

Global trends in food security

The international agricultural sector is in upheaval, agricultural prices are soaring. Although this can be explained in part by short-term influences, there are many signs of structural change in the sector. The times of steadily falling food prices are probably over. This will have a serious impact on food security.

The media are full of reports about record prices for agricultural products; the American rating agency Standard & Poor's GSCI index for agricultural raw materials has doubled since the beginning of 2006. Are the times of global overproduction and steadily falling agricultural prices that we have become accustomed to over the past few decades over? Is this, 200 years after it was put forth, confirmation of Thomas Malthus's hypothesis that agricultural production cannot keep up with population growth?

There are four aspects to defining food security: availability, stability, access, and use of food. And these aspects are influenced in turn by income and consumer demand, by production and what the producers offer, as well as by prices and price stability on the food markets. Both governments and the international community of nations will be responsible for compensating for a breakdown of the market. One thing we can be sure of is that serious changes are beginning to emerge in all subsectors that affect the global food situation. Climate change, with its unforeseeable consequences, is a threat lurking in the background for all the subsectors, which are already complicated in and of themselves. At first glance, figuring out how all these factors will interact seems an impossible task. Can workable conclusions about long-term trends be drawn from the cacophony of information?

Dr. Michael Brüntrup
 German Development Institute
 Bonn, Germany
 Michael.Bruentrup@die-gdi.de

Demand trends

First, let us look at the demand side of the food security equation:

- The population will continue to grow until at least 2050. Low estimates see the global population stabilising at around eight to nine billion people, high estimates come up with more than ten billion, with a continuing upward trend. Growth is taking place almost exclusively in developing nations; the population of industrialised nations will shrink unless there is massive immigration.
- Urbanisation of developing nations is advancing rapidly. Currently, approximately half of the human population already lives in cities, by 2030-2050 two-thirds will. With people moving from the countryside to cities demand and consumption patterns are changing radically. One reason for this is that, due to higher energy costs, it is more expensive to prepare food and there is often insufficient space available for food preparation. Quick-cooking and easy-to-prepare products such as rice are used instead of, for example, the traditional millet. In addition, there are multiple cultural and social factors that influence changes to consumer behaviour: new products unknown in the countryside, other ways of preparing food, the influence of advertising in the media, contact with other people and cultures, less tradition-bound resistance to change.
- Income plays a key role in demand for food. While less and less of the increasing household incomes may

be spent on food, the absolute value goes up. In this situation, low-quality products are supplanted by higher quality ones and unprocessed products are replaced by processed products and convenience foods. The value percentage of agricultural raw materials in food shopping baskets goes down to the advantage of integrated services. The rapid income development in Asia has contributed a great deal to the increased global demand for agricultural products, including increasing demand for processed animal products like meat, eggs and milk. These trends can be clearly seen in China, India and other developing nations, even though they follow different consumption patterns. Although the direct per capita demand for staples such as rice is falling in later stages

Rapid urbanisation entails a growing number of supermarkets as new city dwellers change their consumer patterns rapidly.



of economic development, there is no relief for these markets as a whole due solely to the increasing demand for animal feed. In its scenarios for 2050, FAO assumes that per inhabitant there will be an income increase in developing nations of four to five percent on average (between 3 percent in sub-Saharan Africa and 6 percent in Asia). No forecasts have been made about internal disparities, but one can see that the discrepancies between the rich and poor are not going away and a “dead stock” of poverty will develop. The relative percentage of undernourished people has fallen worldwide in the last few years to 17 percent, but the absolute number has gone up slightly to around 830 million people.

- With the growing urban market with more disposable income, standards for safety, hygiene, quality, standardisation and food packaging are going up.
- For standards and norms, and also for advertising and the integration of agricultural value-adding chains, the already established food industry, which is increasingly dominated by global corporations from industrialised nations, has a considerable advantage. Their range of products is heavily influenced by agricultural raw materials from temperate latitudes such as wheat, which causes the overall demand for such goods to go up.

- Demand for renewable raw materials, specifically bioenergy, is starting to boom. This gives a new quality to the competition for food products. The demand has been mostly politically driven, in particular by regulations concerning biofuel blends, both in the industrial nations and in some developing ones. According to projections, the massive increase in the demand for bioenergy could cause agricultural prices to go up by 20 to 70 percent. But this is only part of the problem, because with high crude oil prices the demand, for example from the chemical industry, for other agricultural raw materials will also surely increase, whereby competition with the demand for food would go up more.

Supply trends

On the production side, the trends are even more complex than on the demand side.

- Agricultural area is increasing only minimally worldwide. Large open areas can now only be found in South America and parts of sub-Saharan Africa, but they are often covered with tropical rainforest that should be protected, or the areas are unusable at the moment due to insufficient development and political uncertainty.
- For some time productivity per unit area has been the most important engine driving the ongoing increase in global agricultural production. Recently industrialised nations have lagged behind developing nations, where even greater potentials can be realised. There are large regional differences here, too, though. Specifically, there has been progress in anchor and emerging countries, while in sub-Saharan Africa productivity levels and increases have remained especially low.
- Production factors such as climate, soil and water are no longer reliable parameters. There have been increasing shortages of natural resources for agricultural production, particularly

soil and water. Climate change (see below) could dramatically intensify these trends.

- With high oil and energy prices modern input- and energy-intensive agriculture as a whole is gradually losing competition vis-à-vis input-extensive and labour-intensive production modalities. This could become even more aggravated if agriculture were taxed proportionately to its significant contribution to greenhouse gas emissions.
- While the bioenergy share currently only equals a small percent of the total agricultural production, it is growing rapidly. With current world market prices for crude oil of USD 60 per barrel, Brazilian bioethanol is competitive for now. In industrialised nations the production costs for bioenergy have been too high with the exception of combined electricity and heat generation. With second and third generation bioenergy technologies, which have considerably more efficient yield rates and promise a broadening of the raw-material base, the number of sites that can produce competitively priced bioenergy will probably grow quite a lot (see also article on pages 12-15).
- The role genetic engineering will play in the future development of agricultural production has as yet been unclear. It could probably greatly speed up the process of adapting to new challenges, but there is only limited acceptance of genetic engineering. The world food organisation FAO has a positive opinion of genetic engineering, but many non-governmental and consumer protection organisations argue vehemently against its proliferation based on the ecological and health risks. Different countries are also going down different paths.

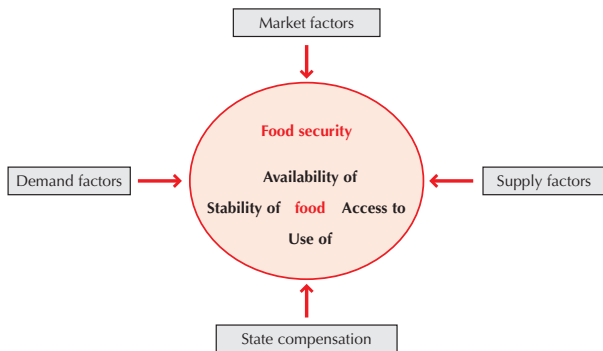
Trends of balancing supply and demand

In addition to demand and supply, the mechanisms for balancing the two play a key role for the future food situation:



Photo: FAO/D. White

Determinants of food security



- Trade liberalisation and exchange rates are two huge unknowns for international agricultural markets. World Trade Organization negotiations are currently stalled, but regional and bilateral trade agreements are flourishing. Thus, international trade is continuing to be liberalised, but on the whole more slowly, unevenly and intransparently than it would be with a multilateral agreement. In the medium terms at least, exchange rates – particularly the dollar, euro and renminbi trio – will probably influence the international flow of goods a great deal.
- High energy prices increase the costs of shipping, trading and processing agricultural products. The prices of bulk commodities such as cereals will go up drastically in importing countries due solely to the latest increases in international freight rates, which have, for example, increased five-fold according to the Baltic Dry Index. This tends to make international markets less attractive than local and regional ones.
- The vertical integration of agricultural markets continues to grow; the large supermarket chains in particular are expanding into developing nations. Factors that have already been mentioned, such as changes in consumption patterns, contribute to this, as does the fact that formerly separate markets are growing closer and closer together with globalisation, and higher quality and safety standards for food. As a result new demands are being made of farmers,

and smaller operators tend to be at a disadvantage.

- The international financial markets have (re)discovered the agricultural sector, including agricultural products and upstream and downstream sectors such as land property and agricultural insurance. This is good for the supply of capital to the agricultural sector and as a risk management tool for commodities trading, but heavily speculative behaviour can also aggravate price fluctuations.
- The warehousing of cereals is one key to stabilising agricultural markets and food security. Global inventories have been falling for years, especially in China; currently there is enough to last around 50 days only. This worsens price fluctuations for cereals, as well as for many other markets.
- Food aid, at approximately 0.3 percent of the global food availability, may be insignificant quantitatively, but it is vital to the food security of many of the world's poorest people. With rising cereals prices even aid becomes more expensive. Food aid is controversial in terms of development policy, because at times of low agricultural prices it was often utilised more as a dumping instrument for surpluses than for real need, among other reasons. With high prices, food aid will become more significant again, but more costly, and it therefore needs to be managed more cost-effectively.

Agriculture will be most affected by climate change. Research and investments are required to secure a survivable agricultural sector.

Climate change – the big unknown

Climate change can alter the global landscape – and with it food security – considerably. Agriculture is one of the sectors most affected by climate change; at the same time the agricultural sector is one of the biggest emitters of greenhouse gases. It might also be able to make a significant contribution to mitigating CO₂ emissions. There is still considerable uncertainty about the extent to which, and with what regional developments, climate change will happen. On the one hand this is due to the lack of available data and details of climate models, and on the other to the lack of clarity about the success of global climate policies. Initial estimates put decreases of the global agricultural potential at 0 to 16 percent by 2080, while losses in the tropics will be contrasted to gains in the temperate latitudes. However, the forecasted losses will be particularly big for the poorer regions of the world, specifically sub-Saharan African and South Asia; in some countries losses of up to 50 percent are predicted. It is estimated that the number of additional starving people will be between 5 and 170 million in 2080.

Conclusion

It is harder than ever to predict how the food security situation will evolve. It is very likely that urbanisation and the



Photo: FAO/Bara

trend towards disparate incomes will continue. If some basic trends, such as markedly higher crude oil and energy costs and continuously high growth rates in many developing nations, are assumed to be given, agricultural prices will go up on an ongoing basis compared to previous decades. The most recent simulations by OECD, FAO, IFPRI, the American agricultural research institute FAPRI, as well as many stock market analysts, have come to this conclusion. With the spread of bioenergy technologies energy prices should, for the foreseeable future, establish a lower limit for the prices of agricultural products, commensurate with their energy content. The rapid structural changes in agriculture could slow down, but probably won't stop. The role of quality and certification will become more important; there is little that can put a halt to vertical integration. Greater price risks call for new risk management instruments, while agricultural protectionism is making less and less sense.

What is needed is innovations, infrastructure, institutions, personnel and organisational capacity, networks, and policies in the agricultural and food sectors that safeguard all this in a way that is focused on poverty, as well as being efficient and lasting. More research and a generally improved

The Double Burden of Malnutrition

More than half of the world's disease burden (measured in „years of healthy life lost“) is attributable to hunger, overeating, and widespread micronutrient deficiencies. 850 million people suffer from undernutrition, and approximately 2 billion people are affected by the “hidden hunger” resulting from vitamin A, iron, and iodine deficiencies. At the same time, an estimated 1.6 billion people are overweight and obese, increasing the risk for many non-communicable diseases (NCDs) such as diabetes, cardiovascular diseases and some cancers. NCDs, misleadingly also referred to as “diseases of affluence” in earlier times, account for 60 percent of deaths worldwide. Surprisingly, almost 80 percent of these deaths occur in low- and middle-income countries. Over- and undernutrition are still perceived to be separate issues. In reality, both are often rooted in poverty and co-exist in communities, and even the same households. Inadequate foetal and infant child nutrition increases the risk for overweight and NCDs in adult life. A “nutrition transition” towards inadequate, energy dense but nutrient poor foods and lack of physical activity further accelerate the risk. In 2004, the World Health Assembly issued a Global Strategy on Diet, Physical Activity and Health, calling upon all stakeholders to take action at global, regional and local levels. However, despite of the impact of the obesity epidemic and diet-related chronic diseases on mortality, morbidity and national economies, political and financial commitment is still lacking and allocation of resources to nutrition activities is disturbingly low.

Further information: Standing Committee on Nutrition (SCN).

Tackling the Double Burden of Malnutrition. A Global Agenda. No. 32, 2006
FAO. The double burden of malnutrition.

Case studies from six developing countries. FAO, Rome, 2006

Birgit Kubelka, gtz, Eschborn

ability to adapt when managing natural resources are also needed with regard to climate change. Investment in the agricultural sector is being viewed economically again; the social components of agricultural supports as a replacement for fighting poverty independent of the sector and food security

will become less significant. The latter continues to be relevant, though, because the majority of poor people will continue to live in rural areas, principally off agriculture. The net losers of higher agricultural prices, that is primarily the urban poor, require special measures.

Zusammenfassung

Zurzeit steigen die Preise für Agrarprodukte rapide an. Während ein Teil des Preisbooms konjunktureller Natur ist, gibt es eine Reihe von Argumenten dafür, dass ein weiterer Teil durch strukturelle Änderungen des globalen Agrar- und Nahrungsmittelsektors verursacht wird. Die Menschheit muss sich nach einer langen Periode sinkender Nahrungsmittelpreise darauf einstellen, dass Nahrung wieder teurer wird und Ertrags- und Preisschwankungen zunehmen. Dies wird gravierende Auswirkungen auf die Ernährungssicherung vor allem in den ärmsten Ländern und Bevölkerungsschichten haben. Es wird aber auch zu neuer Attraktivität von öffentlichen und privaten Investitionen in der Landwirt-

schaft führen. Diese Attraktivität gilt es zu nutzen – für armutsorientiertes Wachstum in Entwicklungsländern mit entsprechendem Potenzial. Gleichzeitig müssen Anstrengungen unternommen werden, die Ernährungslage unter den neuen Gegebenheiten zu sichern und die Agrarmärkte zu stabilisieren.

Resumen

Actualmente los precios de los productos agrícolas vienen aumentando con rapidez. Mientras que parte del alza de precios es de naturaleza coyuntural, existe una serie de argumentos según los cuales otra parte se debe a cambios estructurales en el sector agrario y alimentario a nivel global. Después de un largo período de baja en los precios

de los alimentos, la humanidad deberá habituarse nuevamente a una alimentación más costosa y a mayores fluctuaciones en el rendimiento y los precios. Esto traerá consecuencias decisivas para la seguridad alimentaria, sobre todo respecto de los países y estamentos poblacionales más pobres. Sin embargo, también conducirá a un mayor atractivo de la agricultura para las inversiones públicas y privadas. Será importante aprovechar este atractivo para orientar el crecimiento hacia los pobres en aquellos países en desarrollo con el correspondiente potencial. Al mismo tiempo, habrá que emprender esfuerzos para asegurar la situación nutricional bajo las nuevas condiciones y estabilizar los mercados agrícolas.