The spectrum of malnutrition

Adequate nutrition is essential for economic growth, good health and physical and cognitive development. It requires a diverse diet including staple foods, vegetables, fruits, animal-source foods and where needed, fortified foods. Levels of nutrition are affected not only by food availability and access but also by sanitation – such as access to safe drinking water – and disease. In addition, education can play a key role in improving nutritional intake and balance.

Chronically food-insecure populations are characterized by high or very high levels of undernutrition and recurrent high levels of acute malnutrition (wasting, low weight-for-height). These factors limit the development of individuals and societies. Undernutrition accounts for approximately 12 percent of deaths worldwide, and in developing countries, 60 percent of deaths in the under-five age group are linked with the low weight (i.e. one third of the 8.8 million annual child deaths). The malnourished are exposed to a high risk of diarrhoeal disease from contaminated water and food, and in turn diarrhoea worsens the effects of malnutrition, as it compromises the human body's capability to utilize nutrients.

Underweight children whose growth is **stunted** (when a children's height is low for their age – a telling indicator of chronic undernutrition) and **wasting** (when children's weight is low for their height – a measure of acute undernutrition) are highly unlikely to reach their full educational and productive potential, especially if these conditions are present under the age of two. This affects both the individuals and their countries' long-term prospects for economic growth and development. South Asia has the highest levels of stunting and wasting in the world, with 46 percent of its children stunted and 15 percent wasted. Sub-Saharan Africa has the next highest proportion of stunted children, with a prevalence as high as 41 percent in Eastern/Southern Africa, and 28 percent of its children underweight.

According to the United Nations Children's Fund (UNICEF), more than 20 million infants are born each year weighing less than 2.5 kg. This represents 17 percent of the total number of births in developing countries. Infants with **low birth weight** are at high risk of mortality during their early months. Those who survive are often afflicted with an impaired immune system and are prone to suffer chronic illnesses in later life. Over 96 percent of cases of low birth weight occur in developing countries, where there is a high likelihood of being born in poor socio-economic conditions, and where women often undertake physically demanding work during pregnancy and are prone to infection and poor diets. The high prevalence is also symptomatic of intergenerational transmission of poor nutritional status, the consequences of which are passed to children by mothers who are themselves in poor health or undernourished.

Map 21:

Source: WHO-WHS

Metalink: P2.HUN.WHO.GHO.CHLD.UW, p. 170

→ Children living in rural areas of developing regions are two times more likely to be underweight than are urban children

→ Insufficient nutritional achievement by age two condemns a child to being less academically capable, receiving lower incomes as an adult, and in the case of girls, being at greater risk of difficult childbirth and maternal mortality

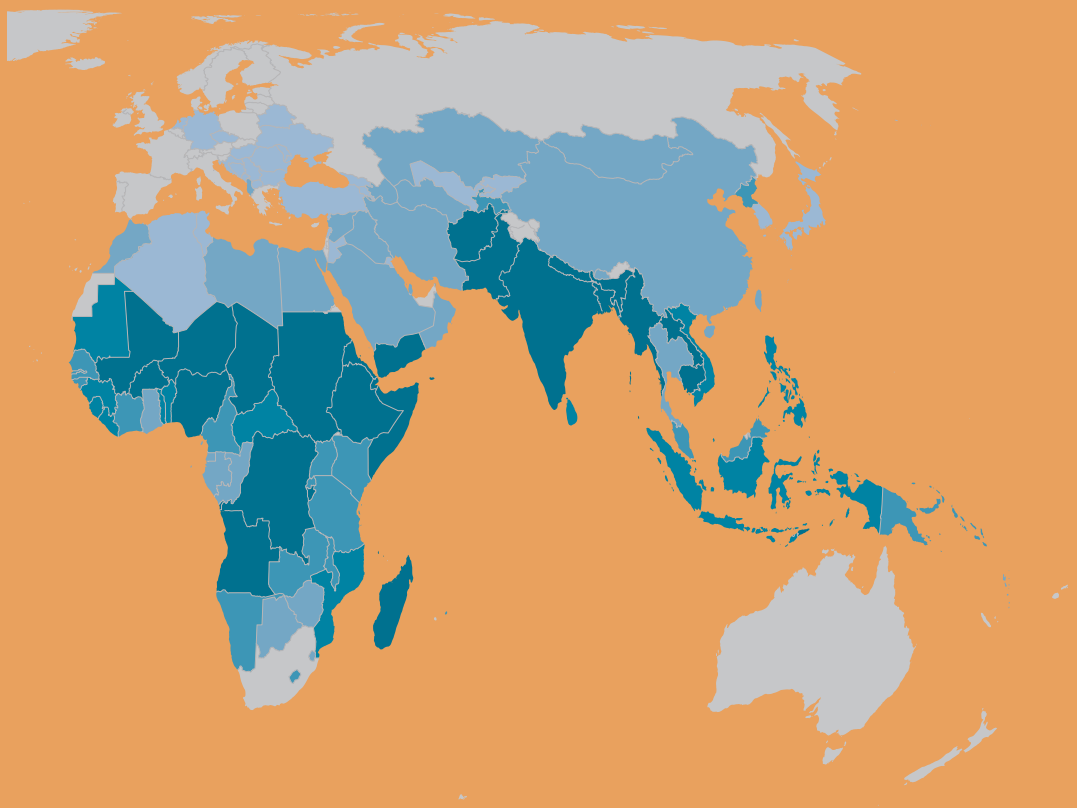
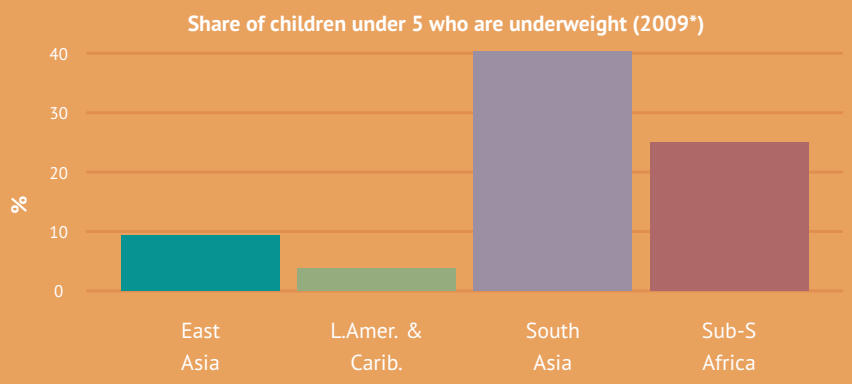


Chart 42: South Asia has the highest prevalence of underweight children in the world



Source: WHO-WHS

Metalink: P2.HUN.WHO.GHO.CHLD.UW, p. 170

Early childhood nutrition plays a key role in cognitive achievement, learning capacity and ultimately household welfare. Available studies have shown that low birth weight, protein energy malnutrition in childhood, childhood **iron-deficiency anaemia** and iodine deficiency (e.g. being born to a mother with goitre) are all linked to cognitive deficiencies and the effects are more or less irreversible by the time a child is ready to go to school.

The UN Standing Committee on Nutrition (SCN) has estimated that the economic costs of anaemia in Bangladesh alone, for example, amount to 7.9 percent of the country's Gross Domestic Product (GDP). More widely, when a significant proportion of the population is undernourished, potential rates of GDP growth can be curtailed. For example in South Asia, adult productivity losses arising from the combined effect of stunting, iodine deficiency and iron deficiency are equivalent to a loss of 2 to 4 percent of GDP every year.

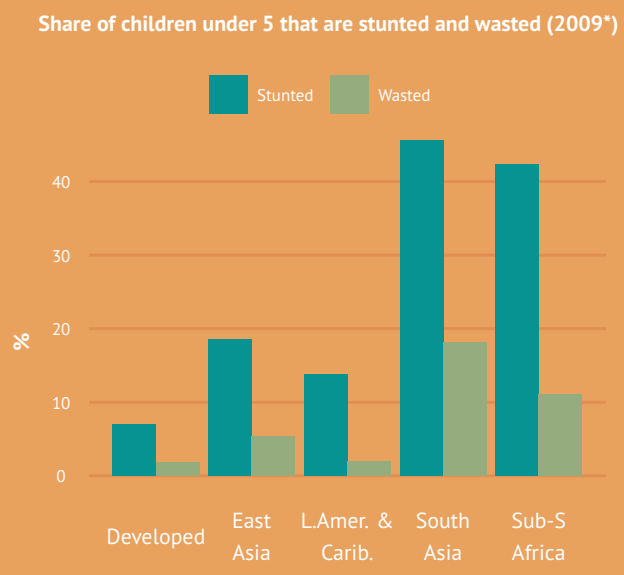
In adults, a commonly used measure to detect malnutrition is the **body mass index** (BMI), defined as the ratio of bodyweight in kilograms to the square of height in metres. BMI can clearly vary over a person's lifetime, but physical stature is determined by the time an individual reaches adulthood. Low stature and low BMI are associated with lower labour force participation – not only do people with lower stature or BMIs earn less, but they are less likely to be in a position to earn wages at all.

At the other end of the malnutrition spectrum is the problem of **overnourishment**, which leads to overweight and obesity. Already a well-known phenomenon in developed countries, obesity is also increasing in the developing world, especially among urban dwellers. The issue of obesity has not been given much attention in developing countries because of the more compelling problems at the other end of the scale. Overnutrition is a result of diets that are characterized by energy-dense, nutrient poor foods that are high in fat, sugar and salt. It is a major contributor to heart disease, stroke, diabetes and cancer, and is compounded by low levels of physical activity and by tobacco consumption. Worldwide obesity has more than doubled since 1980. At 1.5 billion adults aged 20 and over, there are more overweight adults in the world today than there are undernourished. Of them, over 200 million men and nearly 300 million women are obese.

Further reading

- FAO Nutrition and Consumer Protection Division (www.fao.org/food/)
- UNICEF Nutrition (www.unicef.org/nutrition/)
- WHO Nutrition and disorders (www.who.int/topics/nutrition_disorders/)

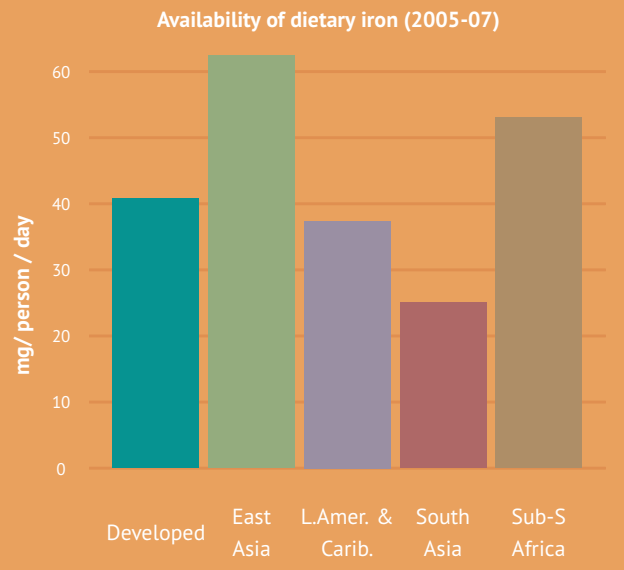
Chart 43: One in nine children under five are low weight-for-height in developing countries. Stunting and wasting are caused by long-term insufficient nutrient intake



Source: WHO-WHS

Metalink: P2.HUN.WHO.GHO.CHLD.STNT, p. 170

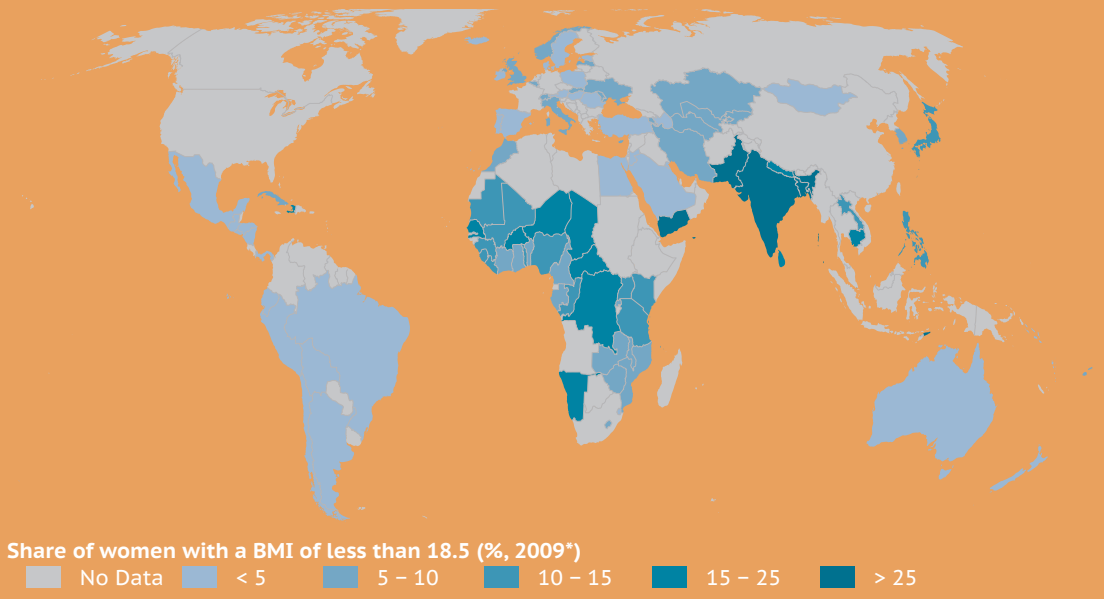
Chart 44: Insufficient iron in diets is a primary cause of anaemia, and is common in vegetal-based diets



Source: WHO-WHS

Metalink: P2.HUN.FAO.MCN.IRON, p. 165

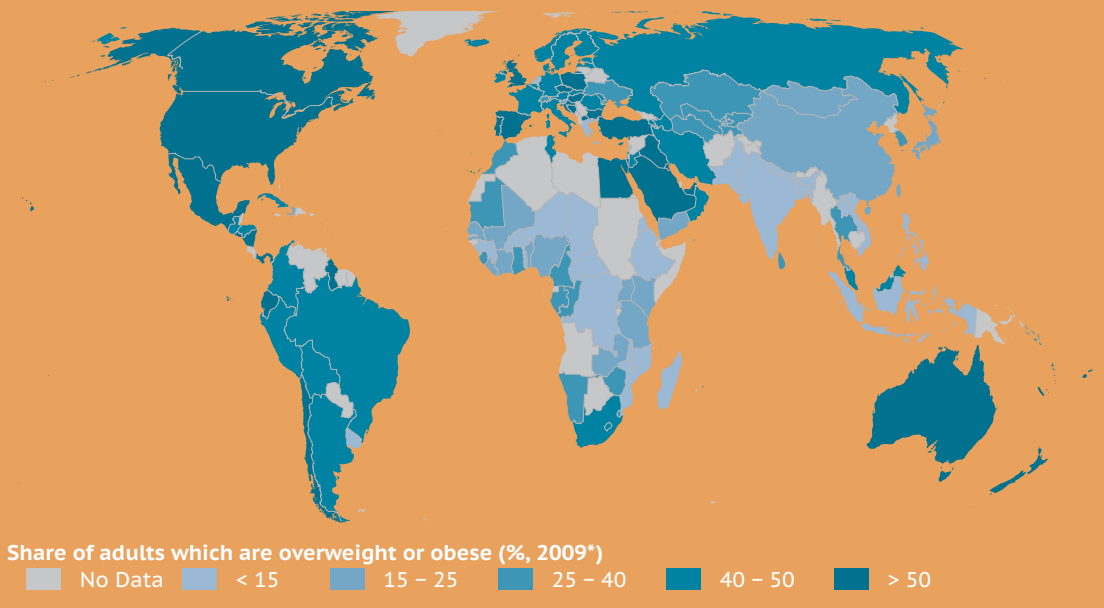
Map 22: Undernourished women are more likely to raise children who are undernourished, reinforcing the intergenerational cycle of malnutrition



Source: WHO-WHS

Metalink: P2.HUN.WHO.GHO.ADLT.LBMIF, p. 170

Map 23: Obesity is an entrenched problem in many developed countries, but under- and over-nutrition co-exist in many countries, leading to a double burden of malnutrition



Source: WHO-WHS

Metalink: P2.HUN.WHO.GHO.ADLT.OBSx, p. 170

Trade, food stability and food security

Against the backdrop of deepening international markets, convertible domestic currencies, improved international transportation networks and diminishing public stock regimes, trade plays an increasingly important role in stabilizing food availability in almost all countries. When agricultural-based countries experience declining per capita production of staple foods, the role of trade becomes pivotal in their food security.

Equally, trade assists food security in staple food production systems undergoing wide fluctuations caused by variable climates, especially in those systems that are rain-fed. High coefficients in the variation of staple food production – 10 percent and above – are common in much of sub-Saharan Africa. This means that a shortfall of at least 10 percent of average staple production occurs every six years.

Instability in food production can also lead to problems in global markets. While a handful of countries continues to dominate supply in the international arena, there is an increasing number of countries at the margin that participate in exports. Those that have emerged recently as regular international suppliers instil a great degree of uncertainty in the global marketplace owing to the high year-to-year variability of their production. This is particularly true for several rain-fed grain producing countries in the Black Sea region, which triggered turmoil in markets midway in 2010 when weather problems lowered export availabilities. This feature can also shift the net-trade status of large producing and consuming countries from one year to the next, bringing uncertainty to markets (as in the case of rice).

Beyond production instability, trade deficits in many of the most food-insecure countries have become structural over the past two decades. Expensive inputs, high shipment costs and high losses from farms to markets have lowered the competitiveness of the agriculture sector in many developing countries. At the same time, large global suppliers have benefited from subsidies in export markets and the transformation of the retail sector in importing countries, resulting in a growing prevalence of higher foreign standards. These factors contributed to the growing trade deficit of many developing countries, which shifted their trade status from a position of net exporters to that of net importers. The most economically vulnerable group, including least developed countries (LDCs), has been hardest hit; their net food and agriculture **import bills** have soared over the past 20 years to a level of nearly USD 27 billion by 2010.

Map 24:

Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.TFS.SSCAL, p. 165

→ Underperforming productive sectors and/or a lack of resource endowments are behind low rates of food self sufficiency, requiring imports to fill food deficits

→ Many countries in sub-Saharan Africa and Latin America and the Caribbean do not produce enough food to cover domestic food needs

→ However, food security should not be confounded with food self sufficiency

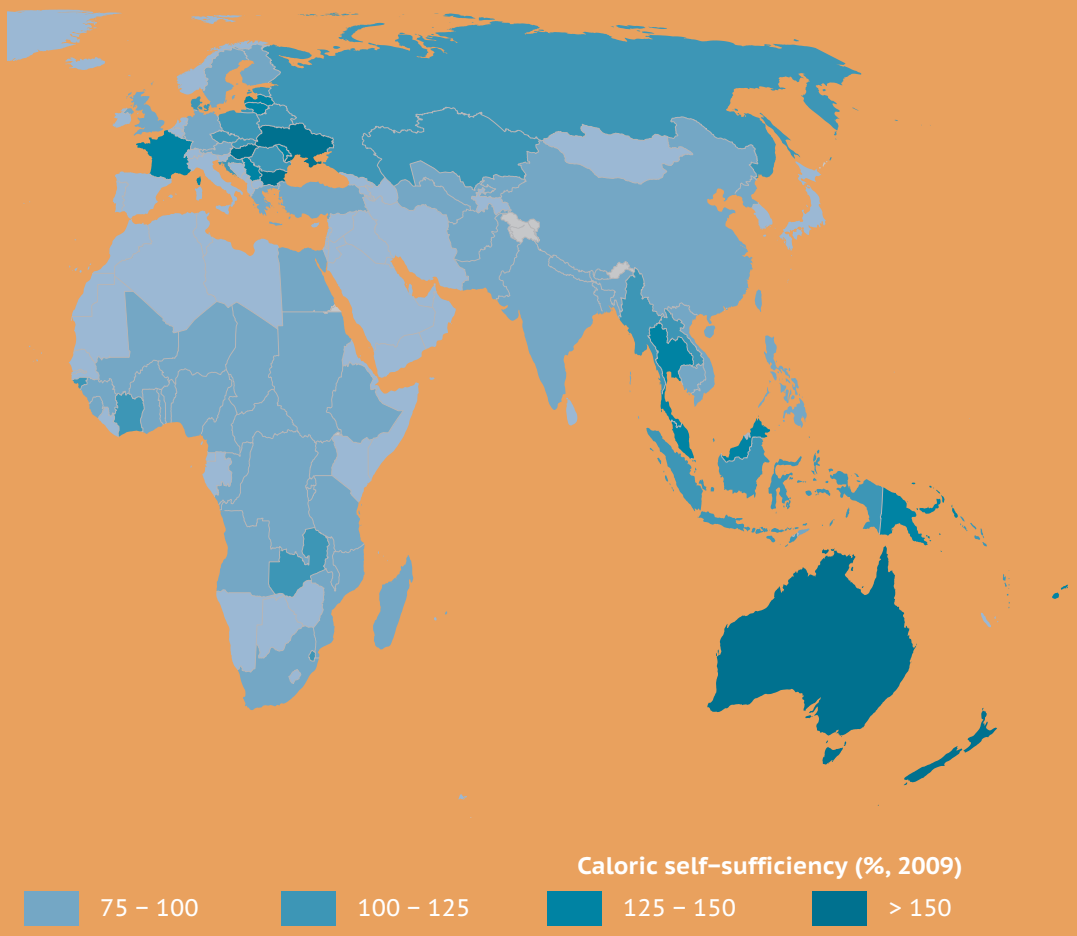
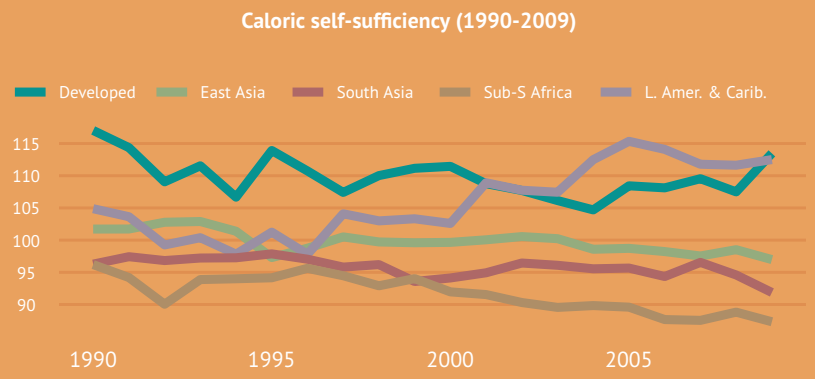


Chart 45: Much of Latin America more than self-sufficient in food but the converse in Africa



Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.TFS.SSCAL, p. 165

With the global cost of purchasing food on the international marketplace surpassing USD 1 trillion in 2010 (as it did in 2008), food import bills for LDCs have climbed the most. At 17 percent, their increase far exceeded that of the global level. The sheer encumbrance facing some of the world's poorest countries in importing food can be contrasted to that of developed nations, whose food import bills rose by only 8 percent in 2010. Seen in a broader perspective, expenditures on imported foodstuffs for vulnerable countries account for roughly 18 percent of all their expenditures on imports, compared to a world average of around 7 percent.

Rising import bills could lead to increased stress if there is insufficient income growth or export earnings to accommodate the higher pace of food import costs. Higher food import bills can place a severe burden on the balance of payments, depriving disadvantaged countries of limited foreign exchange reserves that could be used for importing other essential goods and services, such as **fuel** and inputs. Sovereign credit ceilings also constrain the ability to finance imports and to meet unforeseen higher procurement costs.

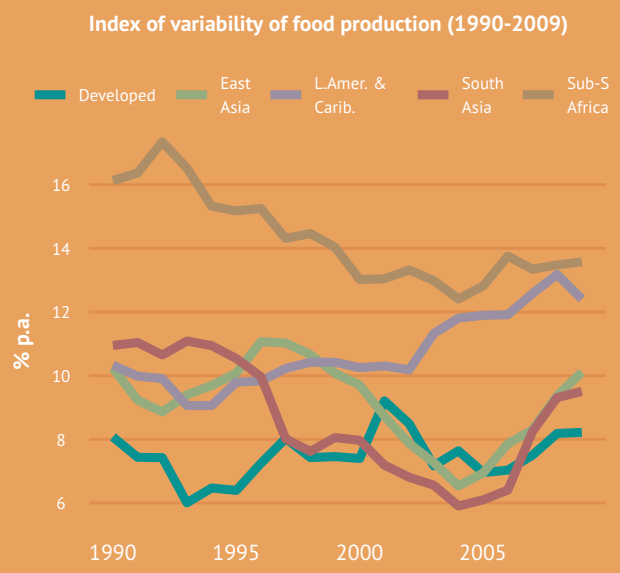
The on-going instability in international food markets has prompted rising mistrust in many food-importing countries about the reliability of international markets as suppliers of affordable food. Several countries have explored the possibility of becoming less reliant on food imports in the context of safeguarding their own food security. The notion of food security often becomes conflated with ideas about food **self-sufficiency**.

Food security and food self-sufficiency, however, are different concepts, and are often at odds with one another. Self-sufficiency policies that distort market signals using protectionist strategies, such as import bans, have high social costs given their distributional effects. They place food self-sufficiency at variance with the goals of food security and poverty reduction. But, by improving agricultural productivity and domestic competitiveness, imports are likely to be deterred, and consequently, higher levels of self-sufficiency will be compatible with food security and poverty reduction.

Further reading

- FAO World Food Situation (www.fao.org/worldfoodsituation/en/)
- FAO Food Outlook (www.fao.org/giews/english/fo/index.htm)
- Prakash (2011b)

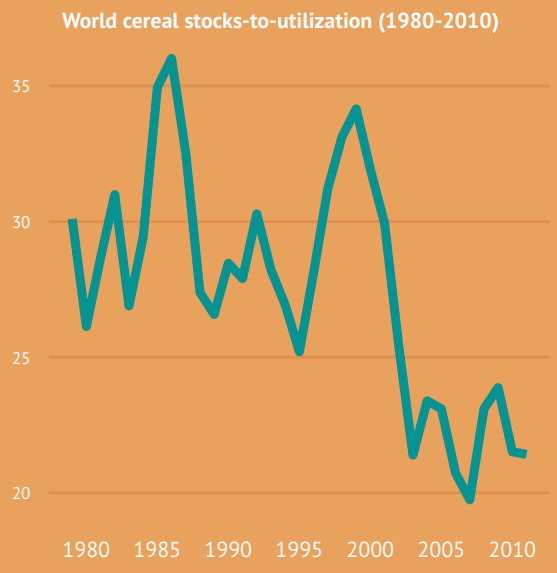
Chart 46: Production variability remains high in many food-insecure regions



Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.TFS.QPVAR, p. 165

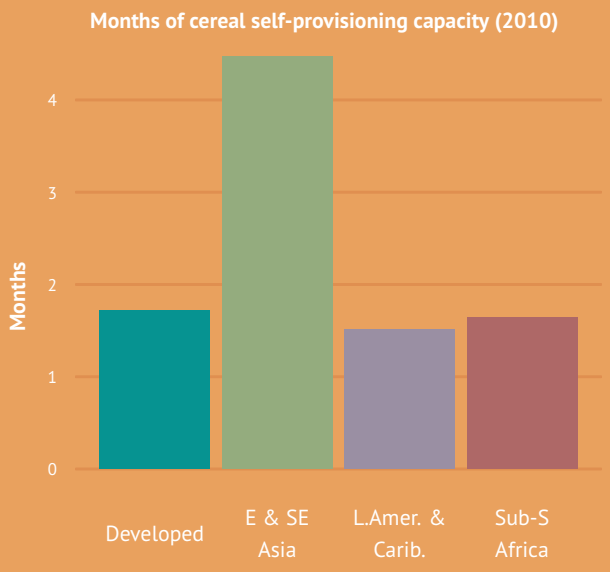
Chart 47: Global cereal stocks on the decline owing to policy shifts and greater dependence on trade



Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.TFS.STU, p. 165

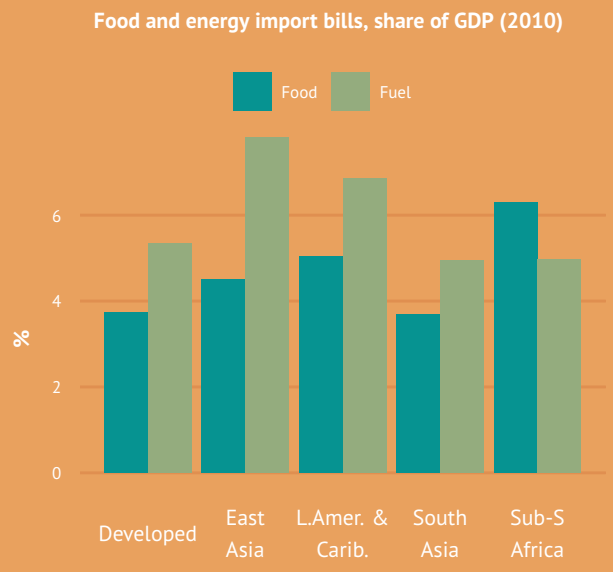
Chart 48: Barring Asia, cereal stocks are sufficient to meet less than two months of consumption



Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.TFS.STU, p. 165

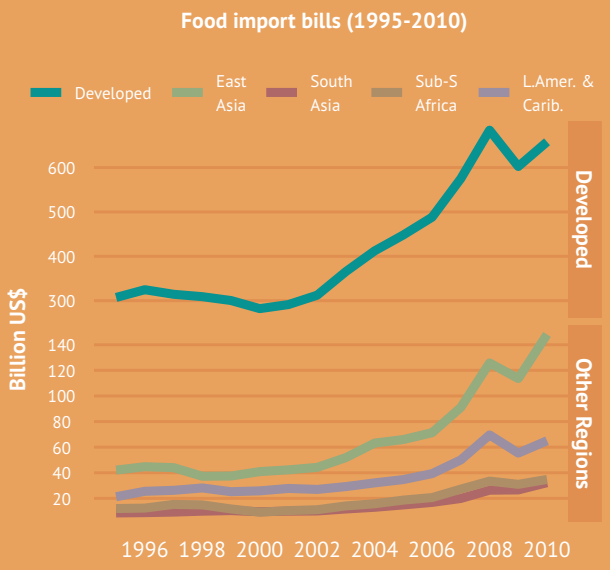
Chart 50: The burden of food and energy import bills is high when measured against GDP



Source: FAO-IMF

Metalink: P2.HUN.FAO.TFS.FIB, p. 165

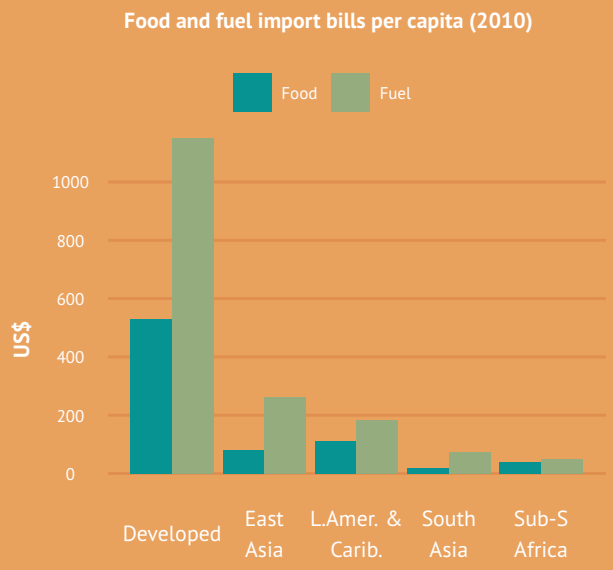
Chart 49: Food import bills have risen markedly in the past few years, driven by a combination of higher international prices and greater trade



Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.TFS.FIB, p. 165

Chart 51: ... and also on a per capita basis



Source: FAO-UNSD

Metalink: P2.HUN.FAO.TFS.FIB, p. 165

Food prices and food price volatility

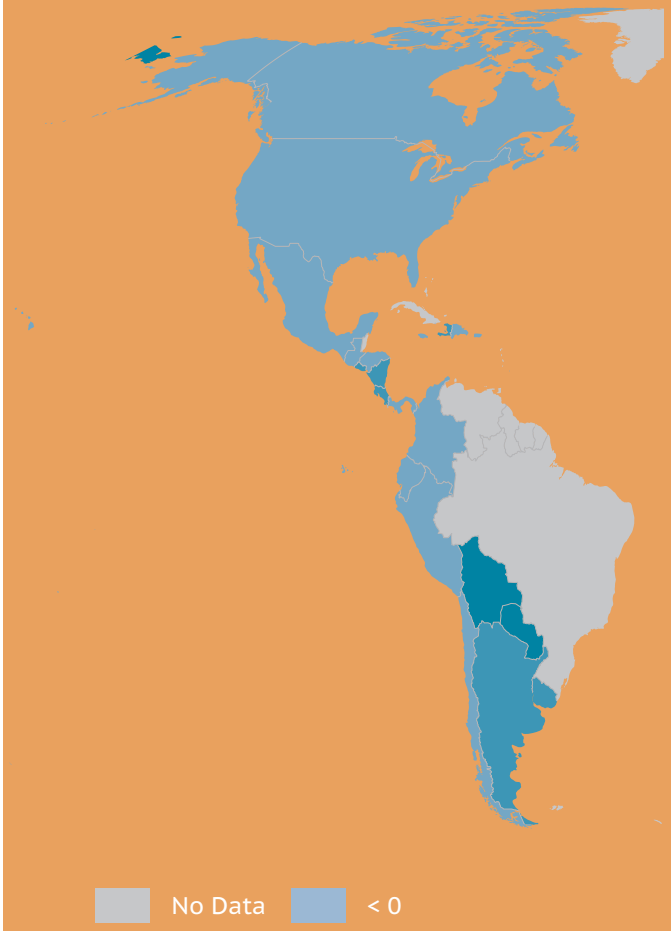
High food prices pose a major threat to food security. By reducing real incomes, rising prices can worsen the prevalence of hunger and malnutrition because they reduce the quantity and quality of food consumed. The impact of high prices falls heaviest on the poor, especially female-headed households and the landless, which may spend as much as 80 percent of their income on food. The lack of dietary diversification aggravates the problem, as price increases in one staple cannot easily be compensated by a switch to other foods. The lack of adequate social and income safety nets, such as savings, compounds price increases.

Vulnerable households often deal with soaring prices by selling assets, which are very difficult to rebuild, and by cutting down on health and education expenditures. These short-term coping mechanisms have long-term negative, sometimes irreversible, effects on livelihoods.

Soaring food prices have triggered worldwide concern about threats to global food security, and have shaken the unjustified complacency caused by many years of low commodity prices. Up until 2006, the cost of the global food basket had fallen by almost a half over the previous thirty years or so when adjusted for inflation. Declining real prices as a result of technological advances put farmers under considerable strain, except mainly in developed countries, where governments were able to provide support to agricultural producers through subsidies and price guarantees. Elsewhere, public and private sectors saw limited need or incentive to invest in agricultural production and infrastructure. These factors rendered production in many developing countries unprofitable and entrenched the role of a handful of countries in regularly supplying the world with food. Changes in the market and policy setting were also instrumental in reducing stock levels and have led to far more planned dependence on imports as an efficient way of achieving food security.

Taken together, these developments have imposed a heavy responsibility on major exporting countries to supply international markets when called upon. It is thus unsurprising that when production shortages occur in such countries, global supplies are stretched and the ensuing market tightness manifests both higher prices and higher volatility. This was precisely the case in the run-up to the high-price episodes that the world has witnessed in recent years. Other contributory factors included dependence on new exporting zones, where rainfed crop outcomes are much more prone to weather vagaries, growing demand for food from other sectors (e.g., energy), faster transmission of macroeconomic factors onto commodity markets, and lack of trade policy discipline, especially in the context of export restraints.

Map 25:



Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.FPV.FCPI, p. 164

- → Food purchases can account for as much as 80 percent of household expenditure in developing countries
- → Rising prices of food are particularly harmful in these circumstances
- → Affected households often respond by selling productive assets, which are difficult to rebuild, and by cutting down on health and education expenditures, leading to longer-term problems

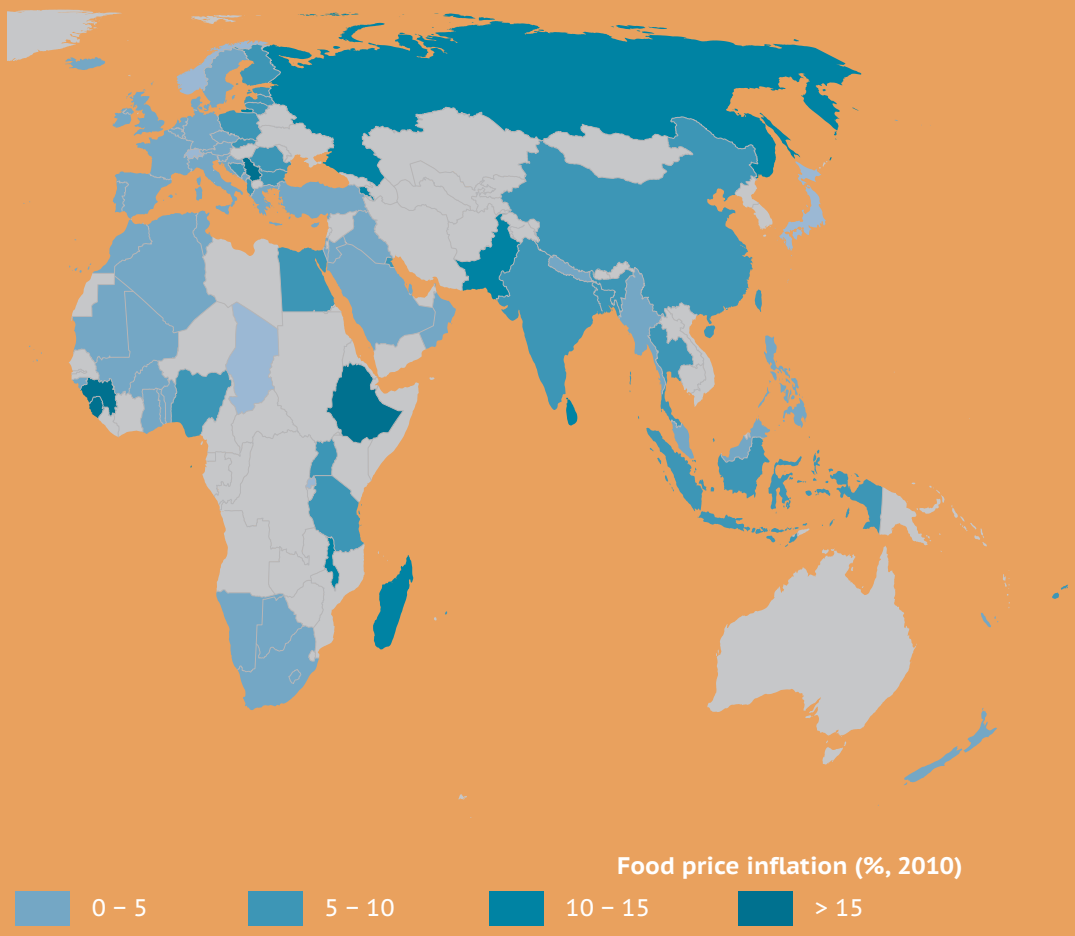
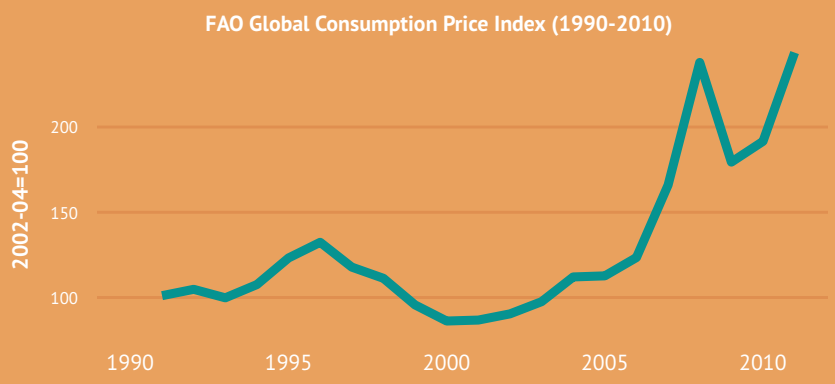


Chart 52: The international price of the global food basket has soared in recent years



Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.FPV.GCI, p. 164

In 2011, international prices rose to levels not seen in decades. The export-weighted FAO food price climbed to a record 238 points in February and remained stubbornly high throughout much of the year. Escalating world prices for cereals, vegetable oils and sugar (40, 35 and 25 percent, respectively over the past year) have fuelled much of the increase. The FAO global food consumption index, which uses global average calorie shares as weights, also rose to a record level, climbing 26 percent from 2010.

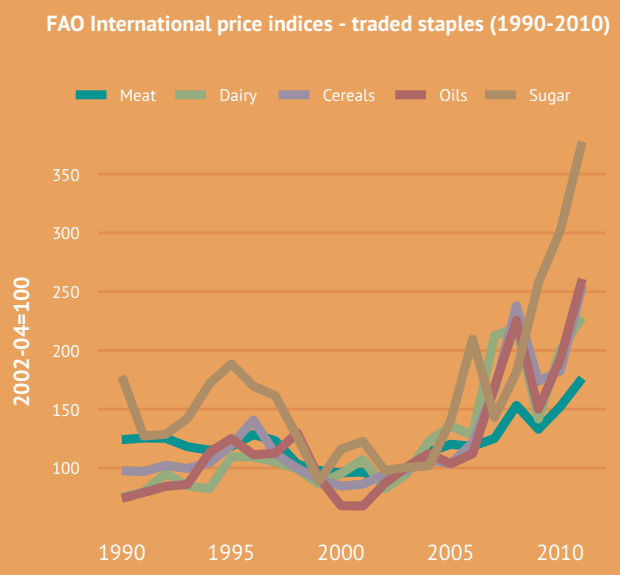
Movements of prices in global markets may seem less important than price movements within domestic markets, as international trade accounts for a low percentage of global transactions. The issue is how global price movements affect domestic prices and markets for agricultural products inside countries (and, potentially, vice versa) and how international prices are transmitted differentially to producers and to consumers.

Measuring price transmission is often plagued with difficulties, but as markets are increasingly integrated in the world economy, price changes in the international arena can potentially transpire and spread to domestic markets much more quickly than before.

There is emerging consensus that the global food system is becoming more vulnerable to episodes of high prices and **volatility**. Price volatility is by no means a new phenomenon in developing countries, where significant seasonal or annual price fluctuations remain features of rural life. With poor infrastructure, local prices may be subject to substantial variation. While price volatility is in part a function of the interplay between global and domestic factors, it is also a structural problem.

Bouts of high price volatility come at a cost, as market participants have difficulty planning ahead and adjusting to fluctuating market signals. As unpredictable changes, or "shocks", surpass a certain critical size and persist at those levels, traditional policy prescriptions and coping mechanisms are likely to fail. For instance, high price volatility can result in large income fluctuations for farmers, who have little or no recourse to savings and insurance. The delay between production decisions and actual production creates additional risks, as farmers base their investment and planning on expected prices.

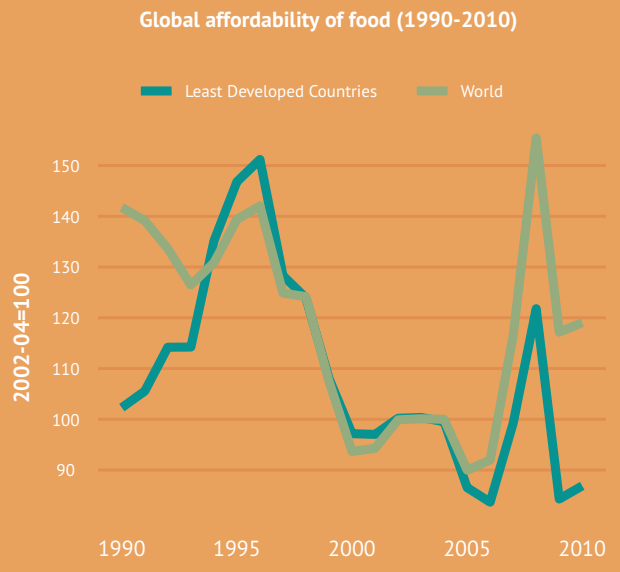
Chart 53: Internationally traded food prices reached record highs in 2010



Source: FAO, Trade and Markets Division

Metalink: P2.HUN.FAO.FPV.FPI, p. 164

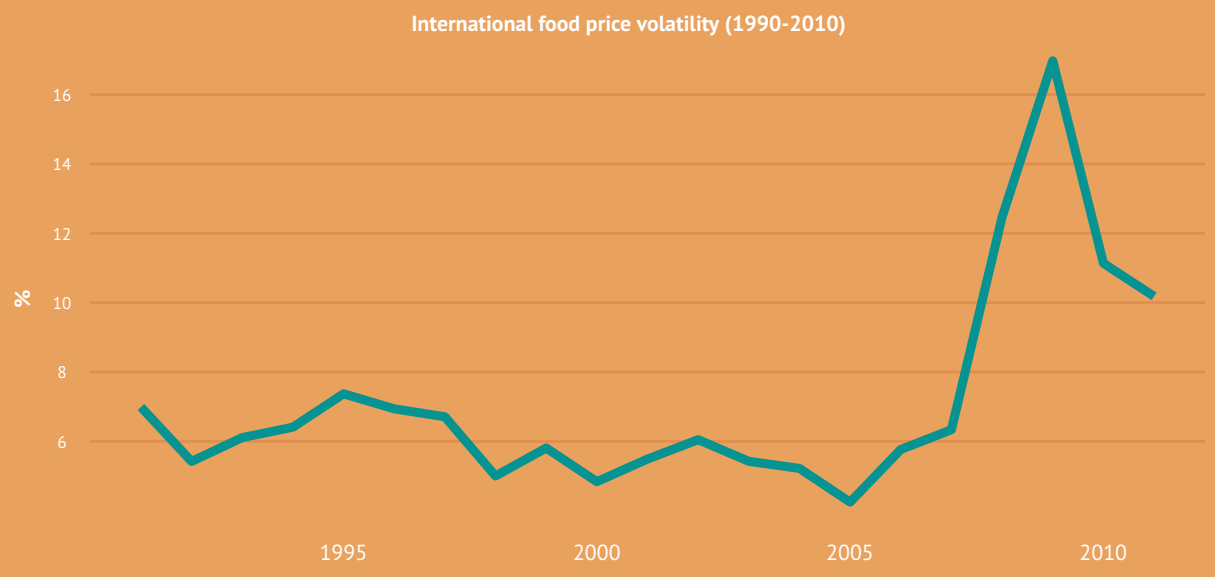
Chart 54: Food prices have risen faster than income



Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.FPV.AFD, p. 164

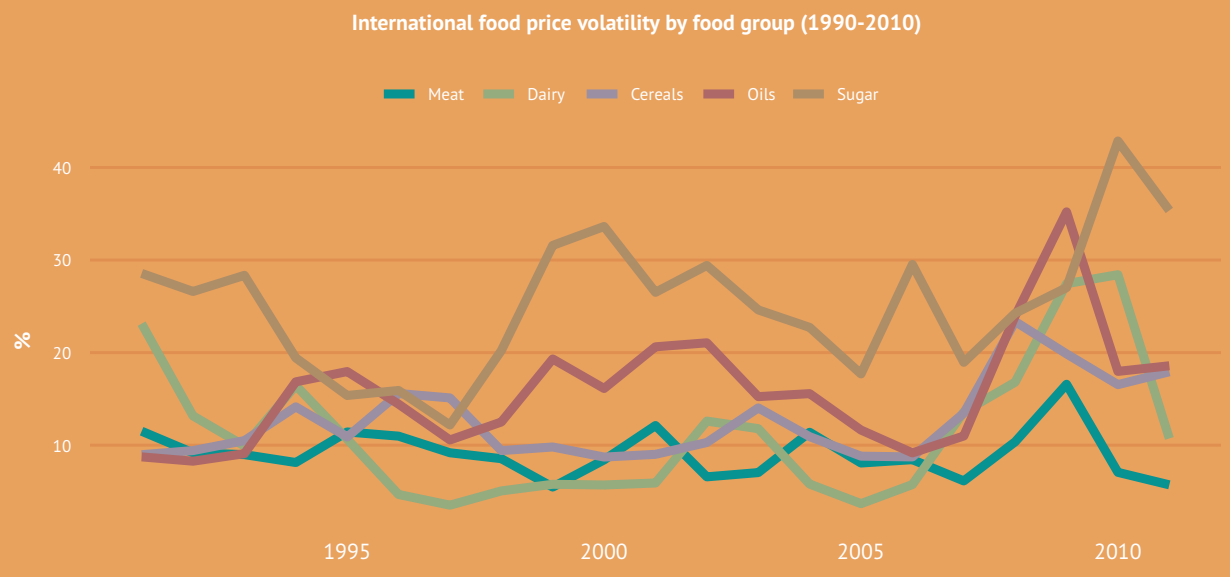
Chart 55: Historical volatility of world reference food prices also reached new heights in 2010



Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.FPV.FPV, p. 164

Chart 56: Of all the prices of major food commodities, global sugar quotations have been most volatile



Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.FPV.FPV, p. 164

According to an IFAD survey of farmers in the Middle East and North Africa conducted in the aftermath of the 2006-08 high price episode, it was found that more than 60 percent of farmers would have expected to increase the area under cereals if prices had remained at the high levels of early 2008. However, the sharp reduction in prices created uncertainty and complicated farmers' decision-making.

With global markets yet again experiencing turmoil over 2010-2011, developing countries must enact measures to protect the most vulnerable, not by fighting volatility, but by managing its risks and mitigating its consequences by providing the poor with access to food. In the long run, vulnerability can be lowered by raising agricultural productivity for a diverse set of both competitive and sustainable crops, as well as by promoting dietary diversification.

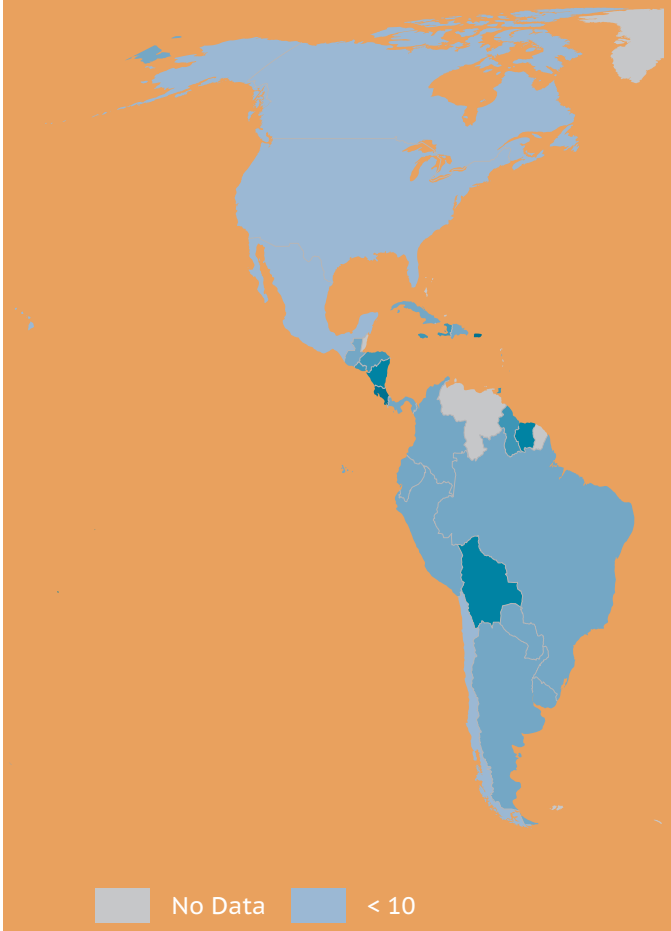
Reducing market uncertainty may not be among the fastest remedies for lowering the number of hungry. Yet, letting international markets continue in their present state, volatile and unpredictable, will only aggravate an already grim outlook for world food security. This is the reason why world leaders have been dwelling at length on the issue of price volatility since the start of the year. Such discussions gained momentum in recent months as attention turned towards finding ways to improve the accuracy of supply and demand forecasts for major food crops as an important first step in promoting stable and transparent food markets.

In June 2011, the Group of 20 (G-20) established a global information system under the banner of Agricultural Market Information System (AMIS). This initiative, proposed by a number of international organizations, has been endorsed by all G-20 Members and, subsequently, by the Committee on World Food Security (CFS).

Further reading

- FAO Global Food Price Monitor (www.fao.org/giews/english/gfpm/)
- FAO World Food Situation (www.fao.org/worldfoodsituation/en/)
- Prakash (2011a)
- IFAD Rural Poverty Report. New realities, new challenges, new opportunities for tomorrow's generation (www.ifad.org/rpr2011/)

Map 26:



Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.FPV.FPVn, p. 164

→ Food price volatility, measured over the past five years, is highest in many of the most food-insecure countries

→ Bouts of high price volatility come at a cost, as market participants have difficulty planning ahead and adjusting to fluctuating market signals

→ Food markets are expected to be more volatile in the future compared to previous decades

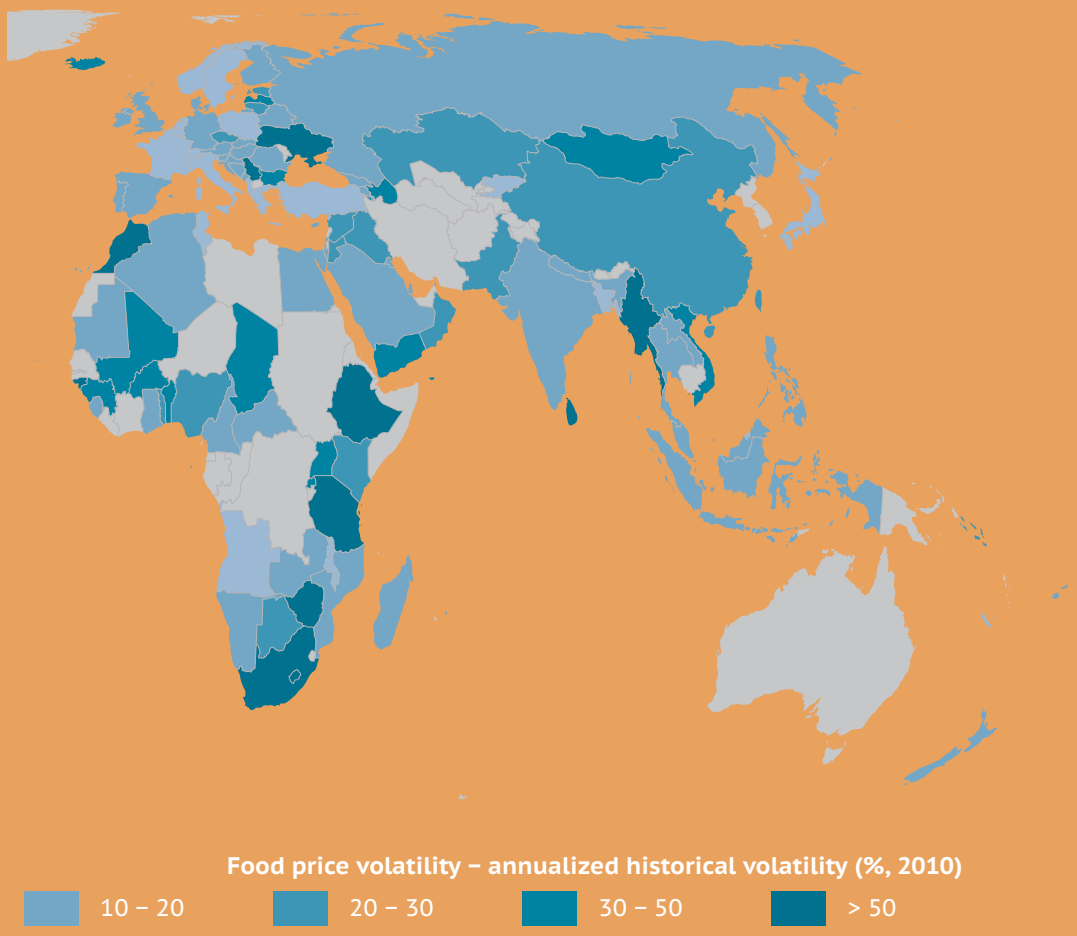
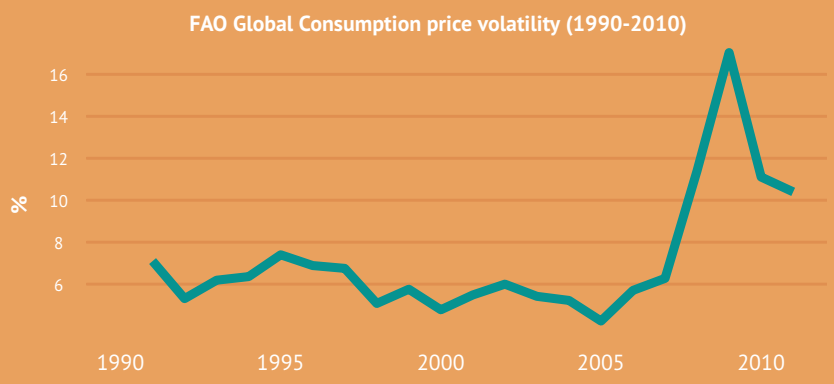


Chart 57: Historical volatility of a typical food basket on the rise



Source: FAO, Statistics Division

Metalink: P2.HUN.FAO.FPV.GCI, p. 164