



Long-term Perspectives

The outlook for agriculture

The rate of growth in world demand for agricultural products has slowed, because population growth has declined and fairly high levels of food consumption have been reached in many countries. Growth in demand will slow still further in the future. The world as a whole has the production potential to cope with demand. However, developing countries will become more dependent on agricultural imports, and food security in many poor areas will not improve without substantial increases in local production.

So far, world agriculture has been able to respond to the rising demand for crop and livestock products. Although the world's population doubled between 1960 and 2000 and levels of nutrition improved markedly, the prices of rice, wheat and maize — the world's major food staples — fell by around 60 percent. The fall in prices indicates that, globally, supplies not only kept pace with demand, but even outstripped it.

Although global demand for agricultural products has continued to rise, it has done so less rapidly in recent decades. Between 1969 and 1989 demand grew at an average of 2.4 percent a year, but this fell to only 2 percent in the decade from 1989.

Apart from temporary factors (foremost among them a decline in consumption in the transition economies in the 1990s), there were two more enduring reasons for the slowdown:

- The growth rate of world population peaked in the late 1960s at 2 percent a year and slowed thereafter.
- A rising proportion of the world's population had reached fairly high levels of food consumption, so the scope for further increase was limited. By 1997-99, 61 percent of the world's population were living in countries where average food consumption per person was above 2 700 kcal per day.

Demand for agricultural products will continue to grow more slowly

These factors will continue to influence trends in demand over the next three decades. For example, world population will go on rising, but less rapidly, growing at an average of 1.1 percent a year up to 2030, compared with 1.7 percent a year over the past 30 years.

As a result, future demand for agricultural products is expected to slow further — to 1.6 percent a year for the period 1997-99 to 2015 and to 1.4 percent for 2015 to 2030. In developing countries the slowdown will be more dramatic, from 3.7 percent for the past 30 years to an average 2 percent for the next 30.

The forces underlying this slowdown can be seen in the example of China, which has been one of the major engines of growth in the demand for food and agricultural products in the world and in the developing countries over the past few decades. By 1997-99 the Chinese



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had reached an average daily food consumption of 3 040 kcal — only 10 percent short of the level in industrial countries. Over the next three decades the country's aggregate food consumption is expected to grow at only a quarter of the rate seen in the past three decades, while its population will grow at a third of its past rate. Given the sheer size of China's population, these shifts alone will have a huge effect on the global situation. Many other countries, including some of the largest ones, will be undergoing very similar shifts that will further lower the growth of demand.

India's daily average food energy intake per person is still below 2 500 kcal, a level at which there is considerable scope for further increases, while her population will be growing at an average of over 1 percent a year over the next 30 years. Could India take over China's role as a major engine of growth in world agricultural demand? This is not expected, because India's cultural traditions favour

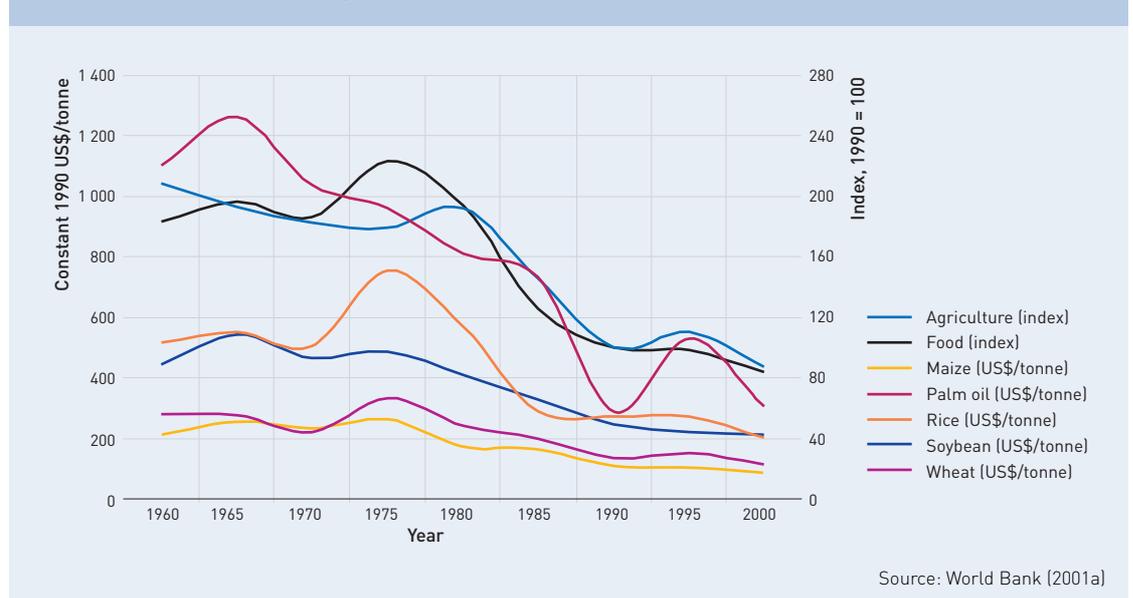
vegetarianism, which will hold back the country's demand for meat and animal feeds at rates well below those seen in China.

Agricultural trade deficits of developing countries will worsen

Traditionally, the developing countries as a whole have had a net surplus in agricultural trade. In value terms this peaked at US\$17.5 billion in 1977. The trend since then has been for their imports to grow faster than their exports. The agricultural trade balance of the developing countries has gradually dwindled until, by the mid-1990s, it was more often negative than positive. The highest recorded deficit was US\$6 billion, in 1996.

This overall trend masks a complex picture which varies from one commodity to another and from one country to another. The drastic decline in developing countries' net surplus in sugar, oilseeds and vegetable oils, for example, reflects growing consumption and imports in several developing countries and the effects of protectionist policies in the major industrial countries. For commodities produced almost entirely in developing countries and consumed predominantly in the industrial countries, such as coffee and cocoa, slow growth in demand prevented the trade balance of the developing

World market prices for agricultural commodities, 1960 to 2000





countries from improving. Fluctuating and, on balance, declining prices further contributed to the problem.

The projections to 2030 show the agricultural trade deficit of developing countries growing still further. In particular, net imports of cereals and livestock products will continue to rise quite rapidly.

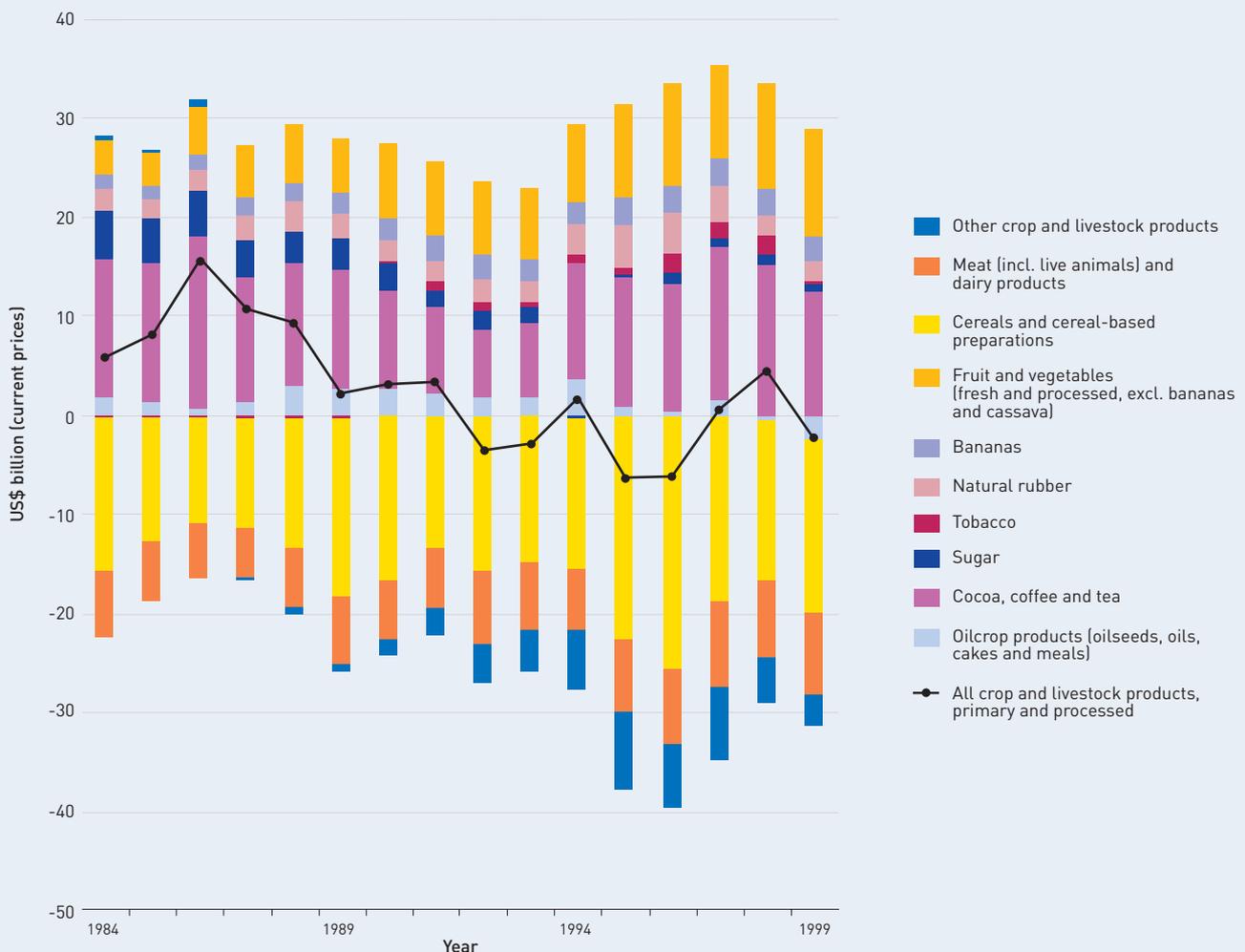
Production will keep pace with demand, but food insecurity will persist

Detailed analysis shows that, globally, there is enough land, soil and water, and enough

potential for further growth in yields, to make the necessary production feasible. Yield growth will be slower than in the past, but at the global level this is not necessarily cause for alarm because slower growth in production is needed in the future than in the past. However, the feasible can only become the actual if the policy environment is favourable towards agriculture.

Globally, producers have satisfied effective market demand in the past, and there is every likelihood that they will continue to do so. But effective demand does not represent the total need for food and other agricultural products,

Net agricultural trade balance of developing countries, 1984 to 1999



Source: FAO data



because hundreds of millions of people lack the money to buy what they need or the resources to produce it themselves.

Thus, even if there is sufficient potential for production in the world as a whole, there will still be problems of food security at the household or national level. In urban areas, food insecurity usually reflects low incomes, but in poor rural areas it is often inseparable from problems affecting food production. In many areas of the developing world, the majority of people still depend on local agriculture for food

and/or livelihoods but the potential of local resources to support further increases in production is very limited, at least under existing technological conditions. Examples are semi-arid areas and areas with problem soils.

In such areas agriculture must be developed through support for agricultural research and extension and the provision of credit and infrastructure, while other income-earning opportunities are created. If this is not done, local food insecurity will remain widespread, even in the midst of global plenty.

Prospects for food and nutrition

Global progress in improving human nutrition will continue, but in numerical terms it will be slow. Even by 2030, hundreds of millions of poor people will remain undernourished unless local food production is given higher priority and inequality of access to food is reduced. However, the lower incidence of undernourishment will make the problem more tractable through national and international policy interventions.

Progress in improving nutrition has been significant

Freedom from hunger is not only a basic human right: it is essential for the full enjoyment of other rights, such as health, education and work, and everything that flows from these.

The world has made significant progress in raising nutrition levels over the past three decades. These levels are most commonly measured in terms of kilocalories per person per day. People in developing countries need between 1 720 and 1 960 kcal per day for basal metabolism and light activity.

World average food consumption per person has risen by almost a fifth, from 2 360 kcal per

person per day in the mid-1960s to 2 800 kcal per person per day today. The gains in the world average reflect predominantly those of the developing countries, given that the industrial and transition economies had fairly high levels of food consumption already in the mid-1960s. Over the period to 1997-99, average daily per capita food consumption in developing countries rose from 2 050 kcal to 2 680 kcal (see Annex Table A3).

The proportion of the world's population living in countries with low average food energy intakes has declined dramatically. In the mid-1960s, no less than 57 percent were living in countries with average intakes below 2 200 kcal per day. India and China both came into this category. By 1997-99, although world population had almost doubled to nearly six billion, this proportion had fallen to just 10 percent. Even the absolute numbers — which decline more slowly because of population growth — fell by over two-thirds, from 1 890 million to 570 million.

At the other extreme, the share of the world's population living in countries with average food energy intakes above 2 700 kcal per person per day has more than doubled, from 30 percent to 61 percent. Rapid gains in some of the largest developing countries, including



China, Brazil, Indonesia and Nigeria, account for much of this progress. India, however, has yet to move into this category.

Over this same period, world annual consumption of cereals for both food and feed has doubled to 1.9 billion tonnes, while that of meat has more than doubled — no mean achievement considering popular fears that the world was running out of potential to increase production. The main forces driving this achievement have included higher incomes, which have increased effective demand, increased supplies, owing to improvements in productivity, and the growth of trade and transport links, which have allowed food deficits in some areas to be covered by surpluses from other areas.

Yet hundreds of millions remain undernourished

This remarkable achievement has nevertheless left out a massive number of people, who continue to fare badly. In 1997-99 there were still 777 million undernourished people in developing countries — about one person in six. This represents only a modest decline from the figure of 816 million for 1990-92.

In China, huge reductions in poverty raised national average food consumption substantially — and this had a strong effect on the global picture. If China is removed from the picture, it becomes clear that the number of undernourished people actually increased in the other developing countries, by almost 40 million.

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The region with the largest number of undernourished people in 1997-99 was South Asia, where 303 million or just under a quarter of the population remained undernourished. The region with the highest proportion was sub-Saharan Africa, where over a third of the total population, or 194 million people, were undernourished.

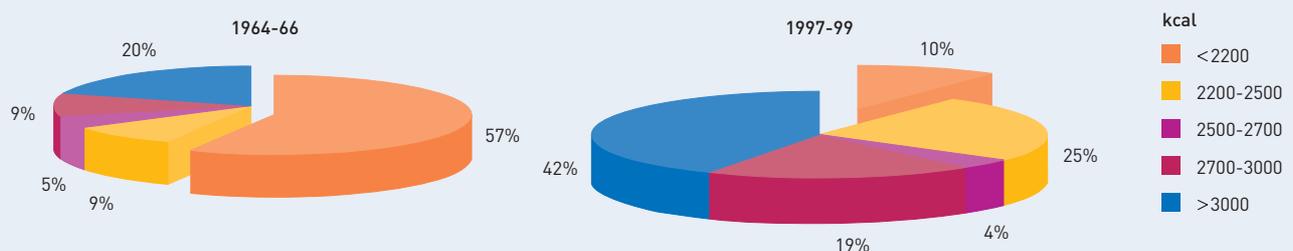
In 1997-99, some 30 developing countries still had average per capita food consumption of below 2 200 kcal per day. War and civil strife were significant factors in no less than half of these countries. In most of them, food consumption today stands at levels below those attained in the past. Some 23 of the 30 are in sub-Saharan Africa, while only 7 are in other regions.

Populations and incomes will continue to grow

Future food consumption patterns are determined by growth in population and in incomes, and by changes in dietary preferences.

The latest projections by the United Nations (UN) show a continuing slowdown in the growth of the world's population. In the medium UN projection, the 6.1 billion people of 2000 will grow to 7.2 billion in 2015 and 8.3 billion in 2030, heading towards 9.3 billion in 2050.

Global progress in nutrition: energy intake levels by percentage of the world's population, 1964-66 and 1997-99



Source: FAO data



Perceptions of a continuing population explosion are false. In fact it is more than 30 years since the world passed its peak population growth rate, of 2.04 percent a year, in the late 1960s. Since then the growth rate has fallen to 1.35 percent. This is expected to fall further to 1.1 percent in the period 2010 to 2015 and to 0.8 percent in 2025 to 2030. There will be a corresponding slowdown in the growth of demand for food.

The absolute numbers added each year are also past their peak of 86 million a year, reached in the late 1980s. Even so, current annual additions of around 77 million still amount to almost a new Germany each year. The yearly increments will taper off only slowly during the study period: even by the period 2025 to 2030 they will still be running at 67 million a year. It is only by the middle of the century that these increments will have fallen significantly, to 43 million per year in 2045 to 2050. Almost all of these increases will be in the developing countries.

By 2030 there will be substantial differences in population growth rates among the developing countries. While East Asia's population will be growing at only 0.4 percent a year, that of sub-Saharan Africa will still be growing at 2.1 percent. By 2030, every third person added to the world's population will be a sub-Saharan African. By 2050, this will rise to every second person.

The second major factor determining the demand for food is growth in incomes. The latest World Bank assessment of future economic growth is less optimistic than its predecessors, but it still projects a rise of 1.9 percent a year in per capita incomes between 2000 and 2015, higher than the 1.2 percent seen in the 1990s.

What will happen to the incidence of poverty under this overall economic scenario is of great importance to food security because poverty and hunger are closely associated. The World Bank has estimated the implications of its economic growth projections for poverty reduction by the year 2015. They are that:

- It is possible to achieve the goal of halving the *proportion* of people living in absolute poverty

— defined as an income below US\$1 per day — by 2015, over the 1990 level.

- However, it is unlikely that the *number* of poor people can also be halved. This will decline from 1.27 billion in 1990 to 0.75 billion in 2015.
- Much of the decline will be due to development in East and South Asia. Indeed, about half of the decline of 400 million projected for East Asia has already occurred.
- Only in sub-Saharan Africa, where incomes are expected to grow very slowly, are the numbers living in poverty expected to rise, from 240 million in 1990 to 345 million in 2015. By then, two out of five people in the region will be living in poverty.

Average nutrition will improve, but undernourishment will fall only slowly

In the light of these changes in population and incomes, progress in improving nutrition is expected to continue, though more slowly than in the past. Average per capita food consumption in developing countries is projected to rise by 6.3 percent, from 2 680 kcal in 1997-99 to 2 850 kcal in 2015. This is a third of the rise achieved between 1974-76 and 1997-99.

The slowdown is occurring not because of production limits but because many countries have now reached medium to high levels of consumption, beyond which there is less scope than in the past for further increases. Huge countries such as China, where per capita consumption rose from 2 050 kcal per day in the mid-1970s to over 3 000 kcal per day today, have already passed the phase of rapid growth. More and more countries will be attaining such levels over the projection period.

By 2030, three-quarters of the population of the developing world could be living in countries where less than 5 percent of people are undernourished. Only 1 in 13 live in such countries at present.



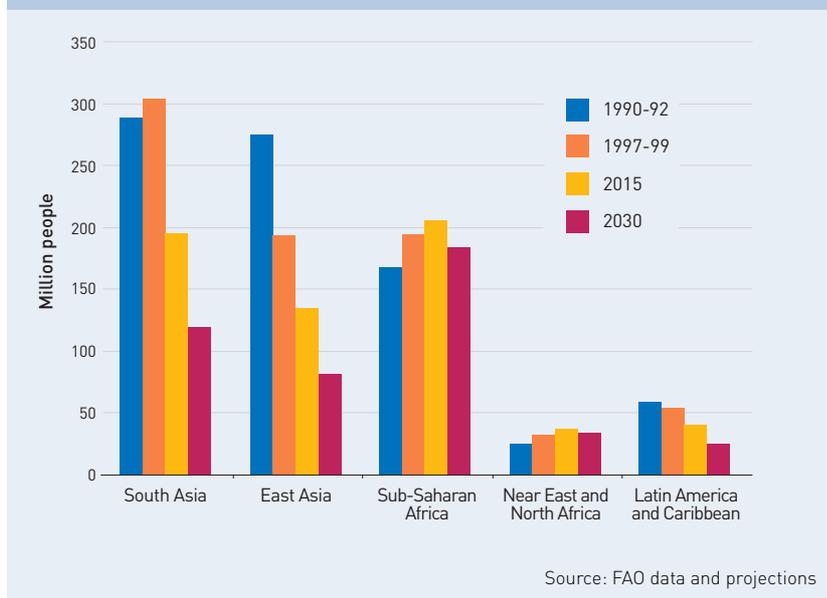
The World Food Summit of 1996 set a target of halving the numbers of undernourished in developing countries by 2015, compared with the base period of 1990-92. FAO's study has found that the proportion of undernourished people should fall significantly, from 20 percent in 1990-92 to 11 percent by 2015 and 6 percent by 2030. However, in numerical terms the World Food Summit target is unlikely to be met. The total number of undernourished people will probably fall from 815 million in 1990-92 to some 610 million by 2015. Not until 2030 will the numbers fall to 440 million, thereby approaching the 2015 target.

The proportion of the world's population living in countries with per capita food consumption under 2 200 kcal per day will fall to only 2.4 percent in 2030. The reduction in the number of undernourished people will be impressive in some regions: in South Asia, for example, it could fall from 303 million in 1997-99 to 119 million in 2030, while in East Asia the number could halve from its current level of 193 million.

In contrast, in sub-Saharan Africa and the Near East and North Africa, there is likely to be little or no decline in the numbers of undernourished people, although the proportion will approximately halve. By 2030, all regions except sub-Saharan Africa should see the incidence of undernourishment decline to between 4 and 6 percent, down from the range of 9 to 24 percent today. In sub-Saharan Africa, 15 percent of the population or 183 million people will still be undernourished by 2030. This will be by far the highest total for any region, and is only 11 million less than in 1997-99. The fate of sub-Saharan Africa is therefore cause for serious concern.

As incomes rise, access to food should become more equal. This is because poor people spend a high proportion of increases in their incomes on food, whereas there is an upper limit to the amount of food that rich people want to eat. This greater equality will have a significant effect on the numbers of undernourished people. For example, in the 44 countries that will have average per capita food intakes of over 2 700 kcal per day in 2015,

Number of undernourished people by region, 1990-92 to 2030



the number of undernourished people is expected to be 295 million. But if inequality of access to food were to remain unchanged at today's level, this number would be 400 million.

The decline in the numbers of undernourished between now and 2030 will be slow, for several reasons:

- Rapid population growth means that, although the proportion of undernourished may fall, the absolute number will fall much less and may in a few cases even rise. This is an important factor in sub-Saharan Africa and the Near East and North Africa.
- Economic growth will not be fast enough. In the Niger, for example, 3.3 million people or 41 percent of the population were undernourished in 1990-92. To achieve the World Food Summit target, the number of undernourished will need to fall to 1.65 million or 9 percent of the population by 2015. To bring this about would require growth rates far above what the Niger has seen over the past two decades.
- Several countries start from highly adverse conditions, namely low national average food



consumption, high incidence of undernourishment and high projected population growth. For example, nine developing countries had proportions of undernourishment in 1990-92 of over 50 percent (Afghanistan, Angola, Burundi, Democratic Republic of Congo, Eritrea, Ethiopia, Haiti, Mozambique and Somalia). In these countries the proportion of undernourished is expected to fall to 39 percent by 2015 and to 25 percent by 2030. However, because of the relatively high growth rate of this group's population, the absolute numbers affected will rise to 115 million in 2015 and may still be 106 million in 2030. Even these figures are based on projections for growth in food consumption that are much faster than the fastest seen in any comparable period in the past.

- In countries where average food intake is currently low and the majority of people are hungry, reducing inequality of access to food

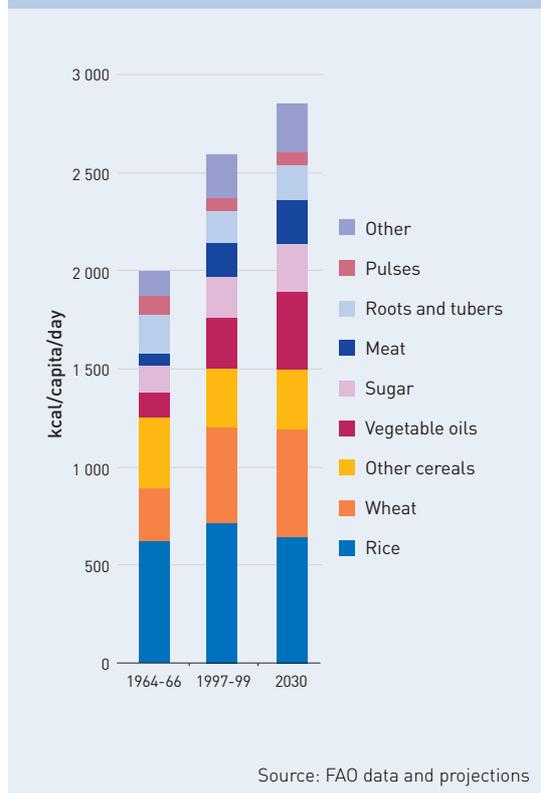
has only a small impact on levels of undernourishment. This is because few people are on diets that are more than barely adequate, so redistributing their food "surplus" does not greatly improve matters. By 2015 there will still be 41 countries with average food intakes of 2 500 kcal per day or less.

- In the future the threshold for defining undernourishment will rise, as ageing reduces the proportion of children in the population. Since children's food energy requirements are lower than those of adults, the average calorie requirement in developing countries will rise by around 3 percent by 2030. If it were not for this rise in the threshold, the number of undernourished estimated for 2030 would be 370 million instead of 440 million.

The number of undernourished can be reduced more rapidly by affording increased priority to agriculture, increasing national food production and reducing inequality of access to food. These three measures should be combined with continuing interventions to cope with the consequences of local food crises, until the root causes of undernourishment have been removed.

It is possible for countries to raise nutrition levels even in the absence of significant economic growth. Mali raised average food consumption by almost a third in the 1980s, although per capita household expenditure fell over this period. Other countries, such as Benin, Burkina Faso, Ghana, Mauritania and Nigeria, achieved similar quantum leaps at times of slow income growth. The common characteristic seems to have been rapid growth in the production of food staples (cereals, roots and tubers), leading to improved self-sufficiency, at least in cereals. Because most agriculture was at or below the subsistence level, increased production led directly to improved food consumption in rural populations.

Dietary changes in developing countries, 1964-66 to 2030



The problem of undernourishment should become more tractable

The projections imply that the problem of undernourishment should become more tractable in future. This will work in two major ways:



How diets will change

Just as world average calorie intakes have increased, so also people's diets have changed. Patterns of food consumption are becoming more similar throughout the world, incorporating higher-quality and more expensive foods such as meat and dairy products.

This trend is partly due to simple preferences. Partly, too, it is due to increased international trade in foods, to the global spread of fast food chains, and to exposure to North American and European dietary habits. Convenience also plays a part, for example the portability and ease of preparation of ready-made bread or pizza, versus root vegetables. Changes in diet closely follow rises in incomes and occur almost irrespective of geography, history, culture or religion. However, cultural and religious factors do explain differences between countries with similar income levels. For example, Hindus abstain from beef or meat in general, Muslims and Jews from pork. Despite similar income levels, Japanese people consume far fewer calories from non-starchy foods than do Americans, as do Thais compared with Brazilians.

Dietary convergence is quite high among the high-income countries of the Organisation for Economic Co-operation and Development (OECD), where food consumption patterns show a 75 percent overlap with

those in the United States, meaning that 75 percent of processed food products are based on the same raw materials. Even Japan has been moving closer to other OECD countries, with the overlap rising from 45 percent in 1961 to about 70 percent in 1999. Convergence towards North American dietary patterns is also occurring in other groups of developing countries, though only slowly in some cases, especially in land-locked or politically isolated countries where international influences permeate less easily. However, cultural factors appear to limit convergence to an upper ceiling of around 80 percent, at least for the time being.

These changes in diet have had an impact on the global demand for agricultural products and will go on doing so. Meat consumption in developing countries, for example, has risen from only 10 kg per person per year in 1964-66 to 26 in 1997-99. It is projected to rise still further, to 37 kg per person per year in 2030. Milk and dairy products have also seen rapid growth, from 28 kg per person per year in 1964-66 to 45 kg now, and could rise to 66 kg by 2030. The intake of calories derived from sugar and vegetable oils is expected to increase. However, average human consumption of cereals, pulses, roots and tubers is expected to level off.

- As the incidence of undernourishment diminishes, more and more countries will find it easier to address the problem through national policy interventions. By 2030, three-quarters of the population of developing countries could be living in countries where less than 5 percent of people are

undernourished, compared with 7.7 percent at present. This dramatic change will occur because the majority of the most populous countries (Brazil, China, India, Indonesia, Islamic Republic of Iran, Mexico and Pakistan) will shift to the "under-5-percent" category.



- The number of countries with severe problems of undernourishment will become smaller over time. International policy responses will tend to become more feasible and effective, as the total effort need not be spread so thinly. For example, if the

projections come true, the number of countries with undernourishment of over 25 percent will fall from 35 at present (accounting for 13 percent of the population of the developing countries) to 15 in 2030 (accounting for only 3.5 percent).