

Biofuels and the global food crisis: a dangerous or a new opportunity?



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Agricultural commodity prices are rising sharply on the global markets: in early 2008 the UN Food and Agriculture Organization (FAO) index stood 53 per cent higher than a year before. In particular, the vulnerable countries are suffering from higher expenses for food imports and higher food insecurity. But in the 'rich' countries, agriculture has become less dependent on their traditional public subsidies, thus opening up new perspectives for a world trade agreement. The World Bank, the IMF and others have concluded that rising biofuel production is responsible for a significant part of the jump in commodity prices. On the other hand, a combined expert meeting at a major FAO Congress on World Food Security in June 2008 underlined the opportunities that biofuel production presents for agricultural and rural developments.

Agricultural commodity prices started to rise sharply in 2006, reaching new records in the first months of 2008. Globally, the import bill for foodstuffs in 2007 increased by 29 per cent; this, in combination with an even more dramatic price increase for all conventional energy sources such as oil, coal, gas, and uranium on the global markets, became an economic and social disaster for many countries, in particular for the low-income, net importing countries. Dozens of them import all their petroleum needs and a major part of their demand in grain: 30 per cent of their population suffers from chronic hunger.

What were the reasons behind this revolutionary development? According to many commentators in the spring of 2008, the diversion of agricultural production from food use to biofuels had caused a very large part of the increase. A report of the World Bank concluded that 65 per cent of the price rise of agricultural commodities was due to biofuels, and the International Monetary Fund (IMF), too, found biofuels responsible for a significant part of the price jump. The 10 per cent biofuel target for 2020 defined in 2007 by the European Union (EU) heads of states and governments came under attack in the European Parliament.

A more thorough analysis of the situation came with the UN Food Summit, the 'High-level Conference on World Food Security: the Challenges of Climate Change and Bioenergy' organised by the UN Food and Agriculture Organization (FAO) in Rome, 3-7 June, 2008. It took a much more balanced view on all the reasons of the current food crisis, and will serve as a basis for the rest of this article.

Finally, the Doha Round negotiations of the World Trade Organisation of July 2008 in Geneva got at last a new perspective for achieving a global trade agreement: the subsidies allocated traditionally in the US, the EU and other OECD countries on agriculture could be waived at least in part as a result of higher prices on the world markets; the removal of the distortions of agricultural subsidies are a good basis for a more efficient and fair global trade. Although the Doha Round had agreed already to dispense with all export subsidies worldwide by 2013, eventually that negotiation in Geneva failed, but it seems that the main argument for disagreement was on cotton, not on cereals.

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The price increase of the agricultural commodities on the global markets

It is interesting to note that since the first oil price shock in 1973, global commodity prices follow by and large the ups and downs of the crude oil market price. More recently, as for oil, commodity prices have started to increase since the beginning of the century. Nevertheless, in real terms, commodity prices are today still lower than in the early 1970s.

A spike in global commodity prices started in 2006. The UN-FAO commodity price index for the first three months of 2008 stood 53 per cent higher than a year before. The global food commodity price index of the IMF jumped between April 2007 and April 2008 by 45 per cent; it includes everything from cereals, vegetable oils, seafood to bananas. The global price of maize, a commodity that goes (among other things) into biofuel production in the US, increased over-proportionally by 62 per cent; soybeans, the other feedstock for biofuels, increased even more: 79 per cent.

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The impact of these commodity prices on retail food cost to consumers varies from country to country. For instance in Germany, the cereal price accounts only for four per cent of the cost of bread. In the United States the commodity price accounts on average for 20 per cent of the retail food cost to consumers. In the developing countries it tends to be higher.

Biofuels, as far as they are concerned, depend more directly on the market prices of the input commodities. For biodiesel from rapeseed it is 64 per cent; bioethanol, if produced at the current US corn price of approximately US\$4 per bushel, can compete on the market – leaving alone the subsidies – with a crude oil price of US\$100 per barrel.

Rising food prices and the poor

Following data from the FAO, world cereal production is expected in 2008 to increase by 2.8 per cent compared with 2007 (2,180 million tonnes), thus continuing the slight growth from 2006. (Even accounting for the 30 million tonnes of additional corn going into biofuels, we will have this year a net 30 million tonne increase of global cereal harvest for food). Production in Africa will increase this year by more than seven per cent. The EU will in 2008 harvest 15 per cent more wheat than the year before. Despite the rise of global prices, imports of cereals are also increasing: Africa with a share of 22 per cent of global import of cereals will import five per cent more this year, with an import bill 23 per cent up. China and India are often cited as the main reason for the current spike in commodity prices: the fact is that their import of cereals is trending downwards, and has done since 1980. The United States, the world's biggest cereal exporter, is not decreasing its exports despite the higher domestic consumption of biofuels.

A working document of the FAO finds that one would expect high cereal prices to reduce consumption and countries with high levels of under-nourishment would be of particular concern. However, data have not

shown a decline of the food use of wheat, rice or maize on a per capita basis. This trend is the same for most low-income countries, including those with high levels of undernourishment. Current trends suggest that given the importance of cereals as a major source of energy intake in the family, cereal consumption is highly inelastic to price increases.

The number of hungry people may not be on the rise, but eradication of chronic hunger falls by the wayside; and over all, maybe not hunger, but poverty increases: for more than a billion people in the developing world, spending power may be reduced by around 20 per cent.

In the low and lower-middle income countries, the increase in the cereals import bill threatens macroeconomic stability, implying a widening of the current account deficit as a share of GDP by up to three per cent. Some of these countries could have severe balance of payment problems. Countries like Eritrea, Niger, Comoros, Botswana, Haiti, and Liberia are suffering in particular; they are especially vulnerable as they import all their petroleum and more than two-thirds of their grains, while half of the population suffers from chronic hunger.

Even in Europe, the US, and other OECD countries, the jump in commodity prices in 2008 has led to a dramatic increase of the inflation rate and a reduction of GDP growth.

Stock levels have been reduced on average by 3.4 per cent a year since the mid 1990s. This reduction has come about in the major exporting countries through several factors, such as high storage costs, lower reserves held by public institutions, and better information and transport technologies.

Reasons behind the price rise of global agricultural commodities

On the supply side, global production volumes of cereals have remained stable since 2006, as explained above. Following the FAO, the sharp increase in 2008 is rather a short-term reaction to policies applied in some countries that reduced export availabilities; while many countries like Japan impose import restrictions on rice (for instance) of up to 100 per cent, others like Argentina impose export restrictions on agricultural commodities.

However, global supplies are certainly affected by other reasons, too; in particular the gradual reduction of stocks is to blame. Stock levels have been reduced on average by 3.4 per cent a year since the mid 1990s. This reduction has come about in the major exporting countries through several factors, such as high storage costs, lower reserves held by public institutions, and better information and transport technologies.

As a result, and in the absence of buffer supplies, international markets become tighter, and small price changes become magnified when unexpected events occur. Cereal stocks are expected to decline further in 2008 to a 25-year low. There are then spill-over effects from cereals to other markets, combining with the effects that originate from the sky-rocketing crude oil markets.

Production costs of commodities have been increased as a result of higher energy costs, too: the price of some fertilisers increased by 160 per cent in early 2008; freight rates doubled in a period of just one year.

Furthermore, the commodity markets with increasing returns became a magnet for speculators; now the derivatives markets based on agricultural commodities (as well as those for crude oil) have increased portfolio diversification and reduced risk exposure – as long as global prices continue their upward trend at least.

What then, was the effect of biofuel development on the commodity price hike in 2007 and 2008?

Modern biofuels in the global agriculture of today

The crops currently employed for bioethanol production are sugar cane in Brazil and other tropical and sub-tropical countries, corn, the preferred crop in the United States, sugar beat, wheat and barley that are leading the bioethanol markets in Europe. Vegetable oils for transport and biodiesel are produced from palm oil (Malaysia), soya oil (the Americas), and rapeseed oil (Europe). Rice, sunflowers, potatoes, wine, etc. are not employed for commercial fuel production.

It is worth mentioning that there is a considerable international trade for biofuels already.

How do the increasing amounts of the commodities that go into biofuels contribute to the current price hikes on global markets?

The question is then, how the increasing amounts of the commodities that go into biofuels contribute to the current price hikes on global markets.

A thorough estimate of the impact of US biofuel production on global foodstuff prices is available from the US Departments of Agriculture and of Energy: the US Administration estimates that the IMF global food commodity price index increased last year by 10 per cent due to alcohol and biodiesel production.

A good indicator of the impact of biofuel production on global food prices is the evolution of exports from the producing countries.

The United States has maintained the level of its corn exports and even increased it despite the jump of domestic biofuel production which has tripled over the last three years.

Sugar export from Brazil is not much affected either, even though half of the Brazilian sugar production goes into alcohol for transport covering almost half of the domestic petrol market.

The global price of oils and fats follows closely the evolution of the cereals market. But only less than 10 of global oil production is devoted to biofuels. By far the most productive crop for oil is palm oil that is mainly produced in Malaysia and Indonesia: 15 per cent of Malaysian palm oil is exported as biofuel.

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It is important to note that the larger amounts of feedstocks going into biofuels are entailing the production of equally large amounts of protein feeds namely from corn and from rapeseed; this is supposed to have a dampening effect on the price of global protein feeds.

In conclusion, of the cumulative 200 per cent global price increase for cereals and oils we have witnessed over the last three years, the production of biofuels, although increasing rapidly, tends to account for not more than 10 to 20 percentage points; it is by no means the dominating factor.

Outlook

Farm production

In the 1980s and 1990s, the 'rich' countries dumped huge farm surpluses on global markets, depressing prices and return on investment. Developing countries reduced their spending on the 'green revolution'; public expenditure on farming has fallen by half in the last 25 years.

Focus in the future must be on enabling farmers to apply sustainable technologies for agricultural intensification. China and India are progressive in that respect, as they succeed on a large scale in feeding their ever-increasing populations from domestic resources: India feeds 17 per cent of the global population on three per cent of the world's farmland.

Generally speaking, the 450 million smallholder farmers in developing countries must become involved in a global policy to increase supply. It is more cost-effective to increase grain yields in Africa from two to four tonnes per hectare than it is to raise them in Europe from eight tonnes to 10. In Africa seeds are scarce, as they are too costly for many farmers; and fertilisers are on average employed at nine kilogrammes per hectare compared with 150 kilogrammes in Asia.

In addition, in Russia and Ukraine, crop yields could be increased by a factor of three, according to the FAO.

There is also the opportunity now to put arable land back in production, not only in the EU, where the common agricultural policy supports a 10 per cent set-aside regime for all farmland. The FAO found that in Africa, only 14 per cent of arable land is under cultivation; for Russia, Ukraine and Kazakhstan at least 13 million hectares could be returned to production.

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Biofuel markets in the future

Biofuel markets, as far as they are concerned, are currently driven by policy measures in the OECD countries to promote farm income, energy independence and security, climate change mitigation, and rural development. This being said, we have also to take note of some important markets in emerging economies, such as Brazil and Malaysia, where modern biofuels compete in the open market without subsidies.

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All current biofuels markets are based on the use of agricultural feedstocks. Cellulosic feedstocks such as solid residues and woody material are considered promising for production of 'second generation' biofuels, as alternative feedstock to sugar, starch and oils and fats; they are for instance part of the US strategy as decided through the Energy Independence and Security Act of 2007. However, second generation biofuels are not currently commercially viable and may not be for years to come. As an FAO expert group put it, "building policy on technological assumptions that have not been fulfilled is risky."

And there are those who believe in alternative agricultural crops, as for instance sweet sorghum, a fast-growing plant for sugar, or jatropha oil production in semi-arid regions.

In general terms, the combined expert group at the UN Food Summit of June 2008 in Rome identified the potential opportunities that biofuel production presents for agricultural and rural development. As, following the IEA, reliance on fossil energy is not sustainable, bioenergy, in its various forms, has the potential to meet, at least in part, growing energy demands, they say. "Biofuels need to be put in the context of the total energy mix, including other renewable energy sources and energy efficiencies." There is a need to link food and fuel policies, so as not to compromise food security, or to deprive poor farmers of potential gains from biofuel development.

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The World Council for Renewable Energy (WCRE) is a global voice for Renewable Energies. Its objectives include communicating the urgent and global need for renewable energies and their availability for all energy demands; analysing the international barriers to renewable energies and preparing proposals to overcome these; documenting experience of initiatives and communicating best-practice examples world-wide; and evaluating the advanced technological opportunities and applications of renewable energy technologies.

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