Source: Urs Wiesmann

Fact sheet Rio+20

Fact sheet No. 4, 2012

Source: NASA

Food security for a planet under pressure – and the challenges for Switzerland

Hunger and malnutrition are among the greatest challenges regarding human health and sustainable development. Today, the number of hungry people in the world exceeds the combined population of the USA, Canada and the European Union. All the same, the challenge of feeding the world is considered to be achievable provided that the global community acts decisively.

The Challenge

Over the past half-century, global food production has markedly increased. Thus, the share of undernourished people decreased from 1970 to 2008. However, the number of hungry people increased again after the food price rises in 2007/08, from about 800 million to one billion. Another billion people lack adequate nutrition. Continuing population growth, limited natural resources and changing food habits in transition and developing countries are likely to raise global food demand even more. Meeting this demand will be further complicated by changes in environmental factors.

Yet food insecurity is not simply a problem of supply. In fact, never before has so much food been produced and the world currently produces sufficient food for all. However, unequal distribution, differences in purchasing power and food waste are crucial factors contributing to the discrepancy between production and consumption. It is estimated that today, between 30 and 50% of all food grown worldwide is lost or wasted before or after it reaches consumers. Furthermore, alternative uses of agricultural land, e.g. the production of biofuel or livestock feed, are competing with food production.

Meeting the demand in the markets will not necessarily address the food needs of the poor. The food-insecure remain so largely because their incomes are too low or prices are too high, and food price volatility will continue to affect the poorest the most. In many vulnerable parts of the world, poor governance and armed conflicts aggravate the situation.

Current and expected future developments

Food and health

Improving the health of the world's poorest requires the production and supply of sufficient, adequate and safe food. Malnutrition and chronic undernourishment have devastating effects on human health, particularly on the development of children. About one billion people are estimated to suffer from 'hidden hunger', which means important micronutrients are missing from their diet. On the other hand, as transition and developing countries become wealthier, their food habits tend to adopt Western patterns, i.e. higher consumption of fat, sugar and salt and an increasing amount of processed food, meat, fish and dairy products. Thus, for in-

sc | nat

Swiss Academy of Sciences
Akademie der Naturwissenschaften
Accademia di scienze naturali
Académie des sciences naturelles

This fact sheet prepared by ProClim–, KFPE, the Platform Biology and the Forum for Genetic Research is inspired by the Planet under Pressure Policy Brief series: www.planetunderpressure2012.net/policybriefs.asp

stance, in China meat consumption has increased by a factor of 2.5 since 1990. The westernisation of diet gives, inter alia, rise to widespread obesity. Furthermore, such food often has a larger environmental footprint.

Population growth

The world's population is projected to grow from 7 billion people today to 9.3 billion by 2050. Continued population growth remains one of the biggest challenges to global food security. According to the FAO, worldwide food and fodder production will have to increase by an estimated 70 % by 2050. Later, population growth can be expected to slow down, primarily due to more effective family planning.

International trade and subsidies

Industrialised countries tend to promote free international trade and put pressure on developing countries to abandon import restrictions. At the same time, they protect their own markets by means of such import restrictions, subsidise their own agricultural production and promote the export of surplus production. Increasingly, local farmers in developing countries lose their markets and are forced to constrain production to meet their own needs or to give it up completely. As a result, entire countries become dependent on imports.

Natural resources

In the past 50 years, the natural resource base has declined faster than ever before. About 75 % of agro-biodiversity has already been lost, about one third of the world's cropland is degraded and water scarcity is expected to increase dramatically in the future. These changes will severely constrain agricultural production, with livelihoods depending on small-scale farming, adaptation to climate change and climate resilience. Lack of genetic resources will limit the scope of farmers and researchers to adapt crops to climate change.

Climate and environmental change

Global environmental change compromises food security for those already prone to hunger, i.e. particularly people in developing countries. Among the environmental factors, climate change is one of those currently subject to intense debate. Agricultural production itself contributes to climate change, e.g. through greenhouse gas emissions from ruminants or rice production. Climate change will affect food security due to more frequent and intense incidents of extreme weather, changing patterns of rainfall and increasing heat stress. Further environmental factors include increasing pests and diseases, soil degradation and biodiversity loss.

Land-grabbing

Changing consumption patterns give a boost to the demand for resources, i.e. land, water, energy, and may affect other regions of the world. Africa is the prime target of so-called land-grabbing, i.e. the purchase or rent of land by foreign investors, accounting for more than 134 million hectares. Often, the best land is being targeted for acquisition. In Africa, about two thirds of the acquired land is used for biofuel production.

Biofuel production

The increasing demand for energy enhances the production of biofuels, which are based on agricultural commodities. Production increased more than threefold from 2000 to 2008 and now accounts for nearly 2 % of the world's consumption of transport fuels. In 2007/08 total use of coarse grains for the production of ethanol amounted to 110 million tons, which means a share of roughly 10 % of the entire harvest. Of particular concern is the fact they there might be adverse effects on the food security of the poor if food prices were to rise again due to the production of feedstock crops for biofuels.

Meeting the challenge of food security

- The food system of the future will need to match changing patterns of food supply and demand in ways that are economically viable as well as environmentally and socially sustainable. This includes an efficient use of resources and waste reduction throughout the food chain.
- Policies and technologies promoting sustainable production practices are called for, particularly with regard to land and water management, and the use of non-renewable resources. Adapting to climate change and reducing the environmental footprint of agriculture requires policy support and innovation.
- Pricing policies have to take into account environmental services provided by the agricultural sector as well as its ecological footprint.
- A transition to healthier diets is needed, both in industrialised and in developing countries. In developing countries the focus should be on increasing the purchasing power of the poor. Educational efforts are required in all countries to meet the challenges of malnutrition and obesity.
- Protection of the most vulnerable groups from the worst effects of food price volatility and price increases should be a priority.
- Agriculture in developing countries – especially small-scale farming, which still is the livelihood of 40 % of the global population and accounts for 70 % of global food production – will have to play a major role in feeding the world. Industrial agriculture supplying the world market is also important.
- Agriculture and the food supply chain have to provide opportunities for decent income generation and rural employment. This is primarily a task for the national governments, but also for the global trading partners, who should ensure that local producers obtain an adequate profit.
- In particular, governments and the private sector need to invest increasingly in agriculture, rural development and food systems whilst observing the principles of sustainability.

The role of Switzerland

How can Switzerland contribute to global food security? The opening of international markets and the resulting structural changes, the impact of climate change and the increasing scarcity of resources do not only have international consequences, but also affect Switzerland. What role should Switzerland play in the global food market?

The challenge

Switzerland currently has a degree of self-sufficiency of 50 to 60 %. Thus, Switzerland depends on international markets and profits from the international food supply. There are different views of what consequences a further market opening would have on the Swiss food industry. Export-oriented companies are likely to profit, domestically oriented companies would be confronted by new challenges. Swiss agriculture is rather critical towards a further opening, because the prices of easily transportable agricultural commodities would decrease.

The globalisation of markets may widen or narrow the global prosperity gap. The goals of sustainability, i.e. an environmentally friendly and socially responsible economic development in the North as well as in the South, can only be achieved if industrialised countries and emerging economies are not the only ones to profit from the market opening.

In terms of food security, and in comparison to the related global challenges, Switzerland is in a favourable position in many respects. This applies to the current and future food situation as well as to food production. It is nevertheless important for Switzerland to deal with the global consequences of climate change, the increasing scarcity of land and the future of Swiss agriculture.

Expected future development

Global food situation

Price fluctuations are expected to increase on the world market due to production losses caused by more intense extreme meteorological events in major export countries. This will result in supply problems in poor import countries. Furthermore, fluctuating prices of agricultural products make them interesting for speculation on the financial markets, which tends to increase the volatility of prices. In comparison to poor import countries, Switzerland will remain in a favourable position: Supply problems are not to be expected, because Switzerland can pay to cover its food demand by imports. In order to contribute to global sustainable development, Switzerland needs to use its own agricultural resources sustainably and also to strive for fair trade. Fair trade products distinguish themselves by ensuring an adequate participation in profits for the producers. Therefore, it will become increasingly important to inform the public comprehensively and transparently about how, where and by whom imported food has been produced.

International market opening

There are different scenarios for the development of the Swiss food market: (1) a creeping opening of the market, resulting from increasing shopping tourism, domestic processing arrangements and sectorial tariff reductions within the framework of free trade agreements with non-European partners, (2) a progressive and controlled opening of the market with the European Union (EU) by means of a free trade agreement for the agricultural and food sector, (3) a global agreement within the framework of the WTO Doha round and (4) a combination of free trade with the EU and WTO Doha. The consequences for the food industry will depend on the scenario, on the one hand, and on the geographic range and the size of enterprises concerned, on the other hand. Swiss agriculture is predominantly critical of a further opening of the markets. Due to high production costs, Swiss products are competitive only to a limited extent on the international market. However, closing off the Swiss market vis-à-vis foreign trade would deteriorate the competitive situation for Swiss agriculture and is no long-term option. This makes it all the more important to gain a competitive advantage by focusing on high product quality.

Scarcity of land resources

In Switzerland the area under agricultural use is decreasing. An average of 2200 hectares of agricultural land has been abandoned per year since 1996, corresponding to more than 3000 football fields. The pressure on agricultural land will remain high due to population growth and the increasing living space per person. In addition, there are ecological demands (ecological compensation areas), but also space requirements for leisure activities and local recreation.

Figure 1: Due to the expected increase in dry periods, the need for irrigation will rise.
(Photo: J. Fuhrer, Agroscope)

Climate change

In Switzerland a moderate climate warming of less than 2 to 3 °C by 2050 will presumably have an overall positive effect on agriculture. Provided that the nutrient and water supply is sufficient, the potential annual production of pastures and the potential yield of many agricultural crops will not decrease. In addition, opportunities will arise from new, alternative crops and varieties as well as from the relocation of production. The significance of irrigated agriculture will increase. Negative effects are expected due to more frequent and longer hot and dry periods and due to the increased occurrence of weeds and insect pests. In the case of a warming of more than 2 to 3 °C by 2050, the production risks will outweigh the positive effects in Switzerland as well.

Measures and possible solutions

- Whereas Switzerland and other Central European countries will profit from climate change in the short and medium term with regard to agricultural productivity, other countries, for instance in sub-Saharan Africa, are already enduring the impact of climate change. Solidarity between the countries of the North and those of the South will become even more important. Trading conditions, subsidy policy and pricing are to enable fair trade with producers from the South (and the East). This will require stronger integration and concordance of development policy and agricultural policy, as well as support in the form of innovation and knowledge transfer.
- Switzerland has the potential to help reduce food shortages in vulnerable countries by supporting the establishment of adequate and efficient training structures for the agricultural and food sector and by fostering research as well as technology and knowledge transfer.
- The continuation of a Swiss agricultural policy focusing on sustainability contributes to global food security.
- In order to ensure the conservation of natural resources, consumers have to be made more aware of the environmental impacts of food. Supernutrition, losses during processing food and food waste should be reduced by taking adequate measures.
- A further opening of international markets will require adaptations in Swiss agriculture. These adaptations are to be made in a socially and environmentally responsible way.
- Land is a scarce resource in Switzerland. Thus, more economical and more careful land use is required. The different demands (living space, agricultural area, compensation areas, space requirements for leisure activities and local recreation) must be balanced against each other.
- Based on relevant research, Swiss agriculture needs to adapt to climate change by way of plant breeding, adequate variety selection, cultivation methods, farm management and irrigation. The irrigation water available needs to be used as efficiently as possible.

Bibliography

Food security for a planet under pressure. RIO+20 Policy Brief #2. One of nine policy briefs produced by the scientific community to inform the United Nations Conference on Sustainable Development (Rio+20). 2011.

Anseeuw, W., L. Alden Wily, L. Cotula, and M. Taylor, 2011. Land Rights and the Rush for Land: Findings of the Global Commercial Pressures on Land Research Project. ILC, Rome.

Gustavsson, J., Cederberg, C., Sonesson, U., van Otterdijk, R. & Meybeck, A.FAO, 2011. Global food losses and food waste: extent, causes and prevention. (Study conducted for the International Congress "Save Food!" at Interpack2011, Düsseldorf, Germany)

International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), Global Summary for Decision Makers. Accessed online 23 September 2008.

Steinfeld, H., H. A. Mooney, F. Schneider, L.E. Neville (ed). Livestock in a Changing Landscape: Drivers, Consequences and Responses. Island Press, Washington, DC.

Bundesamt für Landwirtschaft, 2011. Agricultural Report. Bern.

Contact persons (Global aspects):

Barbara Becker, bbecker@ethz.ch
Managing Director, North-South Centre, ETH Zurich
Hochstrasse 60a, CH-8092 Zurich

Markus Giger, markus.giger@cde.unibe.ch
Centre for Development and Environment (CDE)
University of Bern, Hallerstrasse 10, CH-3012 Bern

Contact persons (Switzerland):

Jürg Fuhrer, juerg.fuhrer@art.admin.ch
Research Station Agroscope Reckenholz-Tänikon ART,
Location Reckenholz, Reckenholzstr. 191, CH-8046 Zürich

Fritz Schneider, fritz.schneider@bfh.ch
Bern University of Applied Sciences, School of Agricultural, Forest and Food Sciences HAFL, Länggasse 85, CH-3052 Zollikofen

Fact sheets dealing with other topics can be downloaded at: www.scnat.ch/e/Publikationen/rio+20/index.php?

Editor: Esther Volken, ProClim–, Forum for Climate and Global Change, Schwarztorstr. 9, CH-3007 Bern, www.proclim.ch