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FOOD SYSTEMS AT RISK

NEW TRENDS AND CHALLENGES

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Sandrine Dury,
Pauline Bendjebbar,
Étienne Hainzelin,
Thierry Giordano
and Nicolas Bricas (Eds)

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CHAPTER 5.2

RISKS OF HIGHER FOOD PRICES ON INTERNATIONAL MARKETS

Thierry Brunelle[1] and Patrice Dumas[1]

SUMMARY

Agricultural commodity prices have increased since the early 2000s in response to a combination of causes on the demand side (demographic growth, increased animal product consumption in emerging countries and biofuel mandates) and on the supply side (the phasing out of agricultural policies subsidising food supply in the European Union and United States, lack of public investment in agriculture, reaching ceilings in cereal yields in already high-yield countries and an increase in energy prices). The succession of food crises between 2008 and 2012 has brought the agricultural price regime and its implications for food security back to the forefront. Even though the increase of average agricultural prices could profit some farmers, part of the price increase corresponds to increased costs and urban dwellers, as well as many food-insecure food producers, depend on the market for their supply. In addition, environmental policies concerning the protection of biodiversity, climate mitigation and pesticide reduction could make these issues even more acute.

1. CIRAD, UMR CIRED, F-34398 Montpellier, France.

Will high prices be the 'new normal'?

Following the food price peaks at the turn of the 2010s, debates have emerged on what the 'new normal' will be for the long-term trends in agricultural prices. An optimistic view has argued that the long-term trend in food prices should remain downward (Baldos and Hertel, 2016). This argument is based on an analysis of the main determinants of agricultural supply and demand: population, per capita income, diet, climate change, agricultural productivity and biofuel production among others. According to Baldos and Hertel (2016), the deceleration of population growth to 2050 and its concentration in developing countries, where per capita food consumption is relatively low, should more than offset the effect of global growth in per capita income. Moreover, growth in agricultural productivity should not necessarily weaken because substantial margins for growth remain in many countries around the world (Foley *et al.*, 2011), and the effects of climate change will be felt mainly after 2050 (Rosenzweig *et al.*, 2013). Finally, demand for biofuels, which has driven agricultural prices since 2000, is not expected to change significantly given the criticism of its environmental impact and the low price of fossil fuels.

However, there are several risk factors to consider that may temper this optimism. First, the UN's demographic projections have recently been revised upwards (*cf.* Chapters 1.3 and 5.1). Changes in animal product consumption could also outpace income-based projections. The uncertainties are important. Given current population levels, there is a potentially huge multiplicative effect of changes in diet per capita if the traditionally vegetarian population of South Asia, in particular India, adopt Western consumption patterns. There are also concerns about the potential for future productivity growth (*cf.* Chapter 5.1).

It is equally important to highlight the important correlation between agricultural prices and energy prices. Optimism about the evolution of agricultural prices is largely based on the assumption of moderate growth in energy prices. If energy prices were to increase, in particular because of the increased scarcity of fossil fuels, there is a risk of a spill-over effect through the price of inputs, particularly fertilisers whose production process is energy intensive (Brunelle *et al.*, 2015), or through the demand for biofuels. Climate policies in line with the Paris agreement objectives could also lead to increased energy prices as some relatively cheaper conventional and unconventional fossil fuel sources would be left untouched in order to avoid climate change.

In recent years, international trade has played an important role in moderating agricultural prices, in particular in responding to isolated shocks in production (for example, France in 2016).

However, increased trade flows tend to polarise situations with some regions taking an increasing share of the world market, particularly South America, while others are increasingly dependent on imports, such as Africa and China (Kastner, Erb and Haberl, 2014). The geo-political context will be a key determinant of how countries cooperate to ensure the global food balance. The hypothesis of regional fragmentation leading to trade wars, as is currently the case with the soybean trade between the US and China, could profoundly change the long-term dynamics of agricultural prices.

Food prices under scenarios of stringent climate change mitigation and environmental preservation

Over the past few decades, low-cost food and plentiful production have been the main outcomes expected from food systems. If environmental issues now become a higher priority, there is a risk that food prices will rise on international markets in the coming decades.

The most ambitious climate change mitigation scenarios are largely based on the agriculture, forest and other land-use sector (AFOLU), because the mitigation potential, whether through reduced emissions or carbon sequestration, is large and the costs of abatement are low compared to other sectors (Krey *et al.*, 2014). Such a mitigation strategy may have major implications for our food future as research shows that the introduction of a carbon tax on the AFOLU sectors could have greater consequences for food security than the impact of climate change itself by 2050 (Hasegawa *et al.*, 2018). However, it is important to note that these conclusions are based on assumptions that are not favourable for food security since in most models carbon tax revenues are not properly redistributed to the people affected in the modelling framework.

In most scenarios, ambitious mitigation targets cannot be reached without negative emissions (Rogelj *et al.*, 2018). Given the lack of known alternatives, land-based mitigation options are the preferred choice to remove carbon dioxide, emitted in particular by non-agricultural sectors: bioenergy with carbon capture and sequestration (BECCS), biochar, afforestation/reforestation and carbon storage in soils. The land footprint of such techniques can be large and contribute to a profound change in global food balances. According to the Intergovernmental Panel on Climate Change Special Report on global warming of 1.5°C (Rogelj *et al.*, 2018), trajectories to maintain the average temperature increase well below 2°C (1.9 W/m^2) would require between 100 Mha and 700 Mha of additional energy crop areas by 2050 and up to nearly 1,000 Mha of additional forest areas. These changes would be at the expense mainly of pastureland (up to -800 Mha) and cropland (up to -450 Mha), with consequent significant impacts on food production and on agricultural commodity prices, with increases from 50 percent to 100 percent in 2050 and 140 percent to 340 percent in 2100. To this day, the assessment of the effects on agricultural production and prices remains difficult. It depends on assumptions about the potential for productivity increases in the livestock and crop sectors, whose realism is difficult to assess. In any case, given the scale of land-use changes, such scenarios will imply major changes for food security and in production processes, with intensification trajectories that may be a risk or an opportunity for smallholder agriculture.

Changes in agricultural production systems in line with objectives for environmental protection would lead to sparing natural land for biodiversity (*cf.* Conclusion of Section 3), avoiding monocultures and diversifying land use, reducing pesticide use and avoiding nutrient leaching.

A move towards healthier diets could have substantial co-benefits on food supply. For example, the processes involved in the production of vegetable proteins are much less land-intensive than those of animal proteins and therefore put less pressure on food systems (Hallström, Carlsson-Kanyama and Börjesson, 2015). Concerns about pollution, health and nutritional quality could lead to a reduction in mineral fertiliser use, an increase in nutrient recycling, a decrease in pesticide use and more diversified plant production. Currently, organic agriculture is the main system with reduced pesticide use that is developed enough to be analysed quantitatively, though it requires more land (Muller *et al.*, 2017) and is more expensive than conventional systems (Seufert and Ramankutty, 2017). The major increase in demand for organic agricultural products in developed countries is an obvious reflection of these concerns, but food quality is also a growing concern in developing countries (Ndungu, 2013).

Caught between reduced land use for food production as more land will be needed for nature preservation or bioenergy production, and adverse impacts on yields for various reasons (climatic, economic and progressive withdrawal from conventional agriculture), long-term agricultural prices could return to an upward trend, creating major issues of access to food for various populations.

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