Nutritional status: indicators for action

Anthropometric measurements provide an excellent indication of the nutritional status of vulnerable groups and individuals. They are usually the central component of the nutritional surveillance systems that have evolved over the past 25 years. However, to provide a basis for action, they need to be complemented with other types of information on the reasons why people are underfed.

Improving the nutritional status of all people in all countries is one of the widely agreed objectives of many international conferences and summits held over the past 25 years. This objective is shared by the interagency FIVIMS initiative (see p. iii), established as part of the World Food Summit Plan of Action in 1996. It is known that an insufficient intake of calories (or undernourishment), as discussed in the preceding articles, is one of the primary causes of poor nutritional status and, often, of premature death. However, it is also widely recognized that poor nutritional status (or undernutrition) can also be caused by other factors, including a diet that is insufficiently diverse or deficient in critical micronutrients, and by poor health status, which renders the body unable to absorb or use calories and micronutrients.

As seen in previous issues of this publication, the nutritional status of individuals is most commonly evaluated through the use of anthropometry; that is, by taking body measurements, such as weight and height, which are then compared with averages for well-nourished people in the same age and sex classes. Anthropometric measures may be described as outcome indicators, in that they reflect the end result (in a person) of all the factors that affect nutritional status. There are more complex ways of evaluating nutritional status, particularly with regard to vitamin and mineral deficiencies, but these are generally more cumbersome to use on a broad scale in countries with limited medical facilities and other resources. Systems for collecting the anthropometric data and other information that are used to explain why nutritional status is good or bad, or has improved or deteriorated, are called nutritional surveillance systems.

Here we discuss the most commonly used indicators of nutritional status, including their application within nutritional surveillance systems and improvement programmes:

- At the national level, this information is used to assess the nutritional status of whole populations and how it is changing over time, as well as to channel intervention resources towards specific regions or areas.
- At the community or local level, the information is used to identify the reasons for the poor nutritional status of particular demographic or livelihood groups. Again, it is used to organize appropriate interventions, which may then be aimed at individual households or even individuals within households.

The discussion is supported by specific examples of the achievements made by country programmes that have applied these indicators.

What are the indicators of nutritional status?

Table 5 summarizes the most widely used anthropometric indicators in assessing the nutritional status of children and adults. These indicators all involve the direct measurement of a person's height and weight, followed by a comparison with what is normal or acceptable for their sex and age. The comparison is especially important in the case of children under five, since healthy children are still growing rapidly at this stage of their lives. These indicators of nutritional status have a number of advantages:

- they are a simple and practical way of describing the problem;
- they are useful proxies for a number of constraints to human welfare, such as inadequate access to food and/or the presence of infections and other environmental risks;
- they are strong predictors of the risk of subsequent morbidity, functional impairment and mortality, whether at the level of the individual, a group or a whole population;
- they are appropriate indicators for assessing the success or failure of interventions.

Nutritional surveillance systems vary greatly. Some systems use data collected by professional health workers in clinics; others use information gathered by community residents, specifically trained for this purpose. Some use sampling techniques designed to produce reliable national estimates; still others use more participatory survey techniques conducted at locations felt to be particularly representative, called sentinel sites. The weight/height anthropometric measures are almost always included because they provide very useful information at a relatively low cost. However, a variety of other indicators may be used, including market prices for food, indicators of agricultural production and other livelihood systems, and morbidity and mortality data. The one factor that surveillance systems have in common is that information is collected periodically in order to monitor trends.

Methods used at the national level

National governments and their international development partners need national estimates of nutritional status to identify regions exhibiting worse or better performances than others, to plan the allocation of resources as a consequence and to assess whether progress is being made in overcoming undernutrition.

Anthropometric indicators are incorporated into two basic types of surveillance systems used at the national level: those based on repeated large-

Table 5. Anthropometric indicators commonly used in nutritional surveillance systems

Anthropometric indicator	What it measures	Contexts in which it is used
Children		
Underweight	Underweight (low weight for age) represents both inadequate linear growth and poor body proportions caused by undernutrition	Underweight is the most common indicator collected in growth monitoring systems
Stunting	Stunting or "shortness" (low height for age) measures long-term growth faltering as a result of chronic undernutrition	Stunting is associated with poverty and may be assessed in stable situations to measure changes over time
Wasting	Wasting or "thinness" (low weight for height) as a result of acute undernutrition	Wasting is the indicator most commonly assessed in nutrition surveys in emergencies
Adults		
Body mass index[1]	"Thinness" (low weight for height) as a result of undernutrition	BMI is the indicator used to assess adult nutritional status. It is of particular importance where adults may be equally or more vulnerable to undernutrition than children, for example in emergencies
Low birth weight[2]	Babies are measured, but this indicator is associated with poor nutrition in mothers	Low birth weight is a useful indicator in stable situations, where it can be used to measure changes in maternal malnutrition over time. It is particularly important in Asian countries where maternal undernutrition is common
Elderly		
Body mass index	"Thinness" (low weight for height) as a result of undernutrition	Although there are problems with using the BMI to assess undernutrition in the elderly, it is very useful in emergencies

[1] BMI was covered in *The State of Food Insecurity in the World 2000*, p. 10-12.
[2] Unlike the other indicators, birth weight is measured only once.

scale sample surveys; and those based on the collection of statistics by social or health services.

Repeated large-scale surveys. These are designed to produce statistically representative averages at the country level. Health and related socio-economic conditions are assessed alongside nutritional status, as a basis for improving the planning and evaluation of sectoral investment programmes. In poorer countries with limited institutional capacity and budgetary resources, international agencies often provide assistance to governments in conducting these surveys. In the nutrition and health fields, two major international collaborative efforts of this kind are the Demographic and Health Survey programme, sponsored by the United States Agency for International Development (USAID) and the Multiple Indicator Cluster Survey programme, sponsored by the United Nations Children's Fund (UNICEF). In the socio-economics field, the nutritional status of household members is sometimes recorded in addition to other indicators, for example by the Living Standards Measurement Survey programme, sponsored by the World Bank in a large number of countries. The anthropometric indicators for different countries that were presented in *The State of Food Insecurity in the World 1999* came from this type of national survey. The latest compilation of these national data sets is available on the World Health Organization's Web site at www.who.int/nutgrowthdb/.

Administrative or service statistics. Data on anthropometric indicators are often collected in health clinics and schools. For example, babies taken to clinics are weighed and measured as part of routine growth monitoring or when they visit for specific treatments or vaccinations. These data are often sent to the national capital for processing and further use. Similarly, national school systems may require all students to have their age recorded and their height and weight measured. Clearly, if the use of formal health facilities is highly selective or if only a minority of children attends

school, then the resulting picture of national nutritional status will be severely biased. However, if the vast majority of the national population uses these basic services, then the resulting statistics, if carefully collected and analysed, can give a useful picture – as illustrated in the Box on Costa Rica and Panama.

Methods used at the community or local level

Direct measures to assess the nutritional status of populations are made at the community or local level, even when they are part of a national programme. Here we will focus on two methods using anthropometric and other indicators.

Repeated small-scale surveys. Small-scale surveys with a wide variety of content and a flexible approach can be used at the community or local level over time, both to define the initial dimensions of a problem and to monitor improvement as resources are brought to bear on it (see Box on Ethiopia). Constants in such surveys are the use of standard nutritional status indicators and the collection of additional information that is relevant to understanding both the immediate causes of poor nutritional status and the longer-term causes of the poverty that underlies it.

Growth monitoring. This is the continuous monitoring of the growth (weight and height for age) of children. It can be conducted by professionals in clinics run by the national health service or by trained members of the community in villages. The main objective is to assess the nutritional status of individual children and to mobilize local resources to support nutrition-related activities. Families with children at risk may be given a food supplement and/or nutrition counselling. Children are usually measured monthly.

Costa Rica and Panama: school census data for monitoring progress

Cost Rica began conducting school censuses in 1979 and completed its fifth census in 1989. The data collected showed that stunting had fallen by 45 percent by 1985. This decline is believed to be a valid indicator of improvements in quality of life and reductions in food insecurity in Costa Rica during this period. This contrasts with Panama, where the prevalence of stunting as measured through the school census increased from 19 to 24 percent between 1985 and 1988. This trend is thought to reflect the socio-political crisis and the internal rural-urban migration that was then taking place.

Source: *Food and Nutrition Bulletin*, 1991.

Ethiopia: repeated small-scale surveys help target food aid and assess the "impact" of interventions

Following three successive poor harvests in the North Omo zone of Ethiopia, in April 2000 Concern Worldwide conducted a nutrition survey. The prevalence of wasting was 25.6 percent, of which 4.3 percent was severe. In response, Concern provided therapeutic and supplementary feeding assistance, directed to vulnerable groups, as well as a general ration. Because seed supplies had been consumed, Concern also distributed seeds of key staple crops, including teff, sweet potato, wheat, maize and beans. In addition to identifying the acute need for intervention in specific areas, the survey results gave Concern the necessary information to highlight the whole region of Wolayita as one that required urgent attention. As a result, the region received priority status for food distribution by the World Food Programme (WFP).

A second survey was undertaken three months later. This identified a dramatic improvement in nutritional status (with a 6.4 percent prevalence of wasting and only 1 percent severe wasting). A third survey in October showed that the level of undernutrition had stabilized (with a 7.2 percent prevalence of wasting and 1 percent severe wasting). The improvement was attributed largely to the interventions. The stabilization of undernutrition and the imminent arrival of another harvest allowed Concern to phase out the general ration. The therapeutic feeding programme also stopped in October and supplementary feeding continued only until the large number of beneficiaries had reached their target weight.

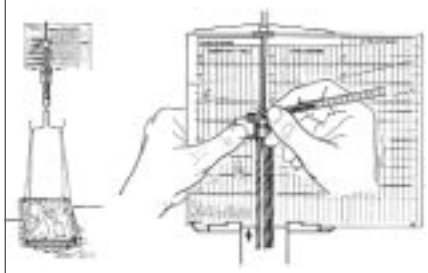
Source: Concern Worldwide, Ethiopia

Growth monitoring used to take place primarily in clinics, where mothers often had to queue, losing the productive time they needed for other tasks. Today, the availability of new types of direct recording scales allows growth monitoring to be carried out in other community locations, not just within clinics. The new scales are more robust and can remain in a central public place in the village, such as a school or village hall. In addition, they are directly connected to the growth chart, facilitating data entry (see Figure 6). Community health workers are well placed to make sure that the most disadvantaged mothers and children use them.

Community-based growth monitoring has been widely supported by UNICEF, international NGOs and, more recently, World Bank-funded nutrition programmes. An important element of this approach is that it empowers communities to act on the nutrition-related information that they themselves have gathered and interpreted. The approach can work very well when community nutrition promoters are properly trained and equipped with adequate resources. It can also provide a more comprehensive coverage of the under-five population compared with a clinic-based approach. The Box on Bangladesh describes a large-scale community-based growth monitoring system and highlights the importance of effective management of such a system.

These examples of the use of nutrition indicators show that, where there is political will and sufficient resources, local communities – working with decentralized government structures – can deal effectively with the immediate causes of poor nutritional status in vulnerable groups (factors such as inadequate energy intake and infections

Figure 6. The direct recording scale



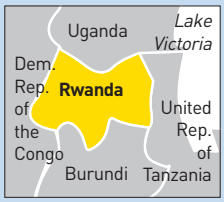
Source: M. Meegan, D. Morley and R. Brown. 1994. In *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 88: 635-637

Bangladesh: improving the quality of community-based growth monitoring

The National Nutrition Programme in Bangladesh includes a monitoring system designed to support decision-making. The system uses data "on the way up"; that is, at the various administrative levels (village, union and *upzila*) before the data are aggregated at the national level. Data on the monthly weight for age of children up to 24 months and on weight gain in pregnant women are collected by Community Nutrition Promoters, women from the community who are trained by contracted NGOs and supervised by community nutrition officers. The data are intended to trigger an appropriate response at each administrative level. For example, villages with more than 5 percent of children with severe undernutrition are identified for special follow-up action by the relevant community or government worker, to ensure that appropriate measures are taken. Also selected for follow-up are villages with less than 80 percent coverage in their growth monitoring or with less than 90 percent of eligible children and women receiving food supplements. The nutrition data are also used to assess the effectiveness of programme inputs. For example, it has been possible to assess the impact of a daily food supplement (equal to 600 kcal) targeted at pregnant women with a low body mass index (BMI). Following their receipt of the supplement, it was shown that these women had better pregnancy weight gain and birth weight of babies than did women with a higher BMI, belonging to higher income groups. As is common in undertakings of this kind, data reliability has been an area of concern in the programme. The problems include mechanical failure of the weighing scales, reading and recording inaccuracies and, in some instances, intentional misrepresentation of the data by community workers wanting to make their performance look better than it is. Having recognized these problems, the programme administrators are implementing quality checks that include "day after" reweighing, improving the quality and reliability of the weighing scales and increasing the level of supportive supervision of the Community Nutrition Promoters.

Source: Shoham, J., Watson, F. and Dolan, C. 2001. *The use of nutrition indicators in surveillance systems.* London, Overseas Development Institute.

Rwanda: monitoring the effectiveness of interventions in emergencies



When hundreds of thousands of Hutu refugees fled Rwanda following the genocide of 1994, four refugee camps were established in eastern Zaire (now the Democratic Republic of the Congo). Nutritional surveys carried out in the camps in August found severe levels of undernutrition (wasting) in 17 to 23 percent of children under five. The response was to supply a general ration of 2 100 kcal per person per day – which should have been adequate to restore a healthy nutritional status. However, repeat surveys conducted in October found that unacceptably high levels of wasting persisted in two of the camps.

The reasons for this became clear when additional data were collected through food basket monitoring, indicating the actual receipt of food aid rations at the household level. It was revealed that, in the two camps, 32 and 29 percent of families, respectively, were receiving less than 1 000 kcal per person per day. This inequitable distribution was strongly correlated with undernutrition, with female-headed households faring the worst.

These findings led to the conclusion that the method of ration distribution needed to be changed. Because of the overwhelming scale and speed of the influx of the refugees, international agencies had used the local administrative structures that existed back in Rwanda to facilitate food distribution. They had distributed food to heads of communes, who were then responsible for allocating rations to households. Commune leaders had favoured some households over others, usually for political reasons. The food basket data, in conjunction with the repeat survey data, helped the agencies lobby for a different distribution system, with food being delivered to smaller groups of households and eventually directly to individual households. After these changes, repeat survey results in December and January showed that levels of wasting had fallen to, and stabilized at, acceptably low rates (2.5 to 5 percent).

Source: J. Shoham, F. O'Reilly and J. Wallace. 2001. Humanitarian crisis and conflict: food assistance and nutritional security issue. *In* E. Clay and O. Stokke, eds. *Food aid and human security*, chap. 6. London, Frank Cass.

that reduce food intake and absorption). But how can these same groups go further and deal with the underlying or root causes of food insecurity? There is broad agreement that achieving this next step requires further local-level investigation into the viability and sustainability of the community's dominant livelihood systems (see the following section on vulnerability profiling in Guatemala).

Nutritional surveillance in emergencies

In general, the same methods of nutritional anthropometry are used in both emergency and ongoing situations. However, in emergencies there is more emphasis on the use of wasting (low weight for height) as an indicator, since the acute problems of access to food that typically occur at such times can lead to rapid loss of weight. There are also critical differences in how the work of nutritional surveillance is conducted, owing to the logistical and security complications typical of emergencies. The actors too may differ: where there is a partial or total breakdown of the government's ability to intervene to provide assistance (most often as a result of civil war), the major relief burden is picked up by international aid agencies rather than national programmes.

The guideline used by many relief organizations is that the emergency provision of blanket and targeted feeding begins when wasting exceeds 20 percent. Often, inadequate resources and lack of time make it impossible to use standard anthropometric indicators and to conduct a comprehensive survey of the population at risk during emergencies. In these circumstances, other, less accurate but more rapidly measured indicators are used, such as mid-upper arm circumference, while still applying a reasonably reliable sampling strategy to cover the population groups that can be reached.

Other, non-anthropometric indicators can also be used in nutritional surveillance in emergencies. The Box on Rwanda is an example of how complementary information collected in a refugee population helped identify inequity and correct the lack of accountability in a food distribution system.

Pathways to food security: options for the poor in Guatemala

Poverty is a key determinant of food insecurity. Finding out about the livelihood systems of poor people is an essential first step in identifying the options they have for improving their lot. The profiling of vulnerable groups is a useful way of doing this, as experience in Guatemala shows.

At the World Food Summit in Rome in 1996, leaders identified three key questions that need to be answered in order to guide action:

- Who are the food-insecure?
- Where are they located?
- Why are they food-insecure?

Vulnerable group profiling is a method developed by FAO to help countries find the answers to these questions. This method, which was described in detail in *The State of Food Insecurity in the World 2000*, is based on the assumption that food-insecure people are found within larger population groups that are exposed to various vulnerability factors, such as low income, insecure land tenure or a deteriorating natural resource base. Through the identification and characterization of homogeneous vulnerable groups, it is possible to determine, within each group, who the food-insecure are, where they are located and why they are food-insecure. It is also possible to identify the options open to different groups for improving their incomes and other aspects of their circumstances that contribute to food security.

This section presents information from a set of profiles that have been prepared for vulnerable groups in Guatemala, together with suggestions for new pathways that could lead these people out of vulnerability and into a better future.

The vulnerable groups

In Guatemala, vulnerability and food insecurity are predominantly rural phenomena. Roughly three-quarters of the population is rural, and nearly two-thirds of these people are vulnerable or food-insecure. In urban and peri-urban areas, the proportion of vulnerable people is about 10 percent; many in this category are new rural migrants seeking a better life.

Figure 7 shows the six vulnerable groups that have been identified in Guatemala and the proportion of the national population belonging to each. Four of the groups consist of small-scale farmers, distinguished from one another on the basis of differences in their agro-ecological environments and their patterns of labour migration. These four groups, together with artisanal fishermen on the Atlantic and Pacific coasts, comprise 45 percent of the national population. Temporary workers in Guatemala City and its periphery account for the other 2.5 percent of the population classified as vulnerable.

Each vulnerable group is found in a specific geographic region with specific agro-ecological conditions, production patterns and social structures. The maps in Figures 8, 9 and 10 indicate these regions, together with their population density and land morphology. The characteristics of each region contribute to the groups' vulnerability but also offer opportunities for change.

The national context

Based on a 1994 census, the population of Guatemala in the mid-1990s was approximately 8 million. Newly released data indicate that the number may now be more than 11 million. In addition to rapid natural population growth (2.5 percent per year in the period 1981-94), large numbers of people who had fled to neighbouring countries to escape civil conflict have been returning, particularly since the signing of peace accords in 1996.

A high proportion of the total population (42.8 percent) consists of indigenous peoples. These predominate in the mountainous western region, where they constitute about 70 percent of

Figure 7. Share of vulnerable groups in the national population

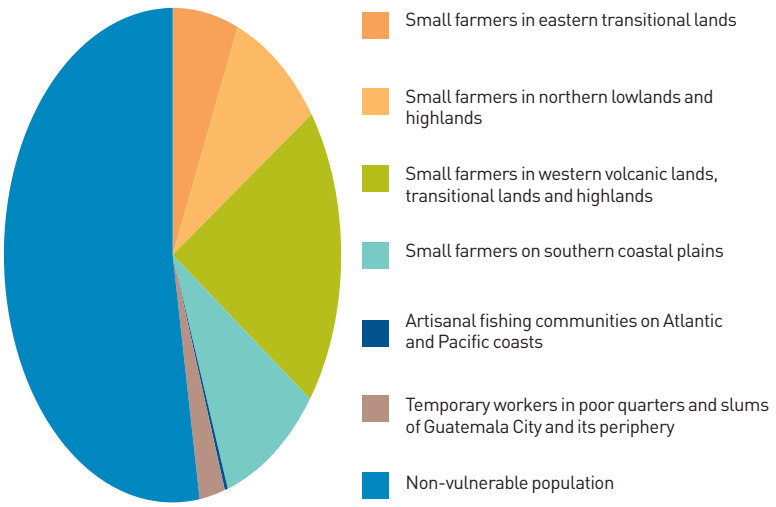
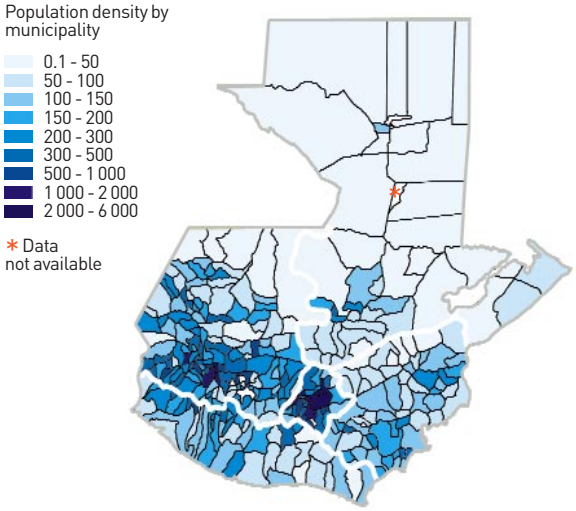


Figure 8. Geographical regions where vulnerable groups live

Figure 9. Population densities of geographical regions



the population. But pockets of indigenous peoples, growing maize on small plots of land and working artisanally or selling their labour, can be found in nearly all parts of the country.

Seasonal migration of small-scale farmers seeking work as agricultural labourers on large plantations has long been a characteristic livelihood system for many of Guatemala's rural poor. Now, other large-scale population movements are extending the agricultural frontier, often in unsustainable ways. In addition to obtaining land through official resettlement programmes, many people who were displaced by the conflict are now seeking to return to their original homes or finding new places to settle on their own. Economically marginalized people with no other options are also cutting down trees and opening up new land for maize cultivation, mainly at higher altitudes on the plateau and in the northern tropical rain forest of the Petén.

Maize cultivation is culturally as well as economically significant. Among indigenous peoples throughout Central America, maize represents regeneration and new life. Most men attach great importance to their role as maize growers and will go to great lengths to find a small plot of land on which to cultivate some maize, no matter what else they do to secure a livelihood for their families.

Figure 10. Land morphology of geographical regions

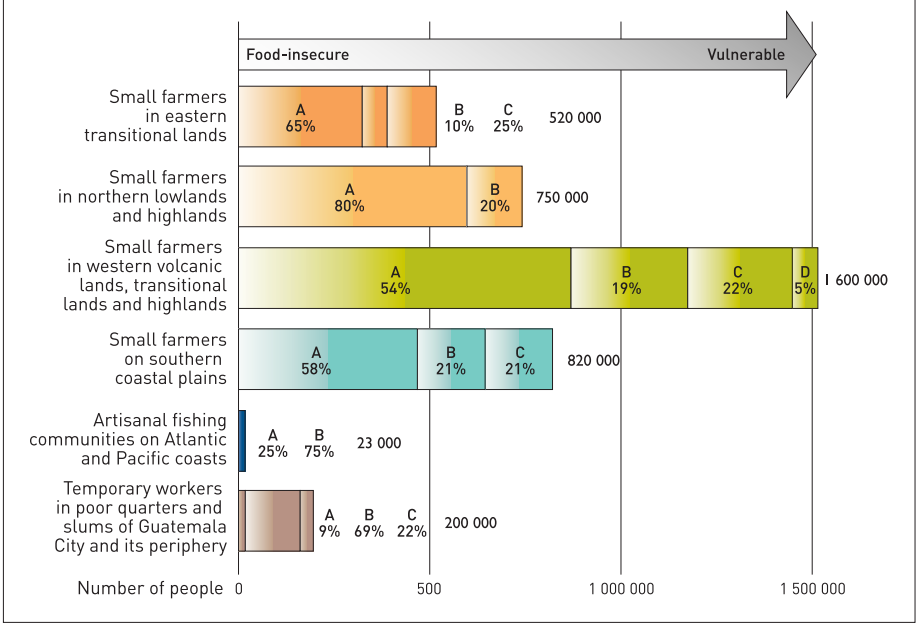
Typically, maize is cultivated on very small plots (*minifundia*), while commercial agriculture is practised on large plantations or estates (*latifundia*). Landownership of the *latifundia* is unambiguous, but small-scale farmers rarely own their land outright. Even those who have been granted title deeds cannot be sure that their land titles will be honoured in the courts. Many small plots are found on communal lands that are managed either by customary law or by the municipal authorities. Small-scale farmers may be given use rights on traditional communal lands, or they may rent from the municipality, or they may simply clear and cultivate unsettled land. Some practise sharecropping on land belonging to a large estate.

Illiteracy among rural men averages around 60 percent, while among women it is about 80 percent. This reflects a major difference in gender roles, whereby women are ascribed the role of "silent helper".

The profiles

The following pages profile the different vulnerable groups of food-insecure people in Guatemala. Within each group, homogeneous subgroups can be distinguished, some more food-insecure than others (see Figure 11). The profiles provide information about the geographical environments, dominant livelihood systems and main problems faced by these groups and subgroups. This characterization forms the basis for identifying opportunities to improve the livelihoods and food security of each subgroup.

Figure 11. Continuum of food insecurity and vulnerability within each vulnerable group



Small farmers in the eastern transitional lands

Geographical environment. The eastern transitional lands lie in the watershed of the Motagua River. At altitudes of 500 to 1 500 m, where most vulnerable small-scale farmers live, the climate is hot and dry and prone to frequent drought; soils are very poor.

Intensive export agriculture (bananas, coffee and horticulture) is practised on large estates on the lower slopes and nearby valley floors, which have ready access to the Atlantic. Construction is a growth industry in the expanding towns of the region.

Livelihood systems of vulnerable people. Small-scale farmers cultivate maize and beans for home consumption, combined with some fruits and vegetables for local markets, and they sell their labour to the large estates. Because of small plot size, low yields and very low wage rates for agricultural labour, these farmers often do not produce or earn enough to meet minimum basic needs.

Ten percent of the people in this subgroup are members of families with little or no land of their own and who cultivate communal lands or practise sharecropping at altitudes above 1 500 m (subgroup A). Sixty-five percent belong to families with less than 0.25 ha (4 *manzanas*) of land at altitudes below 1 500 m (subgroup B). Twenty-five percent are members of families without land, who migrate seasonally, renting land in the valleys or in the northern region for growing maize (subgroup C).

Opportunities. Much of this region is occupied by large estates, so obtaining access to additional land is not feasible for most small-scale farmers. Those in subgroup A have essentially the same options as those in the western zones (see relevant section on the next page). Choices open to farmers in subgroup B include:

- the introduction of agroforestry to improve yields and incomes from existing small plots;
- the introduction of small-scale irrigation in some locations to improve yields and allow the cultivation of an additional dry season crop.

To take advantage of these options, farmers need access to extension services, improved seeds or seedlings, better market information and credit. They also need to increase their bargaining power, possibly through the formation of farmers' associations.

Families in subgroup C can seek vocational training for the young to meet the growing demand for semi-skilled labour in the agro-export industries and for carpenters, woodcarvers, blacksmiths and mechanics. There are also opportunities for staff in domestic service.

Small farmers in the northern lowlands and highlands

Geographical environment. The northern lowlands consist of a largely virgin tropical rain forest (0 to 500 m), which accounts for nearly half the national territory; they are sparsely populated, with cattle ranching being the main

productive activity. The northern highlands form a much smaller forested perimeter (500 to 2 000 m) on the southern fringe of the region.

Large numbers of internally displaced and economically marginalized people, as well as post-conflict returnees, are now moving in. Many landless families from the eastern transitional lands also move north into this region for short periods to grow maize.

Livelihood systems of vulnerable people. New settlers and seasonal migrants practise slash-and-burn agriculture, cultivating the land for a year or two and then moving on. Owing to the fragility of the environment (steep slopes prone to erosion in the upper parts and low soil fertility in cleared rain forest areas), the sustainability of agriculture is at risk. In addition, the rapid advance of the agricultural frontier threatens the remaining forest, together with the biodiversity and ecosystems it sustains. Immigrants apply cultivation techniques from their regions of origin, which are not necessarily appropriate to the new environment, and they cut trees to sell as timber. The near total lack of land rights also encourages farmers to overexploit the resource base before moving on.

Twenty percent of this region's inhabitants belong to landless families now temporarily settled in either the lowlands or the highlands (subgroup A). Eighty percent belong to families with smallholdings who have claimed land but hold no legal title. Many families in both subgroups try to send at least one male family member to the capital city or to Mexico or the United States to find work (subgroup B).

Opportunities. Very important Mayan archaeological sites, combined with the natural beauty and biodiversity of the tropical rain forest, provide an opportunity to develop a major ecotourism industry, linked to the establishment of protected conservation areas. This would involve:

- investment in biodiversity conservation and management;
- the training of local groups to manage protected areas and service the tourist industry;
- the promotion of new regulations to protect the national forest.

Training in "conservation-by-use" of forest resources to generate additional income could provide immediate benefits to small farmers in both subgroups

Small farmers in the western volcanic lands, transitional lands and highlands

Geographical environment. The western volcanic lands, transitional lands and highlands constitute the plateau of Guatemala. Altitudes range from 500 to 4 000 m; roads are few and there is little access to basic social services. The region is densely populated, with very high rates of deforestation and consequent soil erosion on the steeper slopes.

Livelihood systems of vulnerable people. The higher altitudes of the plateau are inhabited mainly by indigenous people, who cultivate one or two crops of maize and beans each year during the rainy season and migrate to work on the sugar and coffee plantations in the south for the rest of the year. They also cut and sell timber as a source of supplementary income. In some locations wheat, potatoes and vegetables are also grown. Families with no other options are migrating to the northern region. As is the case in other areas, many try to send at least one family member to Mexico or the United States. At the lower altitudes, agriculture is more diverse, with greater opportunities for market participation.

Fifty-four percent of this region's people are members of families with little or no land in marginal areas with very steep slopes (subgroup A). Nineteen percent are members of families with less than 4 000 m^2 (1 to 10 *cuerdas*) on less steep slopes (subgroup B). High rates of illiteracy, very poor housing, poor hygiene and care practices, and cultural attitudes that favour maintaining the traditional maize-based livelihood system are common in these two subgroups. These people have a distrust of formal organizations, stemming from the period of conflict. However, indigenous leadership is influential and there is a strong NGO presence in many areas.

Twenty-two percent are members of families with 4 000 to 6 000 m^2 (10 to 15 *cuerdas*) and the opportunity to grow some crops for market (subgroup C). Five percent are members of families with diversified agricultural activities in the valleys and the skills required to find employment in the growing environmental protection services sector (subgroup D).

Opportunities. No agroforestry systems have yet been developed for adaptation to altitudes above 1 500 m – consequently, they are urgently needed. Other immediate possibilities for improving the lives of these highland peoples include:

- the introduction of improved post-harvest technologies for maize;
- the establishment of protected habitats for migratory bird species;
- investment in handicrafts production adapted to international market requirements;
- community-based ecotourism;
- training in conservation-by-use of forest resources;
- the introduction of shaded coffee and high-value spice trees.

Clear mountain spring water represents an important natural resource in the plateau and could be exploited through:

- the sale of water to downstream

municipalities, to industrial users and for hydropower;
- the development of micro or small-scale irrigation in suitable areas for the production of non-traditional fruits and vegetables for export.

Small farmers on the southern coastal plains

Geographical environment. The plains of the Southern Pacific coast, at 0 to 500 m, have generally good soils and flat terrain, with some undulating hills. There is a good road network and access by sea to markets in Mexico and Central America.

Agriculture is dominated by large estates and ranches producing for export, mainly sugar cane, banana and livestock on the plains and coffee in the hills. Throughout the region, small-scale farmers cultivate marginal land susceptible to flooding. Floods frequently cause substantial crop losses, especially of maize.

There has been a sharp reduction in the demand for agricultural labour because of the contraction of the coffee market and mechanization of the sugar estates. In addition, local small-scale farmers selling their labour face strong competition from migrants from the plateau.

Post-conflict returnees of indigenous origin have been resettled in organized communities under the "mixed cultural heritage" programme. Many of them prefer to grow maize, despite good opportunities to grow a wider range of crops. Local conflicts between settled farmers and returnees over access to land and government services are frequent.

Mangrove areas on the coast have been an important source of timber, but the resource is being increasingly overexploited.

Livelihood systems of vulnerable people. Fifty-eight percent of the inhabitants of this region belong to families without land and mainly depend on selling their labour to gain a livelihood; some also rent land to grow maize. These people may migrate to the capital, to the coffee and banana plantations in nearby departments or to Mexico or the United States in search of work (subgroup A). Twenty-one percent belong to families with one-sixteenth to one-quarter of a hectare (1 to 4 *manzanas*) of poor land producing maize for their own consumption and leaving their communities for short periods to work on the estates (subgroup B). A further 21 percent are families with one-sixteenth to one-quarter of a hectare (1 to 4 *manzanas*) of good land, producing maize and other crops for market; typically, at least one family member also sells agricultural labour locally from time to time. A large number of these families are resettled returnees (subgroup C).

Opportunities. Small-scale farmers in subgroup A could benefit from a livestock improvement programme to generate income. The programme should focus on small livestock, such as poultry, pigs and goats.

Options for small-scale farmers in subgroups B and C include:
- the introduction of irrigation technology to provide flood control and allow additional crops to be grown;
- the development of fruit crops that are in demand internationally: citrus, piña, mango, plantain, banana, guayaba, anona and guanaba.

Artisanal fishing communities on the Atlantic and Pacific coasts

Geographical environment. Artisanal fishing communities on the Atlantic coast live in conditions of physical isolation (settlements are located along a strip of sand dividing the ocean from the swamps). The habitat is extremely poor, with a total absence of basic services such as clean water, sanitation, health care, electricity, gas and transport. There are no organized groups or cooperatives.

The fish resource base in the Atlantic is declining as a result of the growing number of fishermen and the intensive extraction of the manjua plankton on which the fish feed. Artisanal fisheries in the eastern mangrove swamps are now part of a nature reserve. Because of restrictions on their rights to exploit wild foods in the mangrove reserve and lack of access to cultivable land, fishing families subsist almost entirely on the fish they catch; only a few own chickens or pigs.

On the Pacific coast, artisanal fishing communities coexist with settled agriculture and industrial fishing fleets. Various fish species of high commercial value are found in the Pacific, and the marketing infrastructure is well developed. Artisanal fishermen, who use boats with small engines, are at a disadvantage compared with their industrial counterparts, not only in terms of equipment but also because their access to services and markets is more limited.

Livelihood systems of vulnerable groups. In most artisanal fishing communities, a few of the "better off" community members own the boats and nets while most men work as crewmembers and receive a portion of the catch for consumption and local sale. Women are responsible for processing and selling fish on the local market, or – on the Pacific coast – to traders.

Twenty-five percent of artisanal fishing families belong to isolated communities with no access to land. They live on the Atlantic coast, mainly in the mangroves to the east but also north of Rio Dulce (subgroup A). Men in this subgroup fish with unmotorized dugout canoes and nets, while small children search for shrimp in the swamps. The catch is eaten or sold locally. The other 75 percent

belong to communities scattered along the Pacific coast, with access to small amounts of productive land and opportunities for seasonal work on ranches and estates (subgroup B). Many of the boats owned by this subgroup are motorized, and a substantial proportion of the catch is sold in larger markets along the coast.

Opportunities. Programmes targeted at the specific needs of artisanal fishing communities on the Pacific coast (subgroup B) can help them modernize. Possible actions include:

- a carefully designed microcredit programme that would allow groups to purchase engines and fishing equipment, including ice boxes for maintaining seafood quality;
- training in the use of simple tools and techniques for improving traditional practices used by women for fish cleaning, drying and salting, as well as for the preparation of fish and maize tortillas for the local market;
- the development of marine-based industries (prawns, tropical fish, and the production of fish flour for animal feed and glue).

For artisanal fishing communities on the Atlantic coast (subgroup A), opportunities include:

- the increased involvement of artisanal fishermen's families in conservation activities;
- the development of aquaculture (shrimps, mussels and tilapia);
- the training of young people for work in the mining and forest industries and in agro-export businesses.

Temporary workers in the poor quarters and slums of Guatemala City and its periphery

Geographical environment. Temporary workers in Guatemala City face considerable instability and risk. Although they have migrated from other regions to better their conditions, many remain irregularly employed. The slums and poor quarters where they find housing are unsanitary and subject to frequent flooding. Social safety nets are non-existent, with the exception of some targeted food aid programmes and the activities of religious organizations.

The degree of food insecurity of these irregularly employed workers generally reflects the length of their stay in the urban/peri-urban area. With time, their situation tends to improve, together with the quality of their homes, ownership status, income levels and stability and access to social and human capital. However, as long as their employment status remains uncertain, they remain vulnerable.

Livelihood systems of vulnerable groups. All family members work, including children. However, family income, generated through a number of diversified marginal activities, remains extremely low and uncertain; it is used almost entirely for house rental and the purchase of food. Children, often abandoned without care, are particularly vulnerable to food insecurity, disease and unscrupulous exploitation.

Nine percent of people in this subgroup belong to families headed by women with many children, often from different fathers. They usually live in new slums and are regarded as irresponsible, even disreputable. Not only do they suffer from unpredictable income but they are also subject to social discrimination and isolation which, in turn, aggravate their children's disadvantaged circumstances. Most of these families are extremely poor and chronically food-insecure (subgroup A).

Sixty-nine percent belong to families with a temporary worker renting a parcel of land or a tiny rudimentary house in more established poor quarters. An erratic income is generated mainly by the men, but it is quite often wasted on alcohol and drugs (subgroup B).

Twenty-two percent belong to families with at least one member engaging in more or less regular wage labour, usually settled in poor quarters but relying on a more stable family framework and lifestyle. However, food quality may be sacrificed in order to purchase a house on credit or pay for children's education (subgroup C).

Opportunities. Day care centres would create opportunities for women to work more regularly and would directly benefit vulnerable children in subgroups A and B.

Women and youth in all subgroups could benefit from:

- the development of the local containerized micromanufacturing industry;
- training in skills for urban jobs.

Recent shocks to food security

Droughts, floods, cyclones, extreme temperatures, earthquakes and conflicts continue to threaten progress towards food security in many developing countries.

These countries bear the brunt of the world's natural disasters and suffer disproportionately because they lack the means both to be prepared for them and to rebuild livelihoods in their wake. Governments that are already economically beleaguered must divert scarce resources to alleviate the effects of drought, floods or earthquakes, thereby thwarting their long-term efforts to improve food security and stimulate economic progress. When human conflict compounds the misery of natural calamity, advances towards freedom from hunger are further hindered.

From October 1999 to June 2001, 22 countries were affected by droughts, 17 experienced floods and hurricanes, 14 were involved in civil strife or war, 2 were hit by earthquakes and 3 endured exceptionally cold winters. Each disaster leaves a characteristic trail of damage in its wake, requiring a different response in each particular case. All too often, action taken has been too little and too late.

Drought conditions build up gradually, making it easier to predict consequent patterns of hardship; even so, early warning does not necessarily guarantee concerted or timely international action. Floods, cyclones, severe storms and, above all, earthquakes put the affected people at the mercy of spontaneous international reactions to their plight. Inhospitable climates cause hardship at the best of times, but when unexpected extremes of temperature occur, the results may be almost as severe as those from other disasters, placing great strain on fragile economies. Although relatively few new outbreaks of civil strife or war have occurred during the period under review, upsurges in long-standing civil wars continue to displace millions of people internally and to scatter hundreds of thousands across borders as refugees, despite the deployment of international peacekeeping forces.

Africa

A severe drought, which began in 1999 and continued into 2000, devastated crops and livestock across eastern Africa, leaving millions of people in desperate need of food assistance. In Ethiopia and Kenya, where large numbers of livestock were lost, people died of starvation, while Eritrea, Somalia, the Sudan, Uganda and the United Republic of Tanzania also felt the impact of the drought.

Despite early warnings from FAO's Global Information and Early Warning System (GIEWS), the international response to the impending food emergency was slow to begin, and mass starvation was only narrowly averted. In January 2001, the UN launched an interagency appeal for US$353 million to help the countries of the Horn of Africa recover from the effects of the drought but, as of April 2001, donors were still reluctant to respond. According to a UN regional humanitarian coordinator, the response for Kenya, one of the worst affected countries, produced only 3 percent of the requested amount by that time.

In southern Africa, unprecedented floods in February and March 2000 struck central and southern Mozambique, seriously damaging or destroying infrastructure and causing extensive crop and livestock losses. Again, international assistance was slow at first, but it later gathered pace, enabling the country to avert a major catastrophe. Although Mozambique is one of the poorest countries in the world, it had been making steady economic progress since the end of its civil war in 1992. Unless substantial international assistance is provided, the modest economic gains made in recent years will be reversed, and the hopes of achieving the goals set by the World Food Summit in 1996 will be dashed.

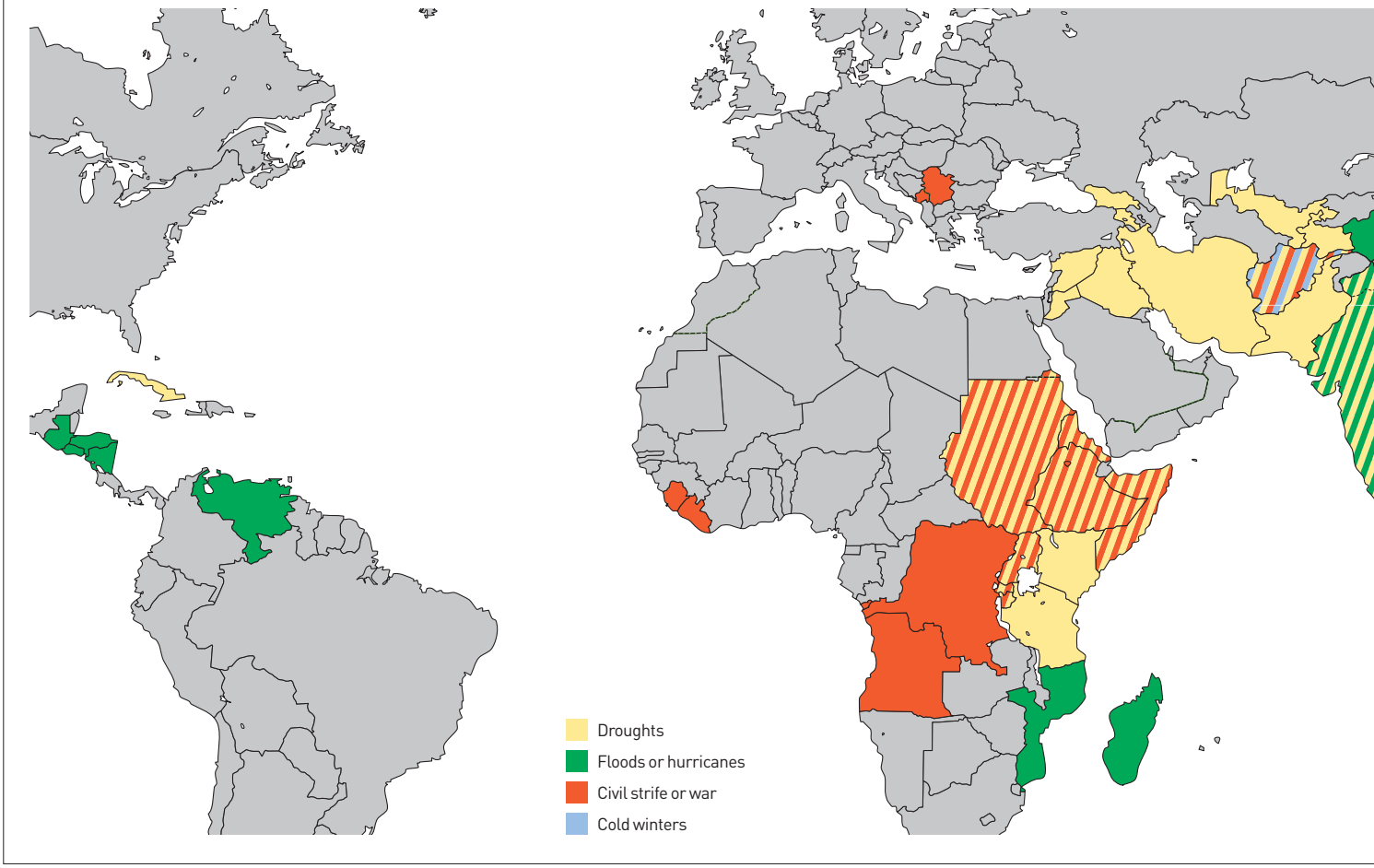
Two major cyclones and a tropical storm pounded Madagascar in early 2000, causing serious flooding and loss of life, the displacement of more than 10 000 people and extensive damage to the country's infrastructure. In all, 1.14 million ha of crops were affected, with an estimated 200 000 ha totally lost to floods. In addition to heavy losses in food crops, major export crops of coffee, vanilla and cloves were severely damaged. Madagascar, like Mozambique, is a poor country that had been making some progress in recent years as a result of economic reforms.

To add to the sum of misery, conflicts and their aftermath, protracted civil wars in particular have continued to cause suffering for millions of people in Africa. In Sierra Leone, despite the deployment of a UN peacekeeping force, the displacement of rural people continues. Up to 1.2 million internally displaced people in rebel-controlled areas were beyond the reach of humanitarian agencies in late 2000, and their nutrition and health status is cause for great concern. For some time, Sierra Leone has been heavily dependent on international food aid owing to the constant disruption of domestic food production activities.

In Angola, an escalation of the 25-year civil war has resulted in the displacement of more than 2.7 million people, the majority of them suffering from malnutrition and disease. A similar situation prevails in the Democratic Republic of the Congo. According to UN statistics, at least one-third of the country's population or 16 million people, are malnourished, largely because of constant population displacements. Elsewhere in sub-Saharan Africa, fighting continues in Burundi, Liberia, the Sudan and Uganda.

Landmines have also become a serious threat to life for rural

Figure 12. Countries recently affected by natural and human-induced disasters



communities, both during and after conflicts. In Eritrea, for example, many of the 1.5 million people displaced from the best farmland in the country by the war with neighbouring Ethiopia are reluctant to return to their home areas for fear of being killed by landmines.

Asia

In Central Asia, a total of 4 million people in the countries worst affected by drought – Armenia, Georgia and Tajikistan – now require assistance. The drought has also affected Jordan, Iraq and the Syrian Arab Republic for two consecutive years; small-scale farmers and herders have been particularly severely hit and are in urgent need of food aid.

In Afghanistan, the drought decimated crops and livestock across the country, and deaths from starvation were reported. The situation has been aggravated by the escalation in the long-running civil war and an extremely harsh winter, with people moving in masses from rural areas to the cities and across borders in search of food and shelter. There have been reports of deaths caused by the freezing temperatures, especially in western and northern areas.

In the Islamic Republic of Iran, the drought in 2000 was a continuation of one of the worst droughts in 30 years, severely affecting 18 of the country's 28 provinces. The country had to import almost 7 million tonnes of wheat in 1999/00, making it one of the world's biggest wheat importers. In Pakistan, the drought devastated crops in the western province of Baluchistan and the southern province of Sindh. In India, the worst drought in 100 years hit the State of Gujarat, leaving more than 18 000 villages with serious water shortages. Other states affected

include Rajasthan, Madhya Pradesh and Andhra Pradesh.

Bangladesh, Cambodia, China, India, the Lao People's Democratic Republic, Nepal, Thailand and Viet Nam were among the countries to suffer from the effects of such disasters as floods, cyclones, tropical storms and earthquakes. In Cambodia, another of the world's poorest countries, the worst floods in 40 years resulted in several hundred deaths and large-scale destruction of crops, infrastructure, property and lines of communication. In India, the worst affected country, severe floods devastated the States of Himachal Pradesh, Bihar, West Bengal and Assam. Also in India, the State of Gujarat suffered an earthquake that caused tens of thousands of deaths.

In Mongolia, two consecutive (1999/00 and 2000/01) winters of extreme cold, with temperatures falling as low as -50°C, destroyed 3.6 million head of livestock, more than 10 percent of the national herd. Over one-third of the country's population, mainly nomadic herders, rely entirely on livestock for their livelihood and income. A large proportion of the population has, therefore, become impoverished and highly food-insecure and will remain so for several years until their herds are fully rebuilt.

Temperatures in January 2001 fell to their lowest levels in 50 years in the Democratic People's Republic of Korea, exacerbating the precarious situation of people already weakened by years of food scarcities, shortages of electricity and fuel for heating and limited access to health services.

Numbers of people affected by disasters

Worldwide, the numbers of people estimated to be affected by food shortages as a result of disasters have varied from 52 million in October 1999 to 62 million in October 2000 and 60 million in April 2001.

Latin America

In Central America, crop production was seriously affected by a string of natural disasters, including a prolonged dry spell, hurricane Keith and earthquakes. El Salvador suffered a succession of earthquakes in January and February 2001, which killed more than 1 000 people and caused extensive damage to housing and communications infrastructure. Although major food crops had been harvested, the vital coffee sector was seriously affected.

In South America, heavy rains and drought forced the Government of Bolivia to declare most of the country a disaster area in February 2001, prompting food assistance from the international community.

Long-term strategies needed

Predictive models of climate change support the impression of an increase in the incidence, intensity and geographic spread of droughts and floods. As demonstrated above, some of the world's lowest-income countries are the most severely affected.

Timely international assistance can often avert mass starvation and help mitigate the worst economic effects. Beyond such emergency relief, further assistance is needed for rehabilitation and reconstruction. However, if these disasters are on the increase, as the international scientific community believes, then long-term strategies are essential to help countries adapt to them in the short term and to reverse the trend towards global warming over the medium to long term. In addition to the reduction of greenhouse gas emissions, the preventive measures needed include reforestation, soil and water conservation (at the watershed level) and the adoption of drought-tolerant crops. Safety nets for the worst affected regions and strong early warning systems are also important.

HIV/AIDS: a crisis like no other

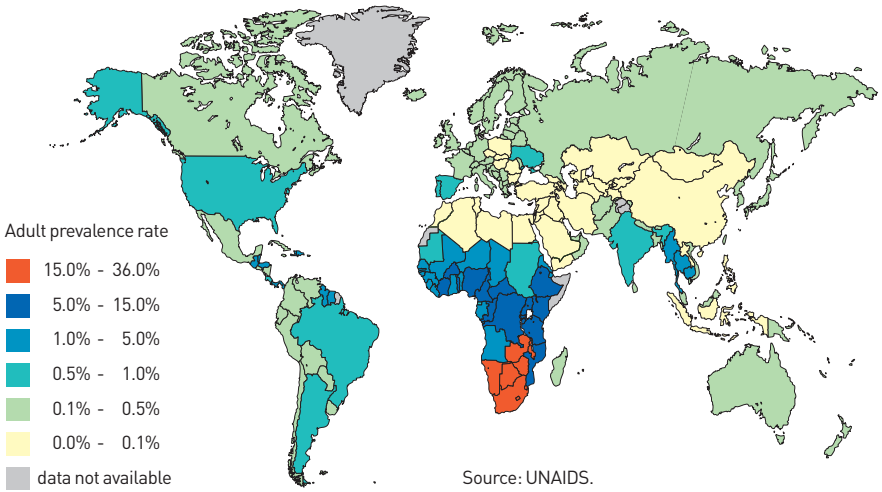
While the HIV/AIDS epidemic is still essentially perceived and dealt with as a health issue, for millions of households and entire communities and regions devastated by disease and death, access to food has become a major priority.

It is currently estimated that some 36 million people worldwide are infected with the human immunodeficiency virus (HIV), 95 percent of whom live in developing countries. Assuming that each case of HIV directly influences the lives of four other individuals, a total of more than 150 million people are already affected by the disease. There were 5.3 million new HIV infections worldwide during 2000, when nearly 3 million people died as a result of acquired immunodeficiency syndrome (AIDS). Tragically, the prevalence of the disease is still increasing. India and South Africa, each with more than 4 million people infected, have the largest populations living with HIV/AIDS. Regionally, the magnitude of the epidemic is greatest in sub-Saharan Africa, where more than 25 million people live with HIV/AIDS. Biological and social factors make females more vulnerable than males, especially in adolescence and youth. In many places, HIV infection rates are three to five times higher among young women than in young men.

The epidemic is advancing with frightening speed. Southern Africa, where the disease is most prevalent, gives a taste of things to come for other regions unless effective preventive action is taken. In Botswana, for example, in 1984 less than 1 percent of adults were infected but, by 2000, the prevalence rate had soared to 35 percent.

The disease commonly strikes the most productive members of society, with critical effects on agriculture as well as on all other aspects of economic and social development. Both rich and poor may succumb, but the poor are more vulnerable to its effects. HIV/AIDS prolongs and deepens poverty over time, stripping households of their assets and depleting human and social capital. These characteristics mean that the disease simultaneously undermines both the production of food and economic access to it – dealing a double blow to food security.

Figure 13. Estimated number of people living with HIV/AIDS worldwide, 1999



The impact on food security and nutrition

The effects on food security and nutrition are felt:

... At the household level. Classically, a downward spiral in the welfare of an HIV/AIDS-affected household's welfare begins as soon as the first adult falls sick. This results in less ability to carry out work on food production and processing, and increased time and money spent on health care, with further negative effects on food-related activities. Children may be forced to discontinue their schooling because the household needs their help and can no longer afford school fees. When the first adult dies, additional expenditures are incurred for the funeral and the productive capacity of the household is permanently impaired. Socio-cultural practices may further aggravate the household's problems, for example when a surviving wife cannot maintain access to the land of her deceased husband. A driving force behind the spread of AIDS, such forms of gender inequality can lead to a greater degree of deprivation among women in AIDS-affected societies.

In the next stage, the partner of the first adult may become sick, problems intensify and accumulate and the downward spiral accelerates. The household may find itself without cash reserves; often it becomes indebted and is forced to sell livestock and other productive resources. The household slides into destitution. Traditional systems of mutual support become exhausted, with relatives unable to care for the children of parents who have died. Eventually, the household is reduced to impoverished elderly people and children.

For a poor person infected with HIV/AIDS, malnutrition and disease form

a vicious circle. An inadequate diet increases the risk of secondary infections and hastens the progression of HIV/AIDS. This in turn results in a further deterioration of nutritional status. In contrast, the healthier and more balanced diets typically enjoyed by wealthier people help them to resist the disease and maintain a certain quality of life. After HIV infection, the onset of AIDS and of secondary infections is delayed in individuals with a good nutritional status.

... At the community level. There are several ways in which HIV/AIDS affects agriculture and food production at the community level. The first and most obvious is the toll on the labour force. FAO estimates that, in the 25 most affected countries in Africa, 7 million agricultural workers have died of AIDS since 1985 and 16 million more deaths are likely in the next two decades. The labour force is expected to shrink by 10 to 26 percent in the ten countries with the most serious epidemics.

Commercial farming is just as badly affected as small-scale subsistence-based farming, since migrant workers are particularly prone to infection. Crucial labour for weeding and harvesting may become scarce. The morbidity and mortality of employees increase the social and health costs incurred by the business, which may lose skilled and experienced workers. The decline in productivity and competitiveness may result in decreased employment opportunities and severe knock-on effects for other local businesses, such as input suppliers.

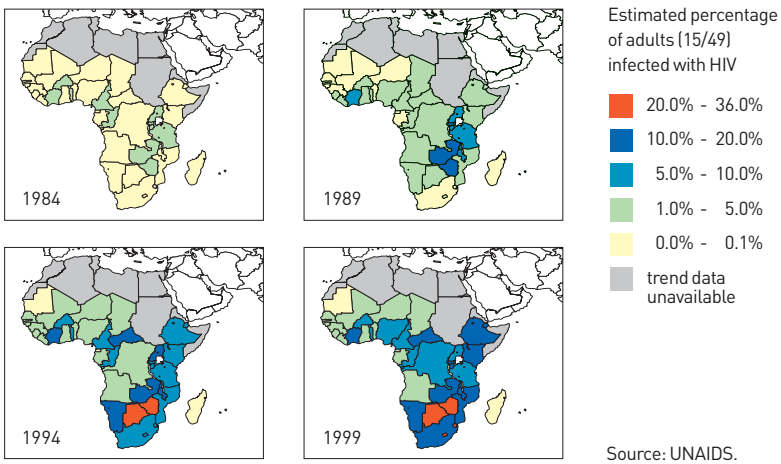
Just as food producers and processors are affected, so also are the institutions that support them. Agricultural research and extension services, like those for health and education, are disrupted as staff fall ill and die. Provision of care to sick family members, attendance at funerals and the observation of mourning periods further reduce the productive time of the remaining staff.

When many households in a community are affected by HIV/AIDS, traditional safety mechanisms for the care of orphans, the elderly, the infirm and the very poor are overwhelmed and may well collapse altogether. People have no time or money left to devote to community organizations. The widespread loss of active adults disrupts mechanisms for transferring knowledge, values and beliefs from one generation to the next. Agricultural skills disappear because children are unable to observe their parents working. In Kenya, for example, only 7 percent of households headed by orphans are reported to have an adequate knowledge of agricultural practices. All these problems can inflict lasting damage on the community's ability to produce and buy food.

... At the national level. Household and local impacts build up progressively, so that the life of the entire nation is affected. Key decision-makers and highly skilled professionals at the national level are lost. In countries with high prevalence rates, many central government departments are no longer able to provide services as planned. The increased burden on government health budgets diverts funds away from productive investments, such as agricultural services, inputs and credit.

National food supplies decline, leading to a rise in food prices which hits poor people the hardest. The breakdown of commercial enterprises may undermine the country's capacity to export and hence to generate foreign exchange earnings and jobs – with a further impact on access to food among the poor.

Figure 14. The spread of HIV/AIDS in Africa, 1984-99



Source: UNAIDS.

Urgent action needed

HIV/AIDS represents a daunting humanitarian and development challenge. Yet experience from several countries shows that this challenge can be met and that the epidemic can be stemmed. For example, in Uganda the infection peaked during the early 1990s, with an estimated 15 percent of the population affected. Ten years later, levels of infection have been halved following the adoption of a strategy of prevention that benefited from a high

degree of political commitment and broad public participation. Similarly, projected infection rates in Thailand for 2000 have fallen to 0.9 million from the level of 1.4 million projected in 1994. These successes show that society is not powerless to turn the epidemic around and that some countries have lessons to teach about the approaches and solutions that work. Dealing with the epidemic requires an integrated approach, combining prevention and mitigation strategies:

- The starting point is strong advocacy, geared to raising the awareness of policy-makers, civil servants, professionals, opinion leaders and the general public. Society at large must acknowledge the HIV/AIDS problem and accept responsibility for addressing it. Dynamic leadership and political commitment at all levels are imperative.
- Participatory programmes that simultaneously address the food, health and care issues associated with HIV/AIDS are needed to help affected communities cope with the epidemic. Such programmes

A narrow escape

Mulenga grew up in a small rural town in Zambia. Her father was a shopkeeper selling inputs to farmers in the nearby villages. Her mother worked as a nurse in the district hospital. Mulenga's parents were not married, but they had lived together for some years. When her mother was transferred to a hospital several hundred kilometres away, their relationship came under pressure and, after a while, they split up. As time passed, both parents went through a series of more casual relationships. This was in the late 1980s, when people had not yet heard about HIV. Mulenga was still small and, when her mother had left, she stayed with her father, who looked after her as best he could.

Mulenga was bright and did well at school. When she was about 13, her father, with the meagre income he made from the shop, managed to send her to secondary school. This was about the time when his health started failing. He became thin and was often ill. Mulenga's mother had also not been well for some time, but Mulenga was unable to see her regularly as it was too expensive for her to travel. Especially now that her father's health prevented him from working, it became more and more difficult for them to make ends meet and soon school fees were beyond reach. Not long after her 14th birthday, Mulenga's mother died. She was devastated by the news. So was her father, who started spending the little money they had left on drink. He realized that what was happening to him was the same as had happened to Mulenga's mother.

Hardly a year after Mulenga's mother had died, her father also died of AIDS. Alcohol had quickly worsened his condition. He had lost his appetite and fallen very ill. As he could not work any longer, he had been forced to close the shop and sell the building.

Mulenga was now on her own. At the age of 15, she was considered grown up by local standards and was supposed to be able to look after herself. Her father's relatives had come to the funeral and had taken all his possessions. She was left with nothing, apart from a promise that she could stay for a while in a small shack in the back of the yard of one of her father's friends. How to make ends meet was her daily worry. When her father had become very ill and unable to get out of bed anymore, she had stopped school entirely to look after him. To get by, she was now doing odd jobs, but her lack of education meant there were few good opportunities. Men would ask Mulenga out for a drink and she would agree, hoping to earn a place in their favour and so get a job. But young and inexperienced as she was, she would be lured into sleeping with them. She knew about the risk of contracting HIV, but had lost all hope and felt powerless to change what was happening to her. She could see no other way of making ends meet.

Times were hard for everybody and when Mulenga realized that finding a steady job was unlikely, she started going out with travellers who were staying in town and whom she would meet at night in local bars. She would sleep with them and get a little money in exchange. Older girls had told her about how they had travelled to the capital where there was much more money to be had. But she could see that, although they had come back with money, they were not looking well.

Searching for a glimmer of hope, Mulenga joined a youth group which received support from a local development organization. The group members met every week and talked about their lives, their problems and their hopes. There she heard the stories of other people who had gone through similar troubles. From their discussions, she learned that there were other ways of coping and she decided to enrol in a training course that was offered to the group. Once she had graduated, she planned to apply for a small loan to re-establish the shop her father had run. Since the shop had closed, the farmers from the surrounding villages had had to spend more time and money travelling to the next town to find the inputs they needed. Some had even abandoned their plots. Through the youth group, Mulenga had seen an opportunity to start her life anew.

need to target men and women, old and young, in ways that respond to their particular needs both for information and assistance. They may also provide opportunities to initiate discussion in areas where HIV/AIDS is stigmatized.

- HIV/AIDS considerations need to be mainstreamed in agricultural and development policies and programmes, which must consider ways of preventing the spread of the disease and mitigating its effects.

What information is needed to combat HIV/AIDS-related food insecurity?

Combating the food insecurity associated with HIV/AIDS must be based on a good understanding of both the factors that contribute to the spread of the disease and the impacts resulting from it. To guide decisions on where, when and how to intervene to meet these two intertwined objectives, basic information is needed on:

- patterns of spread in affected communities;
- clear identification of groups most at risk of infection;
- impact on the nutritional status and livelihoods of affected populations;
- the types of intervention that are both feasible and cost-effective.

For families, the immediate impact of HIV/AIDS is on the health and nutritional status of the individual infected. A second stage of impact concerns the ability of the affected household to produce and/or buy food under conditions of reduced labour or income, and a greater demand for resources for health care and social support.

Assessing the spread of the epidemic. Understanding the magnitude of the epidemic in affected communities requires information on the spread of the disease. The health sector clearly plays a leading role in generating this information. Both the formal health sector and traditional community care systems can be good sources for key prevalence indicators, including attendance rates of patients at health centres and overall mortality and morbidity rates for associated conditions, such as wasting, diarrhoea, tuberculosis and pneumonia.

Identification of groups most at risk of infection. A good understanding of the social epidemiology of the disease – who becomes infected and why – is important in designing measures to reduce the spread of the epidemic. The local community and its partners must understand the roles played by at-risk groups such as: i) migrant workers who spend long periods away from their home and family; ii) workers and tourists who travel widely; iii) teenage girls and young women with little or no means of support; and iv) those who work as prostitutes or use their services. Given the obvious gender issues above, information on the status of women and on their ability to access economic resources, information and reproductive health services is also essential. Similarly, fighting the epidemic also requires frank approaches to understanding and dealing with delicate issues such as sexual attitudes and practices, including, for example, the use of condoms.

Understanding and monitoring impacts on nutritional status and livelihoods. The impact of the epidemic on nutrition and food security depends on how affected communities and households secure their livelihoods and the coping strategies they employ to deal with the economic and care aspects of HIV/AIDS. For monitoring, information is needed on: i) main livelihood systems (especially labour force and agricultural productivity issues) and coping mechanisms; ii) the capacity of governmental and other local institutions (including NGOs and traditional healers) to provide services; iii) demographic changes (such as dependency rates, gender balance); and iv) all the above seen within the dynamics of specific community or livelihood groups. Participatory assessments can help identify impacts on food availability and access, incomes, care and feeding practices, and on nutritional status. Community-based food and nutrition information systems can provide a basis for raising awareness and for planning, monitoring and evaluating interventions. Information to assess and monitor the cumulative impact on food supplies and economies will also be needed.

Feasible and cost-effective interventions. The monitoring and evaluation of HIV/AIDS interventions are essential. Stakeholders at all levels must receive the results in order to make informed decisions on the often cruel choices between care for the sick and dying and the support needed to end the disease spread and provide for survivors.

Information needs concerning the HIV/AIDS epidemic should be related to interventions to mitigate its spread and to alleviate the negative impacts on its victims. Information systems should build on and be integrated into existing ones, and they should involve stakeholders at all levels. The strengthening of existing food and nutritional surveillance systems to enable them to assess the consequences of HIV/AIDS on food security is needed. However, given the heavy burden that this crisis is placing on many governments, external assistance will often be needed.