established in the design of the programme and then determine implementation and evaluation. Project components should be limited, focusing on a few critical — and relevant — needs.

Community mobilization in design and implementation should identify needs experienced by the community and give people a sense of ownership of the components being delivered. There can be a range of devolution of decision-making, with some of the decisions still made centrally. Without some degree of local participation, time-consuming though it may be, the programme will not be sustainable.

Coverage in terms of the number of intended beneficiaries has to be weighed against the effectiveness of reaching those beneficiaries. This trade-off should be made explicit and be understood from the start.

Targeting methods are important but take time to evolve. They should be developed as the programme evolves.

Leadership and management mean effective administration and use of resources. Often it is the key component.

Training and supervision have been common to many successful projects and programmes. Retraining is always needed. Staff-to-client and supervision ratios need to be realistic.

Process monitoring and evaluation will ensure effective programming. Reappraisals should be based on monitoring with the flexibility to modify. Without monitoring and evaluation, although they are often difficult within a programme, ineffective programmes can continue.

Attitudes and staff motivation will be key in the running of the project (fostered by many of the elements mentioned above) and they are essential for the successful expansion of the programme.

Source: S. Gillespie and J. Mason. 1991. Nutrition-relevant actions: some experiences from the eighties and lessons for the nineties. *ACC/ISCN State-of-the-Art Series Paper No. 10.*

30. **Intersectoral cooperation.** Implementation of nutrition-related policies by ministries such as agriculture and health can be made more effective if there is intersectoral collaboration. Improving communication concerning nutrition within ministries can also lead to strengthened cooperation between ministries. This is particularly true regarding the ministries of agriculture and health, where nutrition is often the most common link between them.

31. Agriculture has an impact on health, not the least of which is through the provision of food and incomes. Decisions made by a ministry of agriculture on matters such as irrigation projects, pesticide management and nutrition will influence health. Because agricultural ministries influence food availability, incomes and consumption patterns in one delivery system and have a strong administrative structure, many opportunities exist for collaboration with other ministries concerned with nutrition, particularly health ministries. Practical nutritional planning in agriculture should seek primarily to influence who produces, what is produced and how the benefits of production and incomes are distributed to the nutritionally vulnerable.

32. A strong health sector can also contribute to improvements in agriculture. Healthier farmers and workers are more productive and less prone to accidents and injuries. Similarly, if a farm family is healthy and well-nourished, it is better able to take risks with new crops and farming methods. This is especially true of women farmers in developing countries, who often bear the main burden of food production and also the burdens of ill health associated with their reproductive functions. Other activities in which health and agriculture could usefully cooperate at the field level include community organization, extension and training activities, water and sanitation.

33. Very often such intersectoral cooperation may be difficult at the national level, but it becomes progressively more feasible at provincial and district levels. Some countries have advanced in decentralizing governmental responsibilities and this provides an excellent

opportunity for cooperation between sectors. For example, health, community development and agricultural extension workers, together with schoolteachers, could combine their efforts to address certain priority problems in selected vulnerable communities. It would be useful to start with an analysis of the nutritional impact of various ongoing district development activities as a way of ensuring that nutrition is integrated into grassroots development programmes.

34. In view of the great potential for interactions at a technical level between ministries of agriculture and health, and given the importance of these ministries' activities to improve poor peoples' nutrition, the intersectoral cooperation in most countries, whether developed or developing, could be further improved. With this objective in mind, each country needs to evaluate its own experiences and processes of intersectoral cooperation, with a view to strengthening them as necessary, in the light of its own specific needs and resources.

ROLE OF NON-GOVERNMENTAL ORGANIZATIONS (NGOS)

35. Both national and international non-governmental or non-profit-making organizations are very heterogeneous groups of organizations. They include community organizations of all kinds, consumers associations, trade unions, women's associations, farmers' groups and religious organizations, private universities, colleges and research institutions, professional associations of nutritionists, medical workers and food scientists, and international non-governmental relief and development organizations.

36. NGOs can be very effective at the grassroots level in developing countries. Their ability to target the poorest people in their programmes, the public support they receive, and their low-cost management style and highly motivated staff make them effective development agencies. NGOs work both to meet the needs of the poor and to assist them in articulating those needs. In both developed and developing countries, they also promote public awareness, playing a significant role directly in communities in many of the areas important for nutrition, most notably promoting measures to improve care, sanitation, PHC and the adoption of effective food security strategies. They can be very effective in introducing small-scale innovations that may become self-perpetuating and spread with modest inputs.

37. NGOs can increase the self-confidence of the poor, making them better able to participate in official programmes. One of their many roles is to explore alternative development strategies that encourage self-reliance, community participation and decentralized decision-making. In developed countries, consumer organizations and professional organizations (which may be better organized than in developing countries) can be a powerful force, providing an effective information and advocacy role and acting as a buffer to promote more effective dialogue and cooperation between government, academia, consumers and industry.

38. Consumer organizations can also initiate a dialogue with the food industry, the distribution system and market organizations so that, for example, these sectors can incorporate educational messages in their advertisements. Since they give information to consumers, they are also able to exert influence on the production of commodities and marketing organizations.

39. However, NGOs have their limitations. While many of them, such as Save the Children Fund, CARE and Oxfam, successfully operate large field programmes, most cannot compete with the multilateral and bilateral donors in implementing large-scale projects or funding policy-reform programmes. Issues of replication and wider impact become more significant with scarce resources. Another drawback is that they sometimes lack integration in the national system and function outside of it.

40. NGOs can derive benefits from enhancing exchanges and collaboration among themselves. They have now developed international and national networks that are exerting international pressure and influencing national policies on a wide range of issues, such as minimum wages, tenurial reform, equity and health, in order to raise access to food and improve nutritional status.

41. NGOs also play a very valuable role in meeting nutritional needs during emergencies, both natural and human-caused, by providing early warning, relief supplies and rehabilitation assistance.

ROLE OF PRIVATE ENTERPRISE

42. The role of private enterprise is important in bringing about nutritional improvement. In most countries, food and agriculture production is in the hands of private farmers, most of whom operate on a small-scale. Similarly, most of the food storage, processing and distribution is also run by the private sector. This sector also makes substantial contributions to good nutrition by encouraging small-scale industrial and service sector development in both rural and urban areas. Small-scale rural industries are important as a source of income, even for the poorest people, which gives important nutritional benefits. Sources of finance are often a problem, as the traditional banking structure requires assets for collateral. However, success with innovative forms of local development financing, such as through the Grameen Bank in Bangladesh and the Self-Employed Women's Association in India, suggests that there could be an effective partnership between credit agencies and private industry to reduce poverty.

43. The private sector can also contribute to maintaining or improving many determinants of good nutrition, such as the provision of nutritious and safe food, a healthy environment, healthy diets and health care. The contribution of private industries to research in nutrition and in food science and technology is also very significant. One good illustration of the role of private industry is in the field of fortification with micronutrients, for example, salt iodization, fortifying sugar with vitamin A as in Guatemala, vitamin D and iron fortification, and the reduction of salt and saturated fats in processed foods. These measures can be taken voluntarily or in response to legislation.

44. With increasing urbanization in developing countries, private industry will find larger markets in which to promote their food products as they take on the role of processing previously carried out by consumers themselves. For example, in most countries, in both urban and rural areas, much of the cereals consumed are now processed in mills rather than in the home.

45. Legislation regarding the quality and safety of food and its labelling, marketing and advertising is necessary and must be supported by an effective food control system. This is a responsibility of government, but some consumer groups have also become very effective in monitoring compliance. Cooperation and commitment are needed from industry to meet legal requirements and to assure the efficient operation of the food industry in all countries. Those opportunities where commercial interests and the good nutrition of consumers overlap should be identified and promoted by all parties. Governments should consider direct encouragement of such activities. Where there is divergence of interests, governments should consider taking action, such as expanding nutrition education activities and vigorously enforcing food quality and safety regulations and requirements for accurate and honest labelling and promotion of foods, so that there is no contradiction with government efforts to promote good nutrition. In developed countries, the food industry operates under strict controls relating to food quality and safety and hygiene, and it does so efficiently. In fact, industry quality control systems, from the farm level through processing and storage and marketing to the consumer, have been shown to be extremely effective in reducing food losses and ensuring basic food quality and safety.

46. Dialogue between all partners, namely government, consumers and private industry, is essential, and sustainable improvements can only be brought about by cooperation among them. Governments have a clear responsibility to share information with consumers and the food industry, and exchanges between consumers and industry also enhance the role of the private sector in reducing nutritional problems.

ROLE OF THE INTERNATIONAL COMMUNITY

47. Nutritional activities supported by UN agencies are wide-ranging: food production and agricultural development, food quality and control, food aid, health, population, environment, water and sanitation, child welfare, women's literacy and community development. Many UN agencies either address nutritional problems directly or have an impact on nutrition through their general activities. Among these agencies FAO, UNICEF, WHO and the World Bank have nutrition divisions or subdivisions, while many of the others have at least one full-time adviser.

48. FAO, the leading UN agency for food, agriculture and rural development, is charged with improving the level of nutrition throughout the world and helping to secure humanity's freedom from hunger. Accordingly, the nutrition-related activities of FAO are extensive and include support for virtually every aspect of the production, processing and marketing of food and agricultural products, as well as food standards, quality, safety, preparation and consumption. The organization is dedicated to promoting sustainable agricultural development and to improving the well-being of the poor and disadvantaged. FAO's efforts to improve nutrition through the development of agriculture, fisheries and forestry activities in the developing countries emphasize the following priorities: food security and early warning; strengthening food quality control systems; environmentally sustainable development; genetic resource conservation; agricultural data development; people's participation; and women in development.

49. Many of FAO's activities have an impact on nutrition, including: assessing and monitoring nutritional problems; developing appropriate policies and plans; implementing community-based programmes and projects; providing early warning of pending food emergencies; combating micronutrient deficiencies; incorporating nutrition into agriculture, fisheries and forestry projects; providing nutrition education and training; and ensuring the quality and safety of the food supply for consumption and export through strengthening of national food control systems. Many of FAO's activities specifically dealing with nutrition are advanced by the Food Policy and Nutrition Division in collaboration with other concerned technical divisions.

AID RESOURCE FLOW IN NUTRITION

Total bilateral and multilateral funding in the areas of food aid, population, water and sanitation, health, child welfare, women's literacy and community development, as well as nutritional projects, totalled US\$45 000 million in 1987 for recipient countries. The per caput estimation shows a considerable range: \$6.60 in South Asia, \$6.80 in Southeast Asia and China, \$15.50 in South America, \$21.80 in sub-Saharan Africa, \$29.80 in the Near East and North Africa and \$33.20 in Central America and the Caribbean.

The component directly related to nutrition was \$77.5 million, which translated into a per caput figure of \$0.02 (2 cents), varying from 5 cents in Africa to 1.5 cents in Southeast Asia and China and less than 1 cent in the Near East and North Africa. Exactly half of this came from the UN and its agencies, 38 per cent from bilateral donor agencies and the remainder from the World Bank.

Source: Estimate of external flows in relation to nutrition. ACC/SCN. 1991.

50. Data on food availability (dietary energy supply) are provided by FAO through its Food Balance Sheets. This information is analysed and presented in various periodic publications, such as the *State of Food and Agriculture, Agriculture: Toward 2000* and the *World Food Surveys*. While providing information on per caput food production and dietary energy supply, the *World Food Surveys* also estimate the number of people with inadequate access to food. FAO also produces *Nutrition Country Profiles*, summarizing the food and nutrition situation in the context of related factors such as agricultural production, economic development, demographic changes and access to services.

51. The Food Policy and Nutrition Division also supports the joint FAO/WHO Secretariat for the Codex Alimentarius Commission. The Codex Alimentarius Commission aims to protect domestic consumers and promote international trade in foodstuffs by formulating standards on food safety, pesticides, veterinary drug residues and contaminants; setting labelling requirements and standards for analysis and sampling; recommending uniform codes of hygienic handling requirements; and promoting mutual recognition of systems for food inspection and certification.

52. WHO's nutrition programme is mainly designed to strengthen the capacity of national institutions for: assessing nutrient- and diet-related problems, their main causes and contributing factors; developing and applying strategies for dealing with malnutrition, whether of deficiency or excess; and monitoring the programmes implemented and evaluating their impact. Toward these goals, the headquarters unit has developed global information systems and data banks on the major forms of malnutrition and is collaborating with the WHO regional offices and countries in developing these processes at the regional and country levels. At the country level, WHO seeks to help countries in developing effective health sector and intersectoral action plans for nutritional improvement. Particular attention is paid to nutritional surveillance and promoting growth monitoring, especially at the community level, to improving the nutrition of vulnerable groups and to programmes for overcoming micronutrient malnutrition. WHO also supports operational research and training programmes at local, national and regional levels, especially in the management of nutrition programmes. Currently, intensive programmes of action for nutritional improvement in eight of the neediest countries are being developed. At the global level, WHO's normative role includes the establishment of norms and guidelines in such areas as the epidemiological assessment and management of nutrition-related disorders and nutritional requirements. It monitors the implementation of the International Code of Marketing of Breastmilk Substitutes. WHO collaborates extensively with other UN, bilateral and non-governmental organizations at all levels, its closest partners globally being FAO and UNICEF.

53. UNICEF has been very successful in helping to meet the nutritional, social and health needs of children and mothers throughout the world, especially those in difficult circumstances. This has been accomplished through its support of a wide range of field-level programmes and projects, particularly those directed toward child care and feeding, breast-feeding promotion, immunizations, oral rehydration, growth monitoring, nutritional surveillance, maternal health and education. UNICEF has also been effective in advocating to the public and to policy-makers a "first call for children".

54. The World Bank has given increased attention in recent years to developing human resources and improving nutrition through its lending programmes. At present, approximately 13 percent of its investments go to the social sectors such as education, population, nutrition and health. In monetary terms it is the world's largest funding source for nutrition programmes and its potential for alleviating malnutrition is considerable. In addition to working to improve nutrition through social and economic development, the World Bank is also working with governments to address directly problems of food security, micronutrient deficiencies and child care and feeding.

55. The UN Development Programme (UNDP) also supports nutrition programmes through its mandate to assist developing countries to make the best possible use of their natural and human resources. This is achieved through the provision of technical and financial assistance in several sectors in cooperation with other specialized agencies and includes support for agricultural and rural development, nutritional interventions, social programmes to alleviate poverty, the creation of employment opportunities, the strengthening of food control systems and the improvement of the living environment. Many projects prepared by FAO, WHO and other agencies aiming at improving food security, nutrition, health and trade, are funded by UNDP. The potential benefit of including a nutritional impact assessment in UNDP-funded projects could be considerable.

56. The UN High Commissioner for Refugees (UNHCR), in providing international protection for refugees and material assistance to meet their needs and promote economic self-sufficiency, broadly promotes better nutrition among one of the world's most nutritionally vulnerable groups. In collaboration with the World Food Programme (WFP), guidelines for establishing rations and

choosing commodities for use in general food distributions and supplementary feeding programmes have recently been developed.

57. WFP, through its food aid programmes related to disaster relief, vulnerable group and school feeding programmes and food for work, contributes significantly to improving the health and nutritional status of people. Recognizing that nutritional benefits of food aid are far more effective when combined with financial, managerial and technical assistance, WFP has, where feasible, linked food aid to other inputs, including nutrition education, assistance to the health sector and such social development activities as training and credit opportunities.

58. Each of the UN agencies mentioned above along with others, including IFAD, ILO, UNESCO, UNFPR and UNU, participates in the Administrative Committee on Coordination's Sub-Committee on Nutrition (ACC/SCN), which provides a useful forum for discussing many nutritional issues and collects and disseminates nutrition-related information to agencies and professionals in the field.

59. The aggregate financial and technical contribution of bilateral organizations to general development programmes, including nutrition programmes, is substantial. Financial support is provided directly to the recipient country or through multilateral agencies. Several of these bilateral donors have nutrition advisers and some of these participate actively in the ACC/SCN.

RESEARCH NEEDS

60. Nutritional research is undertaken in many countries in all regions of the world. Both basic and applied nutritional research is undertaken on a large scale in many institutions in developed countries. Some of this fieldwork and laboratory research is carried out in developing countries, usually in collaboration with national institutions or governments. In these countries such research is often backed by national resources or international partners and is commonly of an applied or operational nature, including studies on how to manage within a given socio-cultural setting and on various types of nutritional problems and actions, especially at the community level. Operational research is often needed to better implement field programmes. Applied food science research is also commonly undertaken, although the resources available, including facilities and funds, are often inadequate. Researchers themselves are often not very well-trained or experienced in research protocol formulation or implementation. They often have to work in great isolation under extremely arduous conditions. Even with these constraints, networks of functioning research centres exist in each region. Valuable contributions that can improve nutrition are being made in each of these networks, but there is a need to disseminate and apply the findings more widely.

61. In agriculture, the Consultative Group on International Agricultural Research (CGIAR) supports 18 centres worldwide, with mandates that cover specific crops such as wheat, maize, rice and legumes, and specific geographic regions such as semi-arid regions, as well as policy research. Through agricultural research and related activities, the goal of CGIAR is to contribute to increasing sustainable food production, including agriculture, forestry and fisheries, in such a way that the nutritional level and general economic well-being of low-income people are improved. Working in partnership with national systems by providing assistance and advice in a priority setting, the CGIAR centres serve to bridge and fill gaps for national research systems, which are generally lacking in resources. In Asia, for example, research from the International Crops Research Institute for Semi-arid Tropics (ICRISAT) has combined with Indian national adaptive research to have a major impact on sorghum and pigeon pea production among poor farmers in neglected regions. In addition, the International Food Policy Research Institute (IFPRI) has focused on food consumption and nutrition as an important area of policy research and has successfully worked with governments and institutions worldwide in promoting more effective policies to improve nutrition among the poor.

62. However, nutrition research is often not a priority for ministries of either agriculture or health. In particular, nutrition-related health research has generally neglected the areas of applied

research, economic concerns, programme management and social communication. The Commission on Health Research for Development examined existing strategies to expand international health research and advised that resources be directed toward strengthening existing and new research centres in developing countries and linking these to an international network.

63. The United Nations University (UNU) programme has had considerable success in building research capacity in nutrition, although there has been an emphasis on basic rather than applied research. This programme has focused on the advanced training of key personnel in developing country institutions able to contribute to research, training and policy advice in nutrition. In addition, several university programmes offer short-term nutrition training programmes for mid-level management and administrative professionals from developing countries and, in many cases, oversee operational research programmes and projects.

HUMAN RESOURCE DEVELOPMENT NEEDS

64. Policy-makers and planners in various ministries need to be able to incorporate nutritional objectives into their policies and programmes and to collaborate in the formulation of national and intersectoral plans of action. They need to be able to evaluate information regarding the type and extent of different nutritional problems, understand the causes of the problems and how their ministry's activities may affect the situation and work effectively with other sectors to design and monitor appropriate courses of action.

65. To meet these needs, specialized education and training in matters related to food and nutrition is necessary. For nutrition scientists expected to work in areas of planning and programme management, this may require additional training in economics, communications and social sciences. Similarly, additional training may be required for professionals in other disciplines (agriculture, health, economics, etc.) who are expected to address nutrition issues. However, in both cases, such training needs to be relevant to the conditions in the country and should emphasize the practical application of the skills learned. Such training would be necessary both as pre-service and in-service training.

66. In addition to the specific technical training required, there is also a great need to strengthen managerial capacity at all levels. Practical training in programme planning and management, evaluation, proper use of information, supervision, budgeting and administration and in how to train may be needed. Currently such training is often lacking in most universities, nutrition institutes and technical schools.

67. Training and human resource development in the community are also essential. Such training could address a range of issues, including, for example: family care and feeding; growth monitoring; use of appropriate technology and improved food processing; and storage and handling. Training should be in response to communities' needs and should endeavour to increase their self-reliance.

68. Governments, supported in some instances by bilateral and multilateral agencies, have a particular responsibility for developing the technical, managerial and research capacity at all levels required to address nutritional problems in both the short and long terms. Cooperation among governments, donors and technical assistance agencies, the universities, the scientific community, NGOs and the private sector can be very effective in developing and strengthening the required training capacity. Development of regional and subregional education and training opportunities may be a cost-effective way to provide the training needed.

Concluding remarks

69. The task of meeting the nutrition challenge is formidable, but it is attainable provided there is a global commitment and concerted actions on the part of governments, local communities, NGOs, the private sector and the international community, including international organizations. A fundamental need in many cases is simply to focus the attention of planners and policy-makers on the need to make improvements in human welfare the primary objective of the development process.

70. This is not to suggest that economic development is not important, it is. It is now generally accepted that the essence of development should be to provide people, especially the poor and disadvantaged, with the social and economic environments necessary for them to lead healthy lives. To achieve this objective, development policies and planning should be better directed toward improving human development, and this includes improving nutritional well-being. What is required is a common commitment to allowing people the opportunities to improve themselves, while ensuring that the benefits of economic and social development are equitably distributed.

71. Given the diversity and complexity of problems that the developing countries are facing, global prescriptions for incorporating nutrition objectives into development policies and programmes are not likely to be effective. These have to be attuned to the specific needs, characteristics and priorities of different countries and regions. Moreover, time is needed to achieve the nutrition objectives, particularly when positive results require attitudinal and behavioural changes or involve groups that are difficult to reach.

72. Most of all, national initiatives and commitment of resources to formulate and implement national policies and programmes are essential for bringing about an effective improvement in the nutritional status of all, and particularly of the poor. Close cooperation between the government, local communities, NGOs and private industry is vital for the success of these programmes. However, in many cases, the resources needed are beyond the reach of many developing countries. The international community can make a critical contribution by providing financial and technical assistance to support national efforts. The international effort can help in supporting the process of equity-oriented development and in safeguarding the poor from the adverse impact of adjustment programmes, for example, in providing "safety nets", or from the shocks emanating from natural or human-made disasters. International organizations can also play a catalytic and vital role in supporting national efforts by providing assistance in areas of their competence. Financial and technical resources are essential if governments in the developing world are to be able to adopt and implement policies that incorporate nutrition well-being as the primary objective of development and bring food security and health within the reach of all.

Bibliography for Chapter 5

- Becker, W. & Helsing, E., eds.** 1991. *Food and health data: their use in nutrition policy-making*. WHO regional publications. European series no. 34. Copenhagen.
- Berg, A.** 1987. *Malnutrition: what can be done? Lessons from World Bank experience*. Baltimore, MD, The Johns Hopkins University Press for the World Bank.
- BIDANI.** 1989. *The Barangay integrated development approach to nutrition improvement of the rural poor: a nutrition-in-development action-research project*. College of Human Ecology. University of the Philippines at Los Baños College. Laguna.
- Commission on Health Research for Development.** 1990. *Health research: essential link to equity in development*. Oxford, Oxford University Press.
- FAO.** 1990. Balanced diet: a way to good nutrition. FAO Seventeenth Regional Conference for Europe, Venice. (ERC/90/4)
- FAO/WHO.** 1992. Incorporating nutrition objectives into development programmes and policies: theme no. 8. *Major issues for nutrition strategies*. International Conference on Nutrition, Rome.
- Field, J.O.** 1987. Multisectoral nutrition planning: a post mortem. *Food Policy*, 12(1): 15-28.
- Gillespie, S. & Mason, J.B.** 1991. *Nutrition-relevant actions: some experiences from the eighties and lessons for the nineties*. ACC/SCN State-of-the-art series. Nutrition policy discussion paper no. 10. Geneva.
- Gwatkin, D., Wilcox, J. & Wray, J.** 1980. *Can health and nutrition interventions make a difference?* ODC monograph no. 13. Washington, DC.
- Jennings, J., Gillespie, S., Mason, J.B., Lofli, M. & Scialfa, T., eds.** 1991. *Managing successful nutrition programmes*. ACC/SCN State-of-the-art series. Nutrition policy discussion paper no. 8. Geneva.
- Lipton, M. & De Kadt, E.** 1988. *Agriculture-health linkages*. Geneva, WHO.
- Lipton, M. & Longhurst, R.** 1989. *New seeds and poor people*. Baltimore, MD, Johns Hopkins University Press.
- WHO.** 1981. *International Code of Marketing of Breast Milk Substitutes*. Geneva.
- WHO.** 1986. *Intersectoral action for health: the role of intersectoral cooperation in national strategies for health for all*. Geneva.
- WHO.** 1991. *Food and nutrition policy in Europe*. Report on a WHO Conference. Copenhagen.

W/Z9550/E

