

Chapter 5

The Importance of International Trade and Trade Rules for Transforming Global Agriculture



Lead Article: **THE IMPORTANCE OF INTERNATIONAL TRADE, TRADE RULES AND MARKET STRUCTURES**

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Abstract

Reforms of the international trade regime require a significant reduction or removal of harmful subsidies currently provided mainly by developed countries, while at the same time allowing special treatment and safeguard mechanisms for developing countries in order to promote their smallholder farmers' livelihoods. Such reforms, coupled with policies in support of sustainable small-scale agriculture in developing countries, would improve local production for enhancing food security.

There is also a need for regulatory measures aimed at reorganizing the prevailing market structure of the agricultural value chain, which is dominated by a few multinational corporations and marginalizes smallholder farmers and sustainable production systems. Policies that increase the choices of smallholders to sell their products on local or global markets at a decent price would complement efforts to rectify the imbalances.

In addition, a shift to more sustainable and ecological agricultural practices would benefit smallholder farmers by increasing productivity while strengthening their resilience to shocks, such as climate change, and reducing the adverse impacts of conventional agricultural practices on the environment and health. The trade policy framework should therefore support such a shift.

A. Introduction

The intersection of international trade and agriculture has become increasingly important as more and more countries and their farmers participate in global markets. National trade-related policies, such as subsidies and support measures, trade restrictions and tariffs, have a major impact not only on national agricultural and food systems, but also on agricultural performance in other countries. Due to the increasing importance and binding nature of multilateral, regional and bilateral trade agreements, the rules established therein have significant effects on national trade policies as well as on the structure and nature of the global system of agricultural trade and production patterns. National trade policies and international trade rules can therefore have a significant impact on food security.

The trade framework that has influenced the policies and practices of many developing countries comprises the following: loan conditionalities of the international financial institutions, rules of the World Trade Organization (WTO), rules in bilateral and regional trade agreements as well as unilateral policy

measures (South Centre, 2011). Guided or obliged by the rules and conditionalities within this framework, many developing countries have significantly lowered their agricultural tariffs and their domestic support for farmers. At the same time, liberalization of markets has increased pressure on costs, prompting producers towards greater specialization, which often results in monocropping, increased mechanization and utilization of chemicals (leading to higher dependence on external inputs), and enhanced scales of production.

In contrast, developed countries have not been subject to the conditionalities of the international financial institutions. Moreover, WTO rules, by and large, have allowed them to maintain their traditional support for domestic agriculture through a combination of high subsidies, high tariff peaks and export promotion. And in the free trade agreements (FTAs) involving developed and developing countries, agricultural subsidies are generally omitted from the agenda. The trade framework governing global agriculture is thus an awkward combination of liberalization and protectionism. While developing countries are required to undertake greater liberalization, developed countries have been able to retain their protectionist policies.

Although increased agricultural trade can offer opportunities for the poor, the benefits have been unevenly distributed. Growing evidence indicates that, to date, small-scale farmers and rural communities in many countries have not benefited significantly from agricultural trade liberalization (IAASTD, 2009); instead it is the largest agricultural producers who have been able to benefit more easily from the opportunities resulting from improved market access. Thus, overall, the distributional effects of trade liberalization, among and within countries, have resulted in the poorest developing countries and farmers being net losers.

The most vulnerable groups who experience hunger are the smallholders, landless labourers, pastoralists, fisherfolk, forest dwellers and the urban poor. Any trade regime that fails to benefit these groups, or affects them negatively, is likely to lead to the denial or violation of the right to food (De Schutter, 2009a). Such a denial of an essential right underlines the importance of ensuring access of all people, especially the poor, to food, as well as the need for giving priority to food security in developing countries.

While many developing countries once sought food self-sufficiency, this objective was gradually tempered by a perception of economic efficiency that recognized the advantages of importing food at cheaper cost, so long as there was sufficient foreign exchange to pay for the imports. As a result, local food production was not given high priority in national policies. Cheaper food imports took an increasing share of the domestic market in many countries. However, while this gave consumers access to lower priced food, there were drawbacks, including a decline or stagnation in domestic food production and adverse effects on small farmers' livelihoods and rural development. In some cases, the foods imported from developed countries were heavily subsidized, while the poorer countries did not have the resources to match the subsidies.

This situation has been exacerbated by rising world prices of many food items in recent years, resulting in more expensive food imports and inflation of food prices in local markets, often leading to social instability. A further increase in world food prices in 2011 and 2012 has given rise to uncertainty and insecurity in the net food importing countries. As a result, some of these countries have shifted their focus back to achieving greater self-sufficiency and increasing local food production, and to adopting trade policies in support of this objective (IAASTD, 2009; Khor, 2009; South Centre, 2011).

It is now increasingly recognized that the immediate need is to ensure availability of food in countries currently dependent on imports. However, a long-term solution should include boosting local food production in developing countries where conditions are suitable. While there are many factors involved in increasing local production, an appropriate trade policy framework is a very important requirement. Trade policy reform aimed at creating a fairer global trading system could make a positive contribution to food security and poverty alleviation.

At the same time, there is a growing realization that agriculture cannot proceed on the energy- and input-intensive paths of the past, and that a paradigm shift towards sustainability is needed, where small-scale farmers and agroecological methods provide the way forward (e.g. De Schutter, 2010; Herren et al., 2011; IAASTD, 2009). Reducing dependence on fossil energy inputs and cutting down on greenhouse gas (GHG) emissions from agriculture will require increasing local food self-sufficiency and promoting less fuel- and petrochemical-intensive methods of production (see comment by Heinberg in this chapter).

To the extent that trade rules are fair and promote sustainable or ecological agriculture, they should be maintained and promoted. However, there are aspects of existing international and regional trade rules that run counter to the promotion of a trading system supportive of sustainable agriculture. In addition, the prevailing market structure, where the supply chain is dominated by a few multinational companies, has led to the marginalization of small farmers and the further entrenchment of unsustainable agricultural practices. This situation is exacerbated by pressure on countries to specialize in producing commodity cash crops and undertake large-scale farming.

This chapter thus addresses four key interrelated areas: structural adjustment and import liberalization, the imbalance in trade rules governing agriculture, the imbalance in market structure, and environmental sustainability. It raises issues that need to be addressed with a view to establishing a trade policy framework that is supportive of food security and sustainability.

B. Structural adjustment and import liberalization

An important factor in the decline of agriculture in many developing countries, especially in Africa, has

Table 1: Import surges of selected commodities, and their impact on local production volume, various years

Country/commodity	Extent of increase in imports	Percentage fall in local production	Time periods compared
Senegal: tomato paste	15 times	50 per cent	1990–1994; 1995–2000
Burkina Faso: tomato paste	4 times	50 per cent	1990–1994; 1995–2000
Jamaica: vegetable oils	2 times	68 per cent	1990–1994; 1995–2000
Chile: vegetable oils	3 times	50 per cent	1985–1989; 1995–2000
Haiti: rice	13 times	Small	1984–1989; 1995–2000
Haiti: chicken meat	30 times	Small	1985–1989; 1995–2000
Kenya: dairy products	52 times	Cut local milk sales	1980–1990; 1990–1998
Benin: chicken meat	17 times	Stunted	1985–1989; 1995–2000

Source: Based on FAO, 2003, and Action Aid, 2008.

been the structural adjustment policies prescribed by the international financial institutions. These policies affected rural producers directly, as they led to the dismantling of institutions and national policy measures that assisted farmers, including the reduction or removal of subsidies and credit, assistance in marketing and food processing, and a drastic reduction in agricultural tariffs (De Schutter, 2009a; Khor, 2009). The implementation of the WTO Agreement on Agriculture also led countries to liberalize their agricultural trade, thereby compounding the effect on agricultural producers in developing countries.

Studies by the Food and Agriculture Organization of the United Nations (FAO) have revealed that many developing countries significantly liberalized their agricultural imports by lowering tariffs as required by the conditionalities attached to loans extended by the international financial institutions. As observed by the FAO:

Structural adjustment programmes implemented over the past few decades have resulted in radical reform of the agricultural sectors of many developing countries, a period during which the majority of OECD agricultural sectors have continued to be heavily protected. The process adopted has, in many cases, severely damaged the capacity of developing countries to increase levels of agricultural production and/or productivity. These unilateral reforms tend to have been reinforced by multilateral agreements (FAO, 2003: 75, cited in South Centre, 2011).

At present, many of the poor countries that had originally lowered their applied tariffs under structural adjustment policies in the 1980s and 1990s are no longer so tightly bound by loan conditionalities.

However, several of these countries still maintain their low applied tariffs, which are far below their WTO bound rates (South Centre, 2011). For example, many African countries have applied agricultural tariffs of 10–20 per cent, compared with their bound rates of 80–100 per cent (WTO, 2010).

As a result, a number of countries that were net exporters or self-sufficient in many food crops have experienced a rise in imports – some of which are heavily subsidized – and a decline in local production. Table 1 highlights some cases of import surges, the extent of the surges and the impact on local production. The import surges (FAO, 2003 and 2006) have led to such low prices on domestic markets that they have tended to drive local producers out of business, threatening the ability of those producers to feed themselves and their families (De Schutter, 2009a and 2011c).

There have been many case studies of the incidence and damaging effects of import liberalization on local communities and rural producers in developing countries (see, for example, Action Aid, 2008; FAO, 2003; Raman, 2004). These studies show how farmers involved in the production of various food commodities (e.g. staple crops such as rice and wheat, as well as other produce such as milk and other dairy products, vegetables and fruit, poultry and sugar) experienced a fall in incomes and threats to their livelihoods as a result of an influx of imports which undermined otherwise viable, efficient domestic production (see box 1 for a case study of Ghana). As a result, the development of the agricultural sector in developing countries, and therefore agriculture's significant potential growth multiplier for the whole economy, was undermined. And the effects on human

welfare, national food production and food security were severe.

The situation has been exacerbated by high agricultural subsidies in developed countries, which enable them to penetrate developing countries' markets with cheap exports, thereby disrupting local production in the importing countries, preventing access by those countries to developed-country markets and outcompeting developing countries' products in third markets (South Centre, 2011). Several studies have shown that the high subsidies have allowed many agricultural products to be sold below the cost of production (see also the comment in this chapter by Lilliston and Hansen-Kuhn regarding the extent of United States "dumping"). For example, a calculation of the dumping margins for United States commodity crops

from 1990 through 2003 showed that wheat, corn, soybeans, rice and cotton were consistently exported at well below the cost of production, ranging from 10 per cent for corn to more than 50 per cent for cotton.

According to the United Nations Special Rapporteur on the right to food, the opening up of the agricultural sector to competition by binding countries to low import tariff rates may therefore constitute a serious threat to the right to food, especially in the least developed countries (LDCs) where agriculture remains a fragile sector (De Schutter, 2009a). This is because the greatest threat to food security is in the rural areas, and a larger proportion of the populations in the countries that are the most vulnerable depend on agriculture for their livelihoods.

Box 1: The impact of trade liberalization in Ghana

The policies of food self-sufficiency and government encouragement of the agricultural sector in Ghana (through marketing, credit and subsidies for inputs) helped to increase food production (for example of rice, tomatoes and poultry). However, these policies were reversed starting from the mid-1980s, and especially in the 1990s. For example, the price of fertilizer increased following an elimination of the subsidy, and the marketing role of the State was phased out. In addition, the minimum guaranteed prices of rice and wheat were abolished, as were many State agricultural trading enterprises and the seed agency responsible for producing and distributing seeds to farmers. Subsidized credit was also discontinued. Applied tariffs for most agricultural imports were reduced significantly to the present 20 per cent, even though the bound rate committed to the WTO by Ghana was around 99 per cent. As a result, local farmers were no longer able to compete with imports, the prices of which were kept artificially low by high subsidies in exporting countries, especially for rice, tomatoes and poultry.

Rice output in the 1970s could meet all the local needs, but by 2002 imports constituted 64 per cent of domestic supply. Rice output fell from an annual average of 56,000 tons (in 1978–1980) in the northern region to only 27,000 tons for the whole country in 1983. In 2003, the United States, which provided subsidies to its farmers for rice amounting to \$1.3 billion, exported 111,000 tons of rice to Ghana. A study by the United States Government found that 57 per cent of United States rice farms would not have covered their costs without subsidies. In 2000–2003 the average cost of production and milling of United States white rice was \$415 per ton, but it was exported for just \$274 per ton – a price 34 per cent below production cost.

Tomato production in Ghana, especially in the upper eastern region, had been thriving until a privatization programme resulted in the selling off or closure of tomato-canning factories, while import tariffs were reduced. This enabled the heavily subsidized EU tomato industry to penetrate Ghana, displacing the livelihoods of tomato farmers and industry employees. Tomato paste imported by Ghana rose from 3,200 tons in 1994 to 24,077 tons in 2002. Local tomato production has stagnated since 1995. Meanwhile, tomato-based products from Europe have made inroads into African markets. In 2004, EU aid for processed tomato products was €298 million, and there were many more millions in indirect aid.

Ghana's poultry sector began growing in the late 1950s, reached its prime in the late 1980s then declined steeply in the 1990s. The decline was due to the withdrawal of government support and the reduction of tariffs. Poultry imports rose by 144 per cent between 1993 and 2003, a significant share of which consisted of heavily subsidized poultry from Europe. In 2002, 15 European countries produced 9.010 million tons of poultry meat and 1.147 million tons were exported at a value of €928 million, or an average of €809 per ton. It is estimated that the total subsidy on exported poultry (e.g. export refunds, subsidies for cereals fed to the poultry) was €254 per ton. Between 1996 and 2002, EU frozen chicken exports to West Africa rose eightfold, mainly due to import liberalization. In Ghana, this adversely affected half a million chicken farmers. In 1992, domestic farmers supplied 95 per cent of Ghana's market, but this share fell to 11 per cent in 2001, as imported poultry became cheaper than local poultry.

Sources: Khor, 2008.

C. Imbalance in trade rules governing agriculture

The trade rules that underpin the global agricultural trade regime are also a source of concern. The WTO's Agreement on Agriculture contains rules in three areas – market access, domestic support and export subsidies – in which the developed countries were expected to reduce their protection. However, they have done very little in this regard.

There are many loopholes in the system, which allow the developed countries to continue to subsidize and protect their agriculture at the expense of the developing countries. The average support to agricultural producers in the major developed countries as a percentage of gross value of farm receipts was 30 per cent during the period 2003–2005, representing almost \$1 billion per day. These policies cost developing countries about \$17 billion per year, a cost equivalent to five times the recent levels of official development assistance (ODA) to agriculture (Anderson and Van der Mensbrugghe, 2006, cited in Hoffmann, 2011). It should be pointed out that these figures refer exclusively to agricultural subsidies, and do not include indirect subsidies for energy (fuel and electricity) used in agriculture.

The situation has improved only slightly in recent years: the Organisation for Economic Co-operation and Development (OECD, 2010) estimates that the subsidies given to farm producers in all OECD countries totalled \$252 billion in 2009, which is 22 per cent of the total value of gross farm receipts that year. This is about the same level as in 2007 and 2008. The level of support is even higher than this average in some countries: in 2006–2008, it was 27 per cent in the EU, 49 per cent in Japan, 60 per cent in Switzerland and 62 per cent in Norway (OECD, 2009). The level of support is also very high for certain products. Specific support for rice amounted to 60 per cent of total producer rice receipts in 2006–2008 (OECD, 2009).

There are at least three adverse effects of developed countries' subsidies on farmers in developing countries:

- (i) they are unable to export to the subsidizing developed countries' markets;
- (ii) they are unable to compete in third markets because the developed countries' products are sold at artificially low prices; and
- (iii) they have to compete in their own local markets with subsidized products coming from developed

countries, which adversely affects their market share, incomes and livelihoods (South Centre, 2011). The elimination or substantial reduction of both subsidies and protectionism in industrialized countries is therefore important, particularly for small-scale farming around the world (IAASTD, 2009).

Under the WTO, there has been some apparent progress in trying to address export subsidies. The WTO Hong Kong Ministerial Conference in 2005 agreed that as part of the Doha Round of trade negotiations, export subsidies of the developed countries would be eliminated by the end of 2013. However, this may not be realized if the Doha negotiations are not concluded, and there has not been a binding agreement on these elements as yet.

On the issue of domestic subsidies, a major loophole in the WTO Agreement on Agriculture is that countries are obliged to reduce their bound levels of domestic support that are deemed "trade distorting", but there are no constraints on the amount of subsidies deemed to be non-distorting or minimally distorting, which are placed in the so-called Green Box. Recent studies have shown that many of the Green Box subsidies are also trade distorting as they have significant effects on the market and on trade. Therefore, the major subsidizing countries can reduce their "trade-distorting subsidies" while changing the types of domestic subsidies they give, effectively providing similar levels or even increasing the total amount of subsidies (Khor, 2009). Unfortunately, the Doha negotiations are unlikely to impose new effective disciplines on the Green Box items, as the developed countries have successfully insisted that there be no new rules that would place a cap on the Green Box subsidies (South Centre, 2011). The current negotiating text proposes some changes to the Green Box, but these do not alter the basic elements, especially as there is no cap on the Green Box subsidies. Thus they could increase without limit in the future.

The Doha negotiations are mandated to substantially reduce (other) domestic support in developed countries. However, to date, the offers of the United States and the EU indicate their overall trade-distorting support (OTDS) would be reduced at the bound level, but not at the applied level (Khor, 2009). At present, the level of the actual OTDS of these two economies is far below the level of their total allowed trade-distorting support. Therefore, they can afford to reduce the level of allowed trade-distorting

support significantly before the cut reaches the level where the present actual trade-distorting support is affected (South Centre, 2011). In other words, they would only cut “water” (i.e. the difference between allowed and actual subsidies) and not their actual subsidies.

The figures in the agriculture negotiating group Chair’s text would not reduce the actual present domestic support for the United States. The allowable OTDS for this country is to be cut by 70 per cent (i.e. from the present \$48.3 billion allowable level to \$14.5 billion). The proposed \$14.5 billion level is in fact double the estimated 2007 actual OTDS of \$7–8 billion, thus effectively allowing the United States considerable “water” to increase from this level. Meanwhile, the allowable OTDS for the EU is to be cut by 80 per cent, which would reduce the EU’s present allowable OTDS of €110.3 billion to €22 billion. According to one estimate, however, the actual OTDS is expected to drop to €12 billion at the end of the Common Agricultural Policy reform in 2014. Thus the cut, though it appears to be large, would allow for “water” vis-à-vis what is planned.

While there has been a lowering of the applied OTDS of the United States and the EU in recent years, this has been accompanied by a rise in their support to Green Box items. As actual OTDS is cut, subsidies could be shifted to the Green Box and therefore total domestic support may not decline. Thus the cuts in their allowable OTDS may appear large, but in fact will not reduce applied or planned reductions in OTDS, and moreover, these will be offset by an increase (in the case of the EU) in Green Box subsidies (South Centre, 2011). An objective conclusion would be that the OTDS figures of 70 per cent cut for the United States and 80 per cent cut for the EU are not adequate as they do not constitute effective and substantive, or real, cuts.

Meanwhile, the developing countries are being asked to reduce their agricultural tariffs further. The Chair’s proposal at the Doha talks is for a maximum 36 per cent tariff cut by developing countries, while the LDCs are exempted from any tariff reduction, and small, vulnerable economies will be accorded more lenient treatment. However, the combination of high subsidies in developed countries and low applied tariffs in developing countries has caused highly frequent import surges, which have adversely affected farmers’ livelihoods and incomes.

Due to increasing concern over this, a majority of developing-country members of the WTO (which include the G-33, the African Group and the LDC group) have proposed two new instruments – Special Products (SP), and a Special Safeguard Mechanism (SSM) – to be introduced into the rules of the WTO as part of the Doha negotiations. The objective of both instruments is to promote the livelihoods of small farmers, food security and rural development in developing countries. Such policy flexibility is critically important to advance development and sustainability goals (IAASTD, 2009), and would shield developing countries’ producers from competition from industrialized countries’ farmers (De Schutter, 2009a).

Under the SP concept, developing countries would be entitled to have no or lesser reductions of tariffs on a certain percentage of their agricultural tariff lines as part of the Doha Round’s agriculture modalities. Under the SSM, developing countries would be allowed to impose an additional increase in tariffs, on top of bound rates, in situations of reduced import prices or increased import volumes, in order to protect local farmers from import surges and to avoid possible damage to domestic productive capacity.

Acceptance of these two instruments was formalized in the WTO’s Hong Kong Ministerial Declaration of 2005, which stated:

Members will have the flexibility to self-designate an appropriate number of tariff lines as Special Products guided by indicators based on the criteria of food security, livelihood security and rural development. Developing country Members will also have the right to have recourse to a Special Safeguard Mechanism based on import quantity and price triggers, with precise arrangements to be further defined.

The acceptance of these two concepts and instruments was a major step forward in recognition by the WTO of the right of developing-country governments to take trade measures in defence of their farmers’ livelihoods.

However, there is considerable opposition from some agricultural commodity-exporting countries, including several large developing-country agricultural exporters,¹ which fear that the use of the SSM could result in losses of legitimate exports. However, the restrictions they have proposed would prevent this instrument from working in an effective and simple way. As such, the SSM, even if established, may have very limited use in enabling developing countries to

protect their farmers from import surges. In any case, the Doha negotiations have hit an impasse, and it is unlikely that the SSM will be established any time soon.

Ironically, there is already an agricultural safeguard in the WTO (known as the special agricultural safeguard, SSG), but the eligibility criteria have disadvantaged most developing countries, resulting in only 20 developing countries being eligible to use the safeguard. Thus, most developing countries have no proper instrument to counter import surges. In order to rectify the imbalance and enable developing countries to safeguard their food security and farmers' livelihoods, more countries should be eligible to make use of the SSG.

In addition, regional and bilateral FTAs have prevented developing countries from using the flexibilities in the WTO agreements (De Schutter, 2009a). Moreover, many of these FTAs require developing countries to reduce or eliminate their tariffs even further (Khor, 2009; De Schutter, 2011b). For example, in the Economic Partnership Agreements between the African, Caribbean and Pacific (ACP) countries and the EU, the ACP countries are asked to eliminate their tariffs on 80 per cent of their tariff lines, including for agricultural products, over varying time periods. Yet the reduction of agricultural subsidies is not part of the FTA agenda. Thus developing countries are not able to gain from what may have been the most advantageous for them, while having to eliminate their agricultural tariffs to a larger extent than required of them by their obligations at the WTO (South Centre, 2011).

D. Imbalance in market structures

Increased trade in agricultural products implies that food production is redirected towards serving external instead of domestic markets. In addition, as larger farmers are more easily able to access foreign markets and benefit from such access, the increase in agricultural trade risks marginalizing small farmers. And since market power is rarely equally distributed along the value chain, this enables the more powerful actors to pass on costs and risks to the weaker actors – typically smallholder farmers (IFAD, 2010).

As such, the role of multinational corporations, particularly commodity traders, food processors and global retailers, becomes more important (De Schutter, 2009a; Herren, 2011). The world has witnessed a trend towards agribusiness consolidation, and this trend is

seen all along the value chain, with a few multinational companies providing the majority of inputs such as pesticides, seeds and crop genetic technologies, or undertaking marketing, food processing and retailing. This has resulted in national, regional and global supply chains that bypass traditional markets where smallholders sell to local markets and traders (World Bank, 2008).

The world seed, agrochemical and biotechnology markets are dominated by a few mega companies (see the comment of Elenita Daño in this chapter). In 2004, the market share of the four largest agrochemical and seed companies reached 60 per cent for agrochemicals and 33 per cent for seeds, up from 47 per cent and 23 per cent in 2007 respectively (World Bank, 2008). Where new technologies and products (e.g. transgenic seeds) have been developed and protected by intellectual property rights (IPRs), industry consolidation has taken place rapidly (PANNA, 2010). The four leading companies in terms of ownership of biotechnology patents had a market share of 38 per cent in 2004, and one company had a 91 per cent share of the worldwide transgenic soybean market (World Bank, 2008).

These companies have a vested interest in maintaining a monoculture-focused, carbon-intensive industrial approach to agriculture, which is dependent on external inputs (Hoffmann, 2011). International supply chains, often dominated by major food processors and retailers, also tend to source from large-scale monocrop production, rather than from diverse multicropping and integrated livestock and crop farming systems. This trend reinforces the marginalization of small farmers and of sustainable production systems. In addition, to comply with the standards of global retailers, many farmers are encouraged to use improved varieties of seeds and external inputs, often supplied by oligopolistic companies, which further exacerbates dependence and reliance on conventional agriculture (De Schutter, 2009a).

Given their increased market power, commodity buyers and larger retailers which dominate global food chains impose their prices on producers (who are in an unfavourable bargaining position) and set standards that many small-scale farmers are unable to meet (De Schutter, 2009a; PANNA, 2010). Small-scale farmers are therefore unable to compete and are relegated to low-value, local markets, which strongly disadvantage them in the competition

for land, water or other productive resources (De Schutter 2009b and 2011b). This risks perpetuating unsustainable agricultural practices, as small farmers are further marginalized. Furthermore, dependence on this increasingly concentrated global food supply chain intensifies vulnerability to shocks, whether from extreme weather events or excessive financial speculation in agricultural markets (see comment by Lilliston and Hansen-Kuhn in this chapter).

However, multinational corporations are neither subjected to much discipline, nor to obligations relating to their exercise of power on the market, which results in a critical governance gap (De Schutter, 2009a). Because of this and their market positions, most of the benefits from global food supply chains accrue to commodity buyers, food processors and retailers, rather than to developing-country producers (De Schutter, 2009b and 2011b).

Improving the rural poor's market participation is important, because if these markets work well and are inclusive of smallholder farmers, they can provide strong incentives for those farmers to make the necessary investments and take the requisite risks to enhance their ability to respond to market demand (IFAD, 2010), including investing in ecological agriculture for which there are valuable niche markets (e.g. for organic produce, as discussed in the next section). Moreover, if poor rural farmers were able to benefit from their participation in markets, they could gradually save and accumulate assets, increasing not only their own prosperity but also their capacity to deal with risks and shocks (IFAD, 2010). This would also enable them to deal better with some of the challenges associated with climate change, for example.

E. Environmental sustainability

Conventional and intensive agriculture is characterized by mechanization and the use of chemical fertilizers and pesticides, as well as a reliance on irrigation and fossil fuels. These have contributed to considerable environmental damage, including accelerated loss of biodiversity and ecosystem services such as those necessary for the production of food and water or for controlling disease, increased GHG emissions, as well as considerable health impacts (IAASTD, 2009; World Bank, 2008).

Moreover, climate change has the potential to

undermine the resource base on which agriculture depends. Agriculture has to cope with increased climate variability and more extreme weather events. While local mean temperature increases of 1°–3°C would affect crop productivity differently depending on latitudes, with tropical and arid regions suffering more, warming above 3°C would have increasingly negative impacts in all regions (Easterling et al., 2007). In some African countries, yields from rain-fed agriculture, important for the poorest farmers, could be reduced by up to 50 per cent by 2020 (IPCC, 2007b), which would increase the number of people at risk of hunger.

However, the impacts of agriculture on the environment and human health, and the relationship between agriculture and climate change, are usually ignored in international trade discussions, despite the repercussions these could have on the right to adequate food (De Schutter, 2009a).

A progressive switch to more input- and energy-intensive forms of agricultural production cannot be attributed directly to the increase in global trade in agricultural commodities, but this trend has been encouraged by the specialization of countries in cash crops for export (De Schutter, 2009a). Intensive, large-scale industrial export-oriented agriculture has increased under the trade liberalization agenda (see comment by Lilliston and Hansen-Kuhn in this chapter), with adverse consequences such as the loss of soil nutrients and water from agricultural lands, and unsustainable soil and water management (IAASTD, 2009).

In addition, the failure of markets to value and internalize environmental and social costs in the prices of traded agricultural products, or to provide incentives for sustainability, has also played a part in entrenching unsustainable practices in agriculture (IAASTD, 2009). Inappropriate pricing and subsidy policies and the failure to manage externalities also hinder the widespread adoption of more sustainable agricultural practices (World Bank, 2008). The situation is compounded by price volatility, where extremely low agricultural commodity prices over the past two decades followed by the recent price hikes has discouraged long-term investments in more sustainable, ecological agriculture (see comment by Lilliston and Hansen-Kuhn in this chapter).

Given the growing concerns about climate change and the imperative for alleviating rural poverty, there is an urgent need to move towards more sustainable,

environmentally friendly agricultural practices that are more resilient and less input- and energy-intensive (De Schutter, 2009a and 2010). This is especially pertinent in the current context of the scarcity and high prices of oil (see comment by Heinberg in this chapter). There is increasing evidence that sustainable or ecological agriculture can contribute to climate change adaptation and mitigation while also being productive (e.g. De Schutter, 2010; ITC and FiBL, 2007; Niggli et al., 2009; Scialabba and Müller-Lindenlauf, 2010; also comment by Heinberg).

According to the United Nations Special Rapporteur on the right to food, future regulation of international trade in agriculture should take into account the impact of various modes of agricultural production on climate change to allow countries to provide incentives in favour of forms of production, such as organic agriculture and agroecological practices, which respect the environment while at the same time contributing to food security. This supports the call by the International Assessment on Agricultural Knowledge, Science and Technology for Development (IAASTD) for a paradigm shift in agriculture towards agroecology.

A major task is to transform the uniform model of quick-fix industrial agriculture that is highly dependent on external inputs into flexible, "regenerative" agricultural systems that continuously recreate the resources they use and achieve higher productivity and profitability (of the systems, but not necessarily of individual products) with minimal external inputs, including energy (Hoffmann, 2011). A mosaic of regenerative systems may include biodynamic agriculture, organic agriculture, agroecology, integrated crop and livestock farming, and similar practices.

The trade policy framework should support such a transformation of agriculture, rather than encourage the prevailing unsustainable system. Moreover, if the impacts of structural adjustment and import liberalization and the imbalances in trade rules and market structure are not addressed, countries are unlikely to move towards more sustainable modes of production. It is unlikely, for example, that large farms that rely on significant subsidies to be profitable will make a significant shift to ecological agriculture practices, unless there is comprehensive reform of the system of subsidies, including lowering or removing some of the so-called "green" subsidies that fall in the Green Box (Hoffmann, 2011). At the same time, farmers should be given adequate support for ecological agriculture practices.

However, a supportive trade framework should avoid protectionism in the guise of environmental protection (South Centre, 2011). It should also support the "greening" of subsidies and in ways that will give greater policy space to developing countries. Environmental standards, labelling and other issues would also need to be dealt with from a "sustainable development" perspective. Developing countries should be provided with resources and technologies for upgrading their existing environmental technologies and standards. In addition, the full and effective participation of developing countries in setting international standards should be assured, as also the concomitant assistance, particularly to small-scale farmers, to comply with such standards.

Measures should also be taken to encourage organic farming, which is not only beneficial to the environment, but also provides trade opportunities for smallholder farmers in developing countries. Niche markets such as organic can provide price premiums and/or long-term contracts (IFAD, 2010). The total global organic market was worth \$55 billion in 2009, having grown by 5 per cent from the previous year, despite the economic and financial crisis (Willer and Kilcher, 2011). Global revenues have increased more than threefold from \$18 billion in 2000, and double-digit growth rates were observed each year, except in 2009. As there is a significant increase in consumer demand for organic foods worldwide, there is also an opportunity for small farmers to market their surplus organic products in national, regional and global markets. Thus a change in consumer tastes and demand towards organic foods, or more generally foods produced using ecological agriculture methods, can motivate changes in production systems. At the same time, it can increase the opportunities and markets for small farmers, thereby improving their livelihoods (South Centre, 2011).

Many governments in both developed and developing countries have announced plans to increase organic farming practices. However, while developed-country governments offer significant subsidies for organic farming, similar financing is scarce in developing countries. More proactive measures are required in developing countries to promote organic farming and to overcome obstacles to production, marketing and trade.

One issue that needs to be addressed is the difficulties faced by developing-country producers in adhering to organic standards. This is not so much an issue at the national level, but is a major problem for potential

exporters who need to comply with many technical regulations, standards and certification systems. As UNCTAD (2004) points out, it is important to find a balance between the need for harmonization for trade and fair competition, and the need to take into account local and regional conditions and requirements. To overcome the challenge of third-party certification faced by smallholder farmers in developing countries, which is expensive, various schemes have been developed, such as participatory guarantee systems and group certification. These alternatives, which are more accessible to smallholder farmers and provide the quality assurance that consumers need, should be further promoted (also see the comment of Twarog in this chapter).

A supportive trade framework can thus assist in the transition to ecological agriculture and organic farming. Farmers using sustainable approaches should be supported by proactive State intervention (South Centre, 2011), including public sector financial and technical support, as well as extension services to introduce best practices in ecological agriculture. Other State-led services could include ecological rehabilitation, provision of organic seeds, credit and marketing support. Concurrently, the domestic tariff policy should enable small farmers to withstand competition from imports.

F. A trade framework supportive of food security and sustainability

A trade framework that is supportive of food security and sustainability will need to focus on smallholder farmers in developing countries, and encourage domestic production. This could be achieved by helping small-scale producers improve their productivity, particularly through ecological means, and strengthening their access to local markets while shielding them from the negative impacts of unduly subsidized imports of food commodities (De Schutter, 2009a). Support to sustainable small-scale agriculture, especially in terms of ensuring access to land, water, genetic resources and credit, and by investing in and improving access to rural infrastructure is critical, as is the need to untangle local food economies from the grip of supply chains dominated by multinational corporations (see also comment by Lilliston and Hansen-Kuhn in this chapter).

In other words, the plight of small-scale farmers in developing countries should be addressed through

a combination of policies that support ecological agriculture (through investments in R&D, extension services and rural infrastructure, subsidies and marketing support) along with an appropriate trade policy that protects farmers from cheap imports. At the same time, reform of the international trade regime should include requiring developed countries to sufficiently reduce or remove harmful subsidies, while providing developing countries with special treatment and safeguard mechanisms to promote their small farmers' livelihoods (Khor, 2011).

At the international level, this should include the elimination of subsidies for agricultural exports (as agreed in the WTO's Hong Kong Ministerial Declaration, 2005) and further discipline on domestic support, and the reduction of trade distortions caused by the large domestic subsidies provided by developed countries (as stated in the WTO's Doha Ministerial Declaration).

At the national level, developing countries should calibrate their degree of trade liberalization so that it is in line with their objectives and national realities. Countries that do not have the potential or intention to produce certain foodstuffs may have low or no import tariffs to enable their populations to obtain imported food at the lowest cost. Those countries that intend to increase food production can take advantage of the flexibilities allowed in the WTO by setting their tariffs at the appropriate levels in order to nurture a viable domestic food sector, as long as the applied tariffs do not exceed the bound rates (South Centre, 2011). Furthermore, those developing countries with an export interest should be given the opportunity to expand their export earnings through improved market access.

However, the flexibilities available in WTO agreements may be affected if countries enter into FTAs in which they commit to eliminate their tariffs for a large percentage of their products. Furthermore, although LDCs are exempted from reducing their bound tariffs in the Doha negotiations, they are not provided with similar exemptions on the basis of their LDC status in FTA negotiations. Thus bilateral FTAs should allow sufficient policy space for developing countries to promote their agricultural development.

Besides the establishment of an appropriate tariff policy, governments can provide various forms of encouragement to boost agricultural activities, including subsidies, credit, establishing security of

land tenure and provision of inputs (South Centre, 2011). The WTO Agreement on Agriculture sets the rules on the extent of subsidies allowed. Since many developing countries previously provided only limited subsidies, if any (mainly because they lacked the financial resources), they are not allowed to provide the high levels of support given by developed countries. However, the Agreement on Agriculture allows developing-country governments to provide a certain level of *de minimis* support, equivalent to 10 per cent of total agricultural value, as well as to make use of the category of non-trade-distorting support known as the Green Box. The developing countries can avail themselves of these flexibilities to provide subsidies, as they deem appropriate, especially for ecological agriculture. However, many of them face budgetary constraints or simply lack the financial resources to do so.

The international trade regime needs to be reformed to bolster efforts to promote ecological agriculture systems, which would benefit smallholder farmers by increasing productivity, while also being more resilient to shocks such as climate change. Such systems would also reduce the impacts of agriculture on the environment and health, and are therefore urgently needed.

The options for action discussed below are based on the four themes of this lead article.

1. Review of structural adjustment recommendations and agricultural liberalization policies

In general, the need for special treatment for food products, allowing gradual and lenient liberalization, instead of steep tariff reductions, is important for developing countries. They should be allowed to provide adequate support to their agricultural sectors and to have realistic tariff policies to advance their agriculture, especially in view of the persistently high subsidies of developed countries (Khor, 2009). The developing countries should be allowed to calibrate their agricultural tariffs in such a way as to ensure that their local products can be competitive, farmers' livelihoods and incomes sustainable, and national food security assured.

(1) The policies of the international financial institutions and regional development banks should be reviewed and revised as soon as possible, so that they do not continue to serve as barriers to food security

and agricultural development in developing countries (Khor, 2009). An independent ongoing review of the trade aspects of the present and proposed conditionalities of loans is needed.

(2) Loan conditionalities should not oblige developing countries to undertake liberalization (in rate and scope) that is beyond their coping capacity, or which would be damaging to the livelihoods and incomes of their rural producers. The approach to liberalization in developing countries should be reoriented to be more realistic, especially since developed countries continue to maintain high subsidies (South Centre, 2011).

(3) At present, developing countries have flexibilities under WTO rules to adjust their applied tariffs upwards to their bound rates, and even beyond the bound rates in certain circumstances. Loan conditionalities should not prevent or hinder developing countries from making use of these flexibilities (South Centre, 2011).

(4) There is an urgent need to provide a special safeguard facility which could be used simply and effectively by developing countries so that the needed increase in tariffs can better protect their producers from the impacts of import surges (as discussed in the next section).

(5) Revenues from such tariffs could be used to finance rural development and infrastructure schemes aimed at benefiting farmers. Public investment in social protection for non-food-producing households living in poverty is also needed (De Schutter, 2011b). Complementary policies and programmes to facilitate transitions from conventional to sustainable agriculture, and to support the net trade losers through public investment to stimulate long-term growth in the agricultural sector are also important (World Bank, 2008).

2. Reforming trade rules governing agriculture

A major challenge at the international level is to modify a number of key market distortions that act as a disincentive to the transition to sustainable agricultural practices in developing countries (Hoffmann, 2011). Such distortions arise from the significant subsidization of agricultural production in developed countries and their export of this output to developing countries. As long as such subsidies are not significantly altered by the current WTO negotiations, it is difficult to imagine how developing-country producers could implement

a paradigm shift towards ecological agriculture on the massive scale necessary to have an impact. Apart from real reduction of domestic support in developed countries, reforms should include improved market access for developing-country produce and policy space to support the agricultural sector, allow expansion of local food production, and the use of effective instruments to promote food security, farmers' livelihoods and rural development. This necessitates a reconsideration of trade rules in the WTO and in various FTAs (South Centre, 2011) as follows:

(1) Export subsidies in developed countries should be eliminated by 2013, as agreed in the WTO's Hong Kong Ministerial Declaration.

(2) There should be an effective deep reduction of domestic support (in actual levels, and not just the bound levels) in developed countries, with as few loopholes as possible and with no or minimal "box shifting" (i.e. shifting of subsidies towards those deemed to be non-distorting or minimally distorting, which are not subject to any disciplines, but which could also have significant effects on the market and on trade). This should include reductions in the actual OTDS as well as an objective review of the nature and effects of various subsidies now classified as Green Box subsidies, leading to stricter disciplines and reductions.

(3) Developing countries should be allowed adequate policy space to enable them to use domestic subsidies for supporting farmers' livelihoods and food security. These could include the provision of low-cost credit, assistance for the supply of inputs, storage facilities, road and transport infrastructure, strengthening of extension services, marketing facilities and networks, and support for value-added processing of agricultural products. Developing countries could examine the avenues available to them for making use of domestic subsidies, for example through the *de minimis* subsidies, and if this is not sufficient, to explore the possibility of using more subsidies, including those in the Green Box.

(4) Developing countries should have adequate policy space to make use of tariffs to protect the interests of their domestic farmers and promote food security and rural development. They should be able to use the flexibilities in the WTO rules to adjust their applied tariffs to the appropriate level as long as these do not exceed the bound level.

(5) The WTO rules should enable developing countries to promote food security, farmers' livelihoods and rural development through the effective use of the SP and SSM instruments. So far, only developed countries and a few developing countries are able to make use of a special agricultural safeguard (SSG); all developing countries should be allowed to make use of this facility to prevent import surges until a permanent SSM for developing countries is established.

(6) The developing countries' goals of food security and protection of farmers' livelihoods should be given priority by negotiators of FTAs. The percentage of goods identified for tariff elimination by developing countries should be adjusted, if necessary, to accommodate the need to exclude sensitive agricultural products. In the light of the food crisis, developing countries that have signed or are negotiating FTAs should ensure that such agreements will provide enough policy space to allow them to impose sufficiently high tariffs on agricultural imports so that they can rebuild and strengthen their agriculture sectors in order to achieve food security and promote farmers' livelihoods and rural development.

3. Addressing imbalances in market structure

Steps should be taken for the establishment of national and international rules for regulating the activities of commodity buyers, processors and retailers in the global food supply chain. Specific policies to support smallholder farmers, particularly women farmers, in gaining access to markets would also be important.

(1) The application of competition law to prevent the creation, maintenance and abuse of buyer power/ domination positions in supply chains is necessary. Competition regimes sensitive to excessive buyer power in the agrifood sector, and competition mechanisms that allow affected suppliers to lodge complaints without fear of reprisal by dominant buyers are needed (De Schutter, 2009b).

(2) There is a need for antitrust measures to break up monopolies and global price-fixing cartels, an international review mechanism to investigate and monitor concentration in the agrifood sector, and investigations into the behaviour of international corporations engaged in agricultural trading and food retailing, and their impacts on farmers, farm workers, consumers and vulnerable populations (PANNA, 2010).

(3) States should proactively adopt public policies aimed at expanding the choices of smallholders

to sell their products on local or global markets at a decent price by strengthening local and national markets and supporting continued diversification of channels of trading and distribution; supporting the establishment of farmers' cooperatives and other producer organizations; establishing or defending flexible and efficient producer marketing boards under government authority but with the strong participation of producers in their governance; using the public procurement system to support small farmers; and promoting and scaling up fair trade systems, including by ensuring access to productive resources, infrastructure and technical assistance (De Schutter, 2009b; IFAD, 2010; PANNA 2010).

(4) Understanding gender-related opportunities and risks in agricultural value chains and markets, and promoting gender equality in accessing emerging opportunities, are important to support the emergence of pro-poor agricultural markets (IFAD, 2010).

(5) Agricultural research and aid have often served powerful commercial interests, including multinational seed and food retailing companies, at the expense of the values, needs, knowledge and concerns of the very people who provide the food. Farmers and other citizens need to play a central role in defining strategic priorities for agricultural research and food policies (Hoffmann, 2011; see also Herren in chapter three of this Review).

4. An agenda for environmental sustainability

The regulation of international trade in agricultural commodities should take into account the impact of various modes of agricultural production on the environment and climate change in order to allow countries to provide incentives in favour of sustainable production, such as organic farming or agroecological practices, both of which respect the environment and contribute to food security (De Schutter, 2009a).

(1) Perverse incentives and subsidies that promote or encourage the use of chemical pesticides and fertilizers, water and fuel, or encourage land degradation, should be avoided (IAASTD, 2009; World Bank, 2008). At the same time, regulations and their implementation are needed to protect the environment and address pollution, as input-intensive agriculture has adverse impacts on the environment and human health (IFAD, 2010).

(2) Agricultural subsidies need to be redirected to encourage diversified crop production for long-term

soil health and improved environmental impacts. A major shift in subsidies is needed so that governments can help reduce the initial costs and risks to farmers of transitioning towards more sustainable farming practices (Herren et al., 2011). Subsidies should be confined to those essential for facilitating the transition to sustainable production methods, such as support for extension services and research and development, rewarding environmental services, ensuring protection against volatile prices and providing specific support to smallholders (Hoffmann, 2011).

(3) Farmers should be given access to support for ecological agriculture practices. Developing countries could consider devoting a larger share of their agricultural budgets to promoting ecological agriculture, which can boost both small farmers' livelihoods and food production, while protecting the environment and conserving resources such as soil fertility and water. The support should include extension services to train farmers in the best options available for sustainable development techniques, and the development of ecological infrastructure, including improved water supply and soil fertility. Farmers should also have access to credit and marketing support.

(4) Both developing and developed countries should be encouraged to take measures to facilitate trade in organic foods originating from developing countries. Developing countries could consider the following measures: (i) increase awareness of the benefits of organic food production and trading opportunities; (ii) promote research and development and training; (iii) identify marketing strategies and partnerships, with government support; (iv) provide financial support to organic producers; and (v) promote farmers' associations and non-governmental organizations (NGOs) (UNCTAD, 2004).

(5) Importing countries could also implement measures to promote imports of organic foods from developing countries by providing information on organic standards, and on regulations and market opportunities for developing countries' exporters. They should also facilitate access to their organic food markets by simplifying requirements and procedures for importing products from developing countries and applying the concept of equivalence between national organic standards (UNCTAD, 2004).

(6) Bilateral and multilateral donor agencies could provide appropriate technical assistance for the

export of organic products from developing countries.

(7) More generally, developing countries could consider the following strategies to promote organic agriculture: (i) organic policy and action plans should be linked to the overarching objectives of the country's agriculture policies to make them mutually supportive, and to remove obstacles and biases against organic agriculture; (ii) the government should give recognition and encouragement to the organic sector, closely cooperate with the sector's organizations and farmers, and play an enabling and facilitating role; (iii) establish a participatory process, with action plans and projects based on overall policies and objectives (UNCTAD and UNEP, 2008a).

(8) Barriers to the participation of small farmers from developing countries in organic markets should be removed. Efforts to address issues such as difficulties of market access, lack of market infrastructure, prohibitive third-party certification, the lack of research, technical, policy and financial support are needed (UNCTAD and UNEP, 2008a). Growing domestic markets are also important, and urban markets could start to provide significant opportunities for smallholder farmers (IFAD, 2010).

(9) Efforts should be made to enable smallholder farmers, particularly women farmers, to access productive resources and participate in agricultural decision-making, so as to facilitate their investment in and adoption of ecological agriculture approaches.

Commentary I: Ensuring Food Security and Environmental Resilience – The Need for Supportive Agricultural Trade Rules

Nikolai Fuchs, Nexus Foundation, and Ulrich Hoffmann, UNCTAD secretariat²

Abstract

Despite some recent improvement the pressing – and to date unresolved – crisis of hunger and mal-nutrition as well as the looming dangers from the environmental crisis of agriculture call for a more fundamental change than is currently under way. Both crises are also closely linked to trade rules. Agriculture has always been a stumbling bloc in GATT and WTO rounds of trade liberalization, yet agriculture's specificity has never been sufficiently reflected. Rather, agriculture has increasingly been treated like any other industrial sector that should strive to enhance (mostly labour) productivity, based on specialization, economies of scale and industrialization of production methods. But this runs counter to the need for strengthening rural livelihoods, food security and such agricultural practices, which respect the planetary boundaries through enhancing the reproductive capacities, the latter being the essence of real sustainability. Based on a better understanding of the specificity of agriculture, more regionalized/localized food production networks should be encouraged by trade rules, without excluding the supplementary role trade will have to play. The key question is whether such transformation can be achieved through fully exploiting existing flexibilities in WTO rules, or whether this will require a more fundamental change in the trade tool-box.

A. Introduction

After twelve years in the third millennium it has become evident that several of the Millennium Development Goals (MDGs), chiefly among them the abatement of hunger, will be very difficult, if not impossible to achieve. Besides, humanity today is consuming an amount of resources equivalent to those of 1.5 earths³, with a pronounced worsening tendency. Climate change has become a reality, and it is highly unlikely that the 2-degrees warming limit, which global governance seeks to meet, can be kept.⁴ The planetary boundaries for nitrogen and bio-diversity have already been crossed mostly due to industrialized agriculture. Be it economic crises, be it systemic weaknesses, be it missing political will – the reasons for not yet being able to reverse this trend up to date might be multiple. But if we take ourselves and our own intents, like the pledges for fulfillment of human rights and the implementation of recent government summit declarations seriously, new efforts and new approaches to address the global challenges seem to be necessary.⁵ This commentary, thinking out-of-the-box, attempts to analyze what type of trade rules is required to encourage and support a desirable, much-needed transforma-

tion of the food and agricultural sector, as outlined in chapters one to four of this Review.

B. What is at stake?

In today's world, 870 million people⁶ still suffer from hunger and more than a billion from mal-nutrition. Despite recent resurgence of public and private sector attention in agriculture the hunger problem persists. Moreover, the worsening environmental crisis of agriculture is unlikely to be checked, even if today's concept of green economy (mostly based on the paradigm of "producing more with less"⁷) is being turned into practice.⁸ There are many reasons for hunger, mal-nutrition and environmental degradation, but international trade, its rules and resulting incentives play an important role in the whole setting. It is questionable whether with the currently existing WTO tool-box the drastic problems analyzed in this Review can effectively be tackled. Despite some calls for completely excluding agriculture from the WTO, we search for a better pathway in a multilateral, but as well bilateral and regional trade framework.⁹ But this then needs major adjustments in respect to agriculture.

C. The broader context

Driven by climate change and the associated melting of the glaciers in the water castles of the world, more extreme weather patterns will occur, with damaging effects to the already most vulnerable regions in the developing world, in particular sub-Saharan Africa and South Asia. The still rising world population (with highest rates in Africa and South Asia, where hunger and poverty problems are already the most acute), over-consumption, high food waste and changing consumption patterns to more meat-based diets with the associated spiraling expansion of concentrate feed production, as well as growing amounts of bio-fuel production add pressure on the already limited land resources. Volatile financial markets, scarcity of raw materials and the closer link between food and energy prices increase food price volatility through the financialization of commodity markets. Besides the loss of land for the already vulnerable through land-use changes and "landgrabs", land degradation and water shortages compound resource scarcities. Loss of biodiversity might further reduce the resilience of the agricultural systems. Against this very background, food security might turn from already being the "hidden driver of world politics" (Lester Brown, 2011) to the most pressing international development and security issue of the 21st century.

D. The hunger challenge

If present trends continue unabated, food riots and mass migration are likely to become more pronounced in the future. In 2008, some governments were already shaken - rising food prices were among the causes for the "Arab spring". This food crisis was an important catalyst for realizing the need for fundamental transformation and questioning some of the assumptions that had driven food and agricultural policy in recent decades. The crisis led to a reversal of the long-term neglect of agriculture as a vital economic sector. Also, the declining trend of public funding for agriculture was arrested and some new funding secured, as pledged at the L'Aquila G 8 summit in July 2009, which however is still much behind commitments and real requirements. Some of the additional funding has been going to important areas, such as smallholder support, role of women in agriculture, the environmental crisis of agriculture, including climate change, and addressing weaknesses of international markets through aid for trade targeting trade infrastructure, information, finance and facilitation. Yet,

these measures fill gaps, but are insufficient to lead to the much-needed turn-around.

Although, there is a better understanding of the circumstances and a growing political will for change, there is no consensus on how to bring about the U-turn and what direction needs to be taken in this regard. As things stand at the moment, priority remains focused on increasing production, which is still very much biased towards expansion of "somewhat-less-polluting", external-input-dependent industrial agriculture (a sort of 'ecology light' approach), with governments, large agro-food and agro-chemical enterprises tempted to follow this line in search for 'jobs and growth'. Rather the aim should be towards sustainable, site-specific and affordable (not external-input-intensive) production methods that provide multi-functional benefits and employment creation as part of a coherent and more holistic approach reflecting the specificity of agriculture.

E. Rural economies

About 70 per cent of the hungry live in rural areas (they are family farmers or agricultural laborers). Neo-liberal policies (i.e. the Washington Consensus), still prevailing massive subsidies for agriculture in developed countries and focus of the political elite on urban areas in the South have led to a discriminatory treatment of rural regions in developing countries. However, according to FAO, smallholder farmers provide up to 80 per cent of the food supply in Asia and sub-Saharan Africa (FAO, 2012). That is why small-scale agriculture needs special attention. Interestingly, small-scale agriculture is often more productive than large-scale industrial farming (see Carletto et al., 2011). For assuring food security, boosting total factor, rather than only labour productivity is a very necessary requirement.

There are different ways of intensification to boost productivity. Industrialization of agriculture, the development, for which the "green revolution" is the best known symbol, and the liberalization and globalization of markets have undoubtedly contributed to food security of a growing world population. Today five billion people have enough to eat, which is a great success. But, at the same time, the share of the hungry and malnourished in total world population has not significantly declined and their absolute numbers have even increased. The industrialization of agriculture and concomitant market liberalization have thus not succeeded in overcoming the hunger problem. That is

mainly because hunger is not primarily a supply-related, but a poverty-linked issue of appropriate access to food (both items are therefore combined in MDG goal one). In this regard, the current system reaches its limits.

An alternative production-intensification strategy is the eco-functional-intensification approach (Bommarco et al. 2012) in agro-ecological systems (agro-ecological systems are more open, even to inputs than pure organic farming systems, thus having a higher yield potential)¹⁰ (see Altieri et al., 2011 and Branca et al., 2013). The aim is to boost yields of the total production system (rather than only specific crops) relying on strengthening site-specific ecological production methods that harness the multi-functionality of agriculture and strengthen its resilience. These agro-ecological approaches, through the use of local resources, skills and inputs, fit well into strategies for strengthening rural economies and livelihoods. Although such forms of agriculture are knowledge-intensive, virtually all of these skills and technologies are readily available (a major difference to most other sectors, where many new technologies for enhancing energy/material/resource efficiency still have to be developed). What is rather lacking is adequate public support to efficient extension services for knowledge dissemination, public investment in adequate physical infra-structure, land reform for secure tenure rights (including for women) and access to financing. The agricultural industry is already, and in the future will even more support such approaches for specific products and processing methods.¹¹ Governments should follow this trend.

Increasing productivity must, on the one hand, be integrated into a broader social and environmental framework of providing sufficient rural livelihoods - with rural economies moving into the focus - and, on the other hand, guarantee the regenerative capacity and enhanced resilience of the natural resources and production factors, culminating in permanently high soil fertility.¹²

Even if it was in the market-logic of the past to concentrate on regions and areas where sufficient purchasing power prevailed, revitalizing rural economies and lifting people out of poverty creates new markets for the future. Besides, at times of ever higher public indebtedness, which makes social safety nets flimsy and thin, vitalized rural regions become essential for the viability of communities. From a political perspective, revitalized rural economies reduce the pressure

on migration to urban areas and beyond borders, thus preventing national and international political tensions.

F. The high environmental costs of the current mode of agricultural industrialization

Besides the unresolved hunger problem, agricultural industrialization has come at high environmental costs. Today's conventional agriculture, being a very external-input-dependent production system with a negative, if not rarely 'catastrophic' energy balance (see the commentary of Rundgren in chapter 1), despite some improvements disproportionately contributes to climate change, pollution of water, land degradation and biodiversity loss. The already crossed planetary carrying capacity for nitrogen does not allow any uncritical future input intensification in agriculture. Agriculture and related land-use changes cause at least one third of global GHG emissions (if indirect emissions in plant and equipment, transport, as well as along the food processing and marketing chain are taken into account, agriculture's contribution to climate change is well over 40 per cent, see the commentary of GRAIN in chapter one). GHG emissions of agriculture are set to increase by 40-60 per cent till 2030, whereas a decline of the same order of magnitude would be required in order not to exceed the two degree global warming goal. Besides, a higher trade intensity may further contribute to climate change (see Schmitz et al., 2012) and raise health related costs.¹²

G. The countervailing effect of trade is limited

The damage to agriculture is not only costly, it is also a serious environmental, health and life threat for the future development of all of us. Climate change and the environmental crisis of agriculture, which is caused by the "mining" of the most critical resources for regenerative agriculture, like soil organic content, will drastically constrain supply, mainly in already vulnerable regions. In theory, trade can bridge some of the regionally arising supply gaps, but the higher the frequency and severity of droughts and floods, the more insecure the availability¹⁴ and affordability¹⁵ of imported food.

H. Questions

This takes us to a number of questions resulting from

the above-made analysis:

- How big is the chance of addressing these problems with today's trade tool boxes?
- Will it be possible and sufficient to tackle the huge challenges by fully exploiting the existing flexibility options and mechanisms in the current trade rules?
- Or is a more fundamental change needed in order to solve the 21st century issues of hunger, rural poverty, lingering mass migration and required strengthening of agricultural resilience?

We want to explore these questions by starting from the fundamental observation that agriculture is special.

I. Agriculture is special

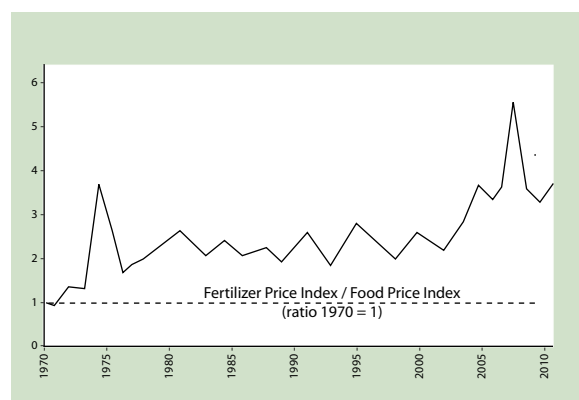
Agriculture has been and still is in nearly any bilateral or regional negotiations a major obstacle to free trade agreements. Agriculture seems to be special; and indeed there are good reasons for agriculture's special role. Agriculture, being a management system for half of the terrestrial biomass producing areas, and being therefore critical in many environmental respects, is bound to the land, which means it cannot be moved to more favourable conditions. It has long investment intervals (whether to have milk cows or not is – including breeding – for example a very long-lasting decision, which is as well influenced by policies e.g. milk quotas). Agriculture is the item for food security, it is a strong component for rural development, it is closely linked to landscape and its care, to local climate, ecology and biodiversity, it is mainly organized in family and generational structures and it is strongly based on local or site-specific traditions and identification patterns (a farmer is not only a producer of goods, but also a manager of an agro-ecological system and a social fabric) (see Brodheur et al., 2010). This is true not only in Europe, but principally as well in key agricultural exporting countries like Australia and Brazil, or in the African countryside. Besides, agriculture employs billions of people in the developing world.¹⁶

Agriculture's role for development has for long been undervalued, and has only very recently been reinvigorated. It has the potential to lift people out of poverty (see World Bank, 2008), provide many ecological and amenity services and could be turned from a key source of global warming into a sector that can significantly mitigate it and adapt food production to the perils of climate change at very low costs relative to other sectors. To exploit this potential, agriculture

needs a shift to strengthen its regenerative potential. Trade rules need to support, not compromise this move.

Unfortunately, the externalities produced by industrial agriculture are not, and will not, at least in the foreseeable future¹⁷, be integrated in product prices. In fact, enhanced external input use¹⁸ and specialization have made it harder to internalize externalities, because agricultural input-price dynamics has outpaced the evolution of food prices (see figure 1) (the higher the input prices, the more unlikely that they are taxed, for example). Conversely, really sustainable forms of production, such as agro-ecological approaches, systemically embody large parts of external costs, because their preventive approach avoids or minimizes most externalities. Such production methods generate many public benefits and goods, such as strengthening biodiversity, avoiding ground water and river pollution or reducing GHG emissions, to name but a few. Yet, neither the avoided public costs nor the public benefits are recognized by the market, which encourages increased labour, but not total factor/system productivity. As if that were not enough, organic producers especially have to provide documentary evidence (in the form of inspection, auditing and certification) that their products are indeed meeting stringent standards. Market logic is thus put on its head; instead of rewarding the most efficient, clean and sustainable production system, prevailing market rules award the 'polluting' free riders.¹⁹

Figure 1: Development of food and fertilizer prices, 1970 to 2010



Sources: Limes (2012: 10), referring to Kotschi (forthcoming).

Faced with this dilemma and as a result of enhanced liberalization, the increased competitive pressure in the prevailing distorted market conditions hits hard particularly the farms that produce the most common goods and services (whether in developed or developing countries). Given this dilemma, a new approach to address this issue is overdue.

Although GATT and WTO have treated agriculture in a specific agreement (here, because of the political sensitivity of food security and agriculture's close association with natural resources and the health and safety of people), even lately the sector profited only from some «end-of-pipe» flexibilities and special safe-guards, while subjecting agriculture to the across-the-board «industry» logic of liberalization (see below).

Green Box measures, besides being misused for at least indirectly supporting conventional forms of agricultural production (recently, of all domestic agricultural support, green-box subsidies accounted for between 75 and 85 per cent in the EU and the US, respectively, Lunenborg, 2013), have so far been only marginally effective in reducing problematic impacts.

As outlined above, this generic industry-biased approach to agriculture contributed to the prevailing problems of rural poverty, food insecurity, malnutrition and environmental degradation in agriculture we currently observe. Yet, to boost total factor and system productivity, resource, material and energy efficiency will require fundamental changes in how we grow and consume food - nothing less than a new vision is necessary of how we farm, take better care of the planet's biological resources and live equitably within our planetary means.²⁰ The key question is whether such far-reaching changes can be achieved through fully exploring existing flexibilities in the current trade tool-box, or if it will necessitate a different development and trade focus as part of a fundamental transformation of global agriculture.

Some fundamentals have to be taken into account when trying to answer this question.

J. Agriculture's diversity is key

Nature depends on interaction (plants with insects, soil fertility with soil microbes, etc.) and therefore on diversity. Diversity plays a pivotal role in agriculture (FAO, 2004). Specialization in agriculture is an issue, but at the same time it must be integrated in a strategy of diversification.²¹ Tscharnke et al. (2012) point out, that integration strategies, combining crop and wildlife, are more suitable for food security than segregation, i.e. separating crop production from wildlife areas, which is mainly advocated by today's agricultural industry. This observation speaks for agro-ecological approaches, which follow an integrated diversity strategy, keeping also an eye on flourishing wildlife. On the latter, a recent EU estimate concludes that the Natura 2000 network in the EU alone produces eco-system services worth some 300 billion Euros.²²

Snapp et al. (2010) in a large long-term and partly participative study in Malawi have found that crop diversification could secure yields with a stabilizing effect at half of the fertilizer rate.²³ Besides, diversity is a core item for resilience against natural shocks, but as well against market disruptions, ever more important in today's fragile world. Moreover, diverse nutrient availability is an essential objective of sustainable food security.

Soil fertility - the heart of truly sustainable (regenerative) and resource-efficient agriculture for food security - can best be assured by poly-culture, adequate nutrient recycling, the integration of crop and livestock production and the effective use of functional biodiversity. Future trade rules should mirror and support this interplay.

In the end, any agricultural management approach

Box 2: The treadmill of external-input intensive production: experience of a soy farmer in Argentina

Fabricio Castillos is a soy farmer in the small town of Laboulaye in Argentina. According to Mr. Castillos, he can no longer make a profit on his 130 ha farm, specialized in soy production for export (destined either for bio-diesel or concentrate animal feed). Somebody with a current farm size of 500 ha is still profitable, but if input price trends continue one might need 5,000 ha in the future to make a profit. According to Mr. Castillos, this will speed up the concentration of land ownership so that the land will increasingly be owned by a few institutional investors.

Source: Huismann (2012: 193).

would have to meet the four principles of sustainable agriculture as mapped out in the Report of the Royal Society (2009): to be long-lasting, resilient, autarkic and prosper, by not over-extracting resources.

K. The current approach of the WTO

In the Doha Round negotiations, the modalities of 2008 on agriculture in respect to food security are mainly met by proposals for special safeguard mechanisms (SSM)²⁵, special products (SP) and few other special and differentiated treatment (SDT) provisions. Single (staple) crops (“special products”) for specific countries could therefore, at least for certain periods, be excluded from the liberalization process. The negotiations on these issues have become very complex; perhaps too complex to conclude the round. Besides, SDT as of today in the WTO rulebook with its focus on single crops does not systemically take into account the diversity imperative of agriculture. A more locally and regionally-oriented trade approach could help to strengthen rural economies with diverse production patterns, which will be supplemented by trade for selling surplus produce and enriching local supply. We argue that SDT, SSM and the special and sensitive product provisions of today as being concentrated on countries (not local regions) and single crops or products, moreover in a limited timeframe, will not be sufficient to meet long-term food security, environmental and livelihood needs, as they are not targeted, in the end, to strengthen rural economies (see as well Häberli, 2010: 304).

Trade, instead of being just a method of matching supply and demand – in its recent terms, pushing for open markets and liberalization – requires in the logic of seeking absolute or comparative advantage ever higher levels of specialization, industrialization and scale of production. The recently often highlighted global value chain concept pronounces this concept even further. It is not by chance that agriculture has been the biggest stumbling bloc in nearly all trade negotiations. It is not only tradition-based reluctance for change in the agricultural sector that creates difficulties for further trade liberalization, it is its diversity, livelihood and inherent non-industry and assurance of self-sufficiency logic, that causes this resistance.

While the preamble of the Agreement on Agriculture (AoA) recognizes food security as a legitimate concern, the actual provisions of the agreement treat food security as a deviation from the primary objective of agricultural trade liberalization (De Schutter, 2011c:7).

L. The required paradigm shift – beyond the dichotomy of liberalization and protection

We need to resist the temptation of resorting to shortcuts that cure symptoms, rather than dealing with root causes.

Recent reports like the Ecofair Trade Dialogue (2009), IAASTD (2009), SCAR (2011), FAO/GEA (2012), point at the importance of a renewed (rather than only reformed) trade architecture to play its proper role in

Box 3: Soil fertility and the importance of humus

Be it climate change with more extreme weather patterns, over-usage (degradation) of land, loss of biodiversity or over-simplification through specialization, agriculture needs a thorough regenerative potential, not least for efficiency reasons, as repair is always more costly.²⁴ To guarantee and strengthen the regenerative potential should be at the center of all future measures. One key element for the regenerative potential in many respects is humus. High humus content copes with many of the endangering issues, and strengthens the resilience capacity of almost all crops. Increasing the humus content leads to a “living” soil. Composting – and this is why we highlight it here explicitly as an example – and its use for enhancing the humus content of soils is also a very effective and cost-efficient method of carbon sequestration. According to IPCC (2007c: section 8.4.3), soil organic matter sequestration accounts for almost 90 per cent of the technical carbon sequestration potential of agriculture and is thus the pivotal climate mitigation measure (in contrast, more efficient application of fertilizers represents not more than some 2 per cent of the carbon sequestration potential). In this respect, agro-ecological production methods with - inter alia - various compost techniques have proven to serve the regenerative agricultural potential while mitigating potentially very significant amounts of CO₂ (see the commentary of Leu in chapter 1 and Gattinger et al., 2012, for a more elaborate analysis). Agro-ecological approaches are also more diverse approaches. Trade rules should facilitate and support such production methods and also respect local and regional diversity and preference requirements.

improving food security, farmers welfare and environmental issues.²⁶ This need for a new approach to the trade architecture, we mean, should go beyond the traditional dichotomy of liberalization and protection.

a) The problems with the current international rules relating to agricultural trade

The problems with the current international trade rules relating to agriculture are three-fold: (i) they still allow unfair conditions (high subsidies, partly shifted to the green box in the North); (ii) a too early push for open markets in the South (although the North kept its borders closed till the sector was sufficiently competitive); and (iii) following the absolute and comparative advantage approach for industrial sectors, foster specialization, economies of scale and closely-related industrialization of agriculture, with all its negative impacts.

Whereas WTO disciplines for the first two issues (unfair conditions) are currently just too weak and can be 'flexibilized' or bypassed by regional free trade agreements and bilaterals, the third issue – the inherent trend to specialization and industrialization – is more fundamental. The incentives on specialization, industrialization and economies of scale run the risk of jeopardizing long-term overall agricultural productivity growth and the resilience of agricultural production.

b) A basic pre-condition: Balance between the paradigms of food sovereignty and liberalization

It becomes more and more visible that *prosperity* (conventionally measured in GDP) is not the same as *welfare*, or well being. Welfare, especially in relation to food, also relates to health, trust and identification. People look for such items more strongly today. There is greater consumer attention to credence values like animal welfare, local origin of products and how food safety is assured.²⁷ People live up to values like self-determination and sovereignty, as well in raising their voice politically, but especially in respect to food.

Therefore "Food Sovereignty" came up as a term to express this attitude.

By having full respect for this attitude, food sovereignty, unless integrated in an overall framework, might lead to too fragmented organizational patterns in terms of differing regulations, making (trade-) exchange between regions, which will still be necessary and beneficial, too complicated and at last costly. Therefore a balanced approach between liberalization and food sovereignty is required.

Liberalization or food sovereignty against this background is not an either-or question, but one of better synergizing the benefits of both approaches. We see this synergy in a greater emphasis on regionalized/localized (see box 4 below) food production networks, aimed at strengthening site-specific ecological approaches that provide multi-functional and rural livelihood benefits while not excluding trade (we emphasize, that we don't advocate self sufficiency at household level; production should be market-oriented, by leaving not marketable goods for self-consumption). Such approach – locally-adapted mosaic production patterns that integrate global market concerns – was termed by the Millennium Ecosystem Assessment (MEA) "glocalization", which we think should be given more attention today.²⁸

Based on the above, we would see the following guiding principles for future agricultural trade.

c) Guiding principles for agricultural trade

i) The pre-eminence of overall land-use

Given that agricultural land is scarce, to feed 9 billion people every patch of suitable land is needed for cultivation. Agricultural production cannot only concentrate on most favoured regions, as the common trade theory would suggest. *All* available land has to be used – so every region has to be productive and lesser favoured regions have to contribute their share. So sub-optimum use has to be integrated into the overall food supply strategy.

Box 4: Avoiding confusion on the terms "regional" and "local"

The emphasis on the promotion of regionalized or 'localized' food production does not suggest an anti-globalization, nor a pro self-sufficiency drive. Rather, we are convinced that producing for customers in regional/local markets (and using surplus produce for home consumption and trade) is a more sustainable mode of production from a reproductive angle. The terms 'regional' or 'local' denote an overseeable geographical region like a district, county or province that might extend across borders. In the following we use the term "regional/local" to clarify, that we don't mean the village-level, but rather a county or provincial level.

ii) *The pre-eminence of diversity*

As outlined above, diversity is a key component of agriculture. The specialization potential is therefore limited. Due to diversity requirements regions cannot concentrate solely on one crop. A minimum of diversity requires a mix of products (crop rotation), where not every crop can have a comparative advantage. Diverse production patterns buffer price hikes and guaranty a more stable profit. And diversity is a nutritional requirement, too. Last, but not least, diversity is imperative for improving the future resilience of agriculture to climate change. Thus it makes sense to primarily orient diverse production patterns towards local demand.²⁹

iii) *The pre-eminence of regional/local food production*

Regional/local food production and consumption is being identified as a new mega trend.³⁰ Regional/local production has benefits on environmental and social grounds. On the social side, more regionally/locally-oriented market relations promise more decent jobs in rural areas not only in agriculture, but in rural support services as it creates a rural economy. The environmental benefits of a regional/local focus are primarily in diverse production patterns, which – through more mosaic-like structures – serve biodiversity issues better, increase close nutrient cycles, tend to reduce external input use and strengthen resilience of the production and the eco-system at large.³¹

Moreover, there is growing preference of people for regional/local production due to trust and identification. People want to have a close relationship with their food and food producers. Besides, freshness is of growing value. Such food is best produced regionally/locally and imports complement in terms of addition and supplementation, availability, seasonality and cultural diversity.³² Traded goods should also be resorted to in cases where local products would have a distinct negative environmental or social impact, such as greenhouse production in winter, intensive irrigation or long-term cold storage. This is a fundamentally different approach to the comparative advantage/free trade model that concentrates specialized production in the most favourable production sites, leaving the distribution to (global) trade.

Moreover, food safety issues play an important part in this regard. The recent horse meat scandal in Europe has made visible, how vulnerable large cascaded value chains in food production are. Not the least against this background, food industries

increasingly tend to source locally.³³ Politics should follow suit in adjusting concerned policies.

iv) *The pre-eminence on specialties*

Export in relation to food should be focused on specialties (where the value added is high) and surplus produce. Agricultural specialties mirror necessarily the origin – and originality – of the region as well as comparative physical and climatic advantages. The trade system needs to facilitate and supplement such approaches and structures, rather than wheeling the baton of mass-production and the “industrialization” logic.³⁴

v) *Trade as a complement*

Trade is a driver for prosperity. Disregarding perverse subsidies, trade drives costs down, which makes food more affordable and accessible. Trade also contributes to cultural diversity of food. At the same time, (hyper-)liberalized trade concepts find their limits when it comes to too narrow specialization, mono-cropping, high market-power concentration, and erosion of local and regional identities and cultures. Trade in food should not, or not primarily, replace localized supply,³⁵ but rather complement it.

If these preconditions were met, food security and the environmental crisis of agriculture could be addressed in a pro-active and constructive manner.³⁶

d) The new trade formula

As a guiding principle for future trade in agricultural goods we suggest the formula: “Regional is first choice”, or, to read it differently: “as much regionalized/localized food production as possible; as much traded food as necessary”.

For the time being, as externalities are mainly not internalized, carbon taxes are the rare exception rather than the rule and carbon-offset markets are largely dysfunctional – all of which factors that would prioritize regional/local production through ‘logical’ market mechanisms – regional/local preferences like “buy local” schemes should be respected by trade rules.

Systematic concentration on globalized food supply is partly undermining the endeavour of establishing regionally/locally appropriate and truly sustainable production and consumption patterns (if there is too much export orientation and therefore specialization, there are too many import surges, too much focus on just economic efficiency, and too little heed paid to the

multi-functionality, reproductive and resilience capacity of agriculture) (Howse and Teitel, 2007: 11).

It makes a difference whether enhanced regionally/locally-focused production and consumption happen more by chance – through higher priced consumer preferences – despite a general export orientation, or whether the regional/local focus is part of a strategy, and any surplus is traded away in an organized manner. It would be a task for trade policies to shape adequate normative rules that create the right incentive structure in this regard.³⁷ Karapinar and Häberli (2010) advocate a “rainbow revolution” (instead of “just” a green revolution) in this respect, where tailor made approaches to each specific locality are tackled in a broad inclusive approach.

Against the background of these principles, what can be achieved with the current trade-rule tool box?

M. The current trade tool box in regard to regional/local food supply

Some of the applied WTO rules include a range of policy measures that are of some support to regional/local food production:

- The provisions on the “green box” in Annex II of the AoA.³⁸
- The use of the *de minimis* provision on trade-distorting support (up to 10 per cent of the total value of agricultural production and 10 per cent of the value of any specific crop in a given year for most developing countries).
- regional content requirements; and
- geographical indications (to be extended to food items).

But these rules have an overall limited effect on fostering regional/local food production and consumption. The achievement of food security is basically treated by the existing WTO rules as grounds for exception for a very limited range of trade liberalization measures (De Schutter, 2011c:16).

As pointed out in the lead article of this chapter by Lim Li Ching and Martin Khor, there is still quite some room for improvement in fully exploiting existing flexibilities on SDT, SSM and SP as well as the green box to achieve a better level of food security. No doubt, this track should be followed. Yet, with the benefit of hindsight, it seems to be far more complex for interested governments to turn concept into action in this regard.

First, to be effective, such approach requires a clear willingness and strategy by concerned governments. Due to the neo-liberal policies of the last decades and the current financial crisis states have been weakened in their regulatory and financial capacity to devise such strategies. Second, proactively exploiting the flexibilities in the existing WTO tool-box also requires a level of co-operation and tolerance by other WTO member countries.

The ‘jobs and growth’ dependency of states and the interest of commercial pressure groups that profit from the status quo, who have contributed to shaping and building up current neo-liberal market structures, may stand against the required level of co-operation and tolerance. Third, in particular developing countries err on the side of caution not to violate WTO commitments. Their governments are thus not very likely to launch policies that fully exploit the flexibilities in the WTO agreements without strong assurance and confidence that these initiatives might not negatively affect third parties’ commercial interests and leave them exposed to potential litigation (De Schutter, 2011c:3). Fourth, existing flexibilities can be limited or made difficult to exploit by regional or bilateral trade agreements that create WTO-plus disciplines.

All in all, the existing flexibilities in WTO rules are not sufficient and are unlikely to be fully exploited.

N. Already existing regional/local food approaches

In the light of the growing concern of citizens on where their food comes from³⁹, many retail businesses already offer growing numbers of regional products. Regarding a higher level of food sovereignty and the growing role of civil society in this respect, some contours of regional food policy councils⁴⁰ or localized/regional food networks are already visible.⁴¹ These regionalized/localized food networks make decisions on their food, as it already happens today when regions call themselves “GMO free region”, for example (others might opt for GMOs). The Brazilian city Belo Horizonte⁴² is a good example on how a regional/local structured pattern has overcome the food security problem in a very short time (Belo Horizonte then became the blueprint for the “fome zero” programme which nearly eradicated hunger in Brazil).

Trade rules would have to tolerate and public and private procurement would have to accept such sys-

terms of preferences for regional/local produce. Where people decide consciously about their food and nutrition, this should not be overruled by any, particularly mercantilist doctrine.

O. Outlook

There are many reasons why the situation of food security and the environmental crisis of agriculture is unsatisfactory today. If we seriously want to achieve food security, practice equality and protect the planet, having already crossed some planetary boundaries, the current system needs adjustment. For the future, we have to think out of the box. To respect the principal regional/local nature of agriculture and adjust related policies could be one of the first steps. What is re-

quired is a strengthening of regional and site-specific holistic approaches that provide diverse benefits as part of more localized food production networks. It should however be emphasized in this regard that it is not our intention to create new protectionist measures. Rather, we want to advocate a more reasonable food-market approach, which harnesses the potential of really sustainable agricultural production to (i) enhance sustainable productivity of the whole production system (not only individual products); (ii) assure food security and rural livelihoods; (iii) reflect and capitalize on the diversity of agriculture to assure its re-productive capacity; (iv) strengthen functional bio-diversity, and (v) build up resilience to resource constraints and climate change as well as improve agriculture's climate mitigation potential.

Commentary II: From Dumping to Volatility: The Lessons of Trade Liberalization for Agriculture

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Abstract

The weakening of agricultural, financial and trade rules has contributed significantly to increased volatility and corporate concentration in agricultural markets. This increased volatility is harmful to long-term investments to protect the environment and build climate resilience in agriculture. Public investment and regulation is needed to ensure stable food supplies and fair prices, and to facilitate a shift to sustainable agricultural practices.

Much of the international debate on trade and agriculture, from the founding of the World Trade Organization (WTO) to the recent rise of agricultural commodity prices, has focused on the damaging effects of agricultural dumping (i.e. exporting at below cost of production) by agribusiness corporations based in the EU and the United States. Since 2008, as a result of the global food price crisis, this focus has shifted to concerns about price volatility. But both dumping and volatility are symptoms of the same bad policy decisions: a weakening of government oversight in setting and implementing agricultural, financial and trade rules. While this approach has been a boon to agribusiness companies operating around the globe, it has been damaging to farmers and those struggling with food insecurity. Equally important, this era of volatility threatens to overwhelm efforts to transition to more resilient, ecologically friendly agricultural production that is essential in the present context of climate change. The international debate needs to shift once again to a focus on the right kinds of rules to rebuild resilient food systems. Substantive structural reforms of agricultural, financial and trade policies would be a major step forward.

A. Liberalizing trade and increasing food insecurity

The liberalization of trade rules greatly accelerated in 1994 with the passage of the North American Free Trade Agreement (NAFTA), which set the standard for subsequent bilateral and regional trade agreements involving the United States, such as the Central America-Dominican Republic-United States Free Trade Agreement (CAFTA), and those negotiated

between Mexico and other trading partners. It also influenced the nature of trade deals pursued by the EU. Shortly after the passage of NAFTA, the WTO came into being in 1995, and various WTO agreements (particularly the Agreement on Agriculture) induced the further opening up of markets in developing countries. These bilateral and multilateral agreements limited the policy options available to these countries to protect their farmers from dumped imports and to support their farmers in boosting food production. This wave of agreements to liberalize trade and deregulate capital movements opened developing economies to foreign corporate investment that focused on expanding large-scale industrial food production for export. As a result of these changes, many countries that had previously produced most of their own food became dependent on imports. A dramatic example is that of Haiti, which produced 80 per cent of its rice requirements in the 1980s, but now, following decades of deregulation and liberalization, imports 80 per cent of its rice (Guereña, 2010).

During the WTO's first decade of existence, dumping by multinational agribusiness companies was both widespread and highly destructive. The Institute for Agriculture and Trade Policy (IATP, 2005) calculated dumping margins for United States commodity crops during the period 1990–2003 and found that wheat, corn, soybeans, rice and cotton were consistently exported at well below the cost of production (ranging from 10 per cent for corn to more than 50 per cent for cotton). A subsequent study by Wise (2010) also found that dumping of United States commodity crops and meat on Mexico was commonplace during the period 1997–2005.

While trade liberalization, or free trade, was touted as a way to improve food security, it has unquestionably failed (Murphy, 2009). Floods of dumped imports, especially during the harvest, can be devastating for developing-country farmers, and they increase dependence on food imports. Additionally, trade rules have facilitated the further concentration of global food supply in large private firms, thereby disempowering not only farmers and consumers, but even governments. Dependence on this increasingly concentrated global food supply chain, dominated by private players, increases importing countries' vulnerability to shocks, whether from extreme weather events or excessive financial speculation in agricultural commodity markets. Moreover, the shift towards a greater role for the private sector in managing the global food supply has coincided with rising global rates of hunger – from 788 million worldwide in 1995–1997 to 925 million in 2010 (FAO, 2011).

B. United States agricultural policy: Freedom to fail

Working in tandem with efforts to further liberalize trade, United States farm policy has retreated from its traditional role in managing agricultural markets. Over the past half century, the country's agricultural policy has shifted from a system of supply management that helped moderate prices for both farmers and consumers, to a system more dependent on so-called free-market forces. This transition culminated in the 1996 Farm Bill (known as Freedom to Farm), which removed the last vestiges of supply and price management (except for sugar), ostensibly to allow farmers to respond to market prices and export to new markets overseas. But as farmers expanded production with no supply management, agricultural commodity prices collapsed. The following decade of low prices – often below the cost of production – not only led to increased dumping on export markets, but also spurred the United States Congress to attempt to compensate for its policy failure by approving a series of emergency subsidy payments, and ultimately making those payments permanent in the 2002 Farm Bill.

During this decade of low prices and increased dumping, United States farm subsidy payments soared, peaking in 2000 and 2001, and again in 2005. But since 2005, payments to domestic farmers have steadily dropped as commodity prices have risen.⁴³ Higher commodity prices have not necessarily meant

higher profits for farmers. Costs of inputs, including seeds and fertilizer, have also dramatically increased, reducing the potential profits of small and medium-sized farmers in the United States (Wise, 2011; USDA, 2010). The cost/price squeeze accelerated the trend in United States agriculture away from small and medium-sized farms to very large farms that were able to spread costs over larger land areas. These large farms were also the beneficiaries of about 75 per cent of commodity programme subsidies. As a result, over the past 25 years, the number of small, commercially viable farms (with sales of between \$10,000 and \$250,000) has fallen by 40 per cent, and that of very large farms (with sales of more than \$1 million) has increased by 243 per cent (Hoppe, MacDonald and Korb, 2010). Also during this period, the percentage of United States agricultural production controlled by the top four firms in a given sector has increased substantially. For example, in beef packing it rose from 72 per cent in 1990 to 83.5 per cent in 2005 (Hendrickson and Heffernan, 2007).

EU subsidies to agriculture under the Common Agricultural Policy (CAP) are now largely decoupled (unconnected to production or prices, making them “minimally trade-distorting” to the WTO). While the true extent of the decoupling depends on how the subsidies are measured, total EU subsidies have not varied as dramatically as those of the United States over the past few years (Berthelot, 2011).⁴⁴ While the CAP differs substantively from the United States Farm Bill, the underlying challenge is the same – how to redirect support away from large-scale production for export towards programmes that can provide greater food security, rural livelihoods and a transition to sustainable agriculture. The current complex system of support enables agribusinesses to exploit the system to the detriment of farmers in both developing and developed countries.

C. Financial market deregulation

How financial markets and commodity futures markets are regulated is another factor that strongly affects agricultural production. A series of laws passed by the United States Congress, beginning in the early 1990s and culminating in 2004, succeeded in opening up commodity futures markets to a flood of new speculative money. In 2004, Hank Paulson, Treasury Secretary in the George W. Bush Administration and then chief executive officer of Goldman Sachs, successfully lobbied for an exemption from the rule that investment

banks maintain large enough currency reserves to cover their unsuccessful trades. The rule exemption freed billions of dollars that Goldman Sachs and four other banks used for high-risk investments, including commodity index fund bets (IATP, 2008). Commodity index funds (which deal in agriculture, energy and metals) exploited these new loopholes and flooded commodity markets with money, betting thereby to drive up prices, regardless of the market fundamentals of supply and demand. For example, in March 2008, the unregulated biggest players, Morgan Stanley and Goldman Sachs, owned 1.5 billion bushels of Chicago Board of Trade corn futures contracts, while all corn producers and processors had the means to hedge only 11 million bushels against price swings. These unregulated funds controlled 33 per cent of all United States agricultural futures contracts during the period 2006–2008 (Suppan, 2009). Most of this excessive speculative activity takes place in over-the-counter trading, which is traded off-exchange and is not subject to trade data reporting requirements, or to margin collateral and other requirements of regulated exchanges. When these Wall Street funds sold off their contracts in mid-2008, prices tumbled. Overleveraged financial firms, without reserves to cover losses, were insolvent counterparties to these risk bets until they were recapitalized by the United States Congress and taxpayers. Today, these same financial speculators continue to destabilize commodity markets in the United States and elsewhere (see also the comment of Müller in this chapter).

The role of excessive speculation on international agriculture markets has been well documented by a host of international agencies and research institutions, including, most recently, UNCTAD (2011). The UNCTAD report, through an analysis of data as well as extensive interviews with financial traders, describes the new forces of financialization in commodity markets, beginning in 2004, and their contribution to steadily rising prices and increasing volatility.

Finally, it is impossible to overstate the enormous costs of financial market deregulation to government budgets around the world. Agriculture has not been spared by the global financial collapse, as less and less money is now available for food aid, and for investments for increasing production in developing countries, for promoting sustainable agriculture and for agricultural adaptation to climate change, among many other needs.

D. Investments in ecological agriculture undermined by volatility

Extremely low agricultural commodity prices over the past two decades, followed by recent spikes in prices, discourage long-term investments in more sustainable, ecological agriculture that will benefit the environment, water quality and quantity, and the climate. When prices are low, farmers struggle to make a living, and focus almost exclusively on increasing production to make up for the low prices. When prices shoot up or are projected to increase, governments and academics often advise farmers to devote even more land to production, often in environmentally sensitive areas. This tension between the usually futile efforts to respond to prices and investments for long-term environmental sustainability is evident in recent challenges facing United States conservation programmes, specifically the Conservation Reserve Program (CRP) and the Conservation Stewardship Program (CSP).

The Conservation Reserve Program is part of the Farm Bill that pays farmers to set aside and protect marginal farmland from agricultural production. CRP land is critical to slowing down soil erosion, and protecting wildlife and waterways. Indeed, it has protected tens of millions of acres over the years. But this popular programme has seen a significant decline in participation as farmers have taken over more land for production in an attempt to benefit from rising commodity prices. From October 2008 to July 2010, 3.4 million acres of CRP land went back into farm production (Cowan, 2010).

The Conservation Stewardship Program is the country's largest conservation programme, covering 35 million acres nationwide, and it is accessible to all farmers regardless of size or type of crop production. It rewards farmers based on their conservation practices that protect the soil, water, air and natural resources. In past Farm Bills, the CSP was woefully underfunded. The 2008 Farm Bill took a major step forward by allowing an estimated 13 million acres to be eligible for CSP's multi-year contracts each year. Despite this funding increase, only 57 per cent of eligible farmers could participate in the programme in 2009 and 2010 because of a lack of funds, according to the United States Department of Agriculture (USDA). And the programme is likely to face cutbacks under current efforts to reduce government debt. A 2012 budget bill passed by the House of Representatives in June 2011 would cut over \$1 billion in conservation

spending, including \$210 million directly from the CSP (currently funded at \$1.2 billion a year), and potentially force the USDA to break contracts with farmers that were signed earlier this year.⁴⁵ It is unclear exactly how much funding for conservation programmes will be cut as part of the recent debt ceiling bill passed in August 2011. Although some conservation programmes in the United States Farm Bill support practices that will both reduce carbon emissions and increase adaptation to climate change, the bill does not explicitly address climate change. Despite the lack of comprehensive climate change legislation, the Obama Administration and the USDA have strongly supported treating agriculture largely as a source of carbon emission offset credits for polluters participating in a carbon market. This perspective on agriculture's place within climate policy is reflected in a June 2011 USDA announcement of grants for projects geared almost entirely to measuring GHG emission reductions, and how those reductions could be converted into offset credits for a carbon market (USDA, 2011). There are no government plans or significant resources focused on helping agriculture in the United States to transition towards more climate-resilient practices and production.

The expected cuts in conservation programmes in the United States, and the denial by Congress of climate change as a major destabilizing factor in agricultural production are in contrast with Europe's climate change orientation within its Common Agricultural Policy. That climate change is happening and must be addressed in agriculture policy is understood within the CAP. In May 2011 the European Parliament's Agriculture Committee agreed to maintain funding for agriculture and to increase its emphasis on producing enough food while improving environmental practices. In addition to increasing incentives for sustainable production, the EU will more directly link payments to "greening measures" that reduce GHG emissions (EurActiv, 2011).

E. From volatility to sustainability

The seeds of current price and supply volatility in agricultural markets were planted several decades

ago through a series of policy decisions that have gradually strengthened the hold of large agribusinesses over markets and disempowered both farmers and countries struggling with food insecurity. To help address the enormous challenges related to food insecurity and environmental and climate degradation in the coming years, market reforms are needed to make agriculture more economically and environmentally sustainable. The issue is not only related to trade; it also involves disentangling local food economies from the grips of vulnerable supply chains dominated by transnational corporations. It is not only about whether subsidies are right or wrong, but rather how best to invest public money and establish regulatory oversight to create the right food system. A new set of values must be injected into policy-making that gives priority to food security, farmers' livelihoods, environmental sustainability and resilience, and democratic decision-making.

The following are some initial steps that should be taken:

- A reassessment of trade rules to enable developing countries to protect and support sectors vital to their food security and rural livelihoods.
- Support for the establishment of food reserves as a tool to mitigate price and supply volatility and strengthen food security when domestic production fails.
- Prevention of excessive speculation in commodity markets through the establishment of commodity-specific position limits and increased transparency in over-the-counter trading.
- Greater investment in agroecological farming practices, as outlined in the reports of the International Assessment of Agricultural Knowledge Science and Technology for Development (IAASTD, 2008), to strengthen both food security and resilience to climate change, with an emphasis on supporting small-scale farmers, particularly women.
- Reform of national farm policies, particularly the United States Farm Bill and the EU's Common Agricultural Policy, to eliminate dumping, encourage environmental sustainability and prevent oligopolistic control of market prices and practices.

Commentary III: Rethinking Food Security Strategies in Times of Climate Change: The Case for Regionalization of Agricultural Trade and Local Markets

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Abstract

A sustainable transformation of small farm systems in developing countries will only succeed if it is integrated into overall agricultural and food development strategies. Issues concerning the agricultural trading system, as one of the major drivers of the existing food production system, need to be linked to the debate on agriculture's contribution to adaptation and climate change mitigation. Since trade liberalization and export orientation tend to undermine adaptive strategies and encourage input-intensive, "climate-unfriendly" farming, the sustainable transformation of the agricultural sector requires a fundamental rethinking of current trade policies.

The principle of "economic subsidiarity" offers guidance for this transformation (Sachs and Santarius, 2007). It implies that economic exchanges in the food system should be carried out preferably at the local and national levels, while exchanges at the continental or global level should have only a complementary function.

In many developing countries, agriculture is the main source of rural livelihoods and the foremost provider of employment. More than one third of the world's population derive their livelihoods from land, growing food for their families and for local markets – primarily staples grown mainly on small land holdings. Thus, small farm systems de facto remain the backbone of food security in developing countries even today.

However, rural poverty and rural hunger are widespread, and the majority of all poor and hungry people worldwide live in rural areas (IFAD, 2010). To address this situation, governments need to rethink current food security strategies. Since the 1980s, policies concerning food security have been increasingly trade-oriented. Due to low world market prices, cheap imports of food products have been favoured over national production for achieving food security. Moreover, it has been a common belief that overall economic growth would automatically lead to the alleviation of hunger (FAO, 2008), and that the integration of small and medium farmers into export-oriented, global value chains would help reduce poverty and hunger in developing countries.

Yet, looking at small producers and the food security situation in various developing countries today, overall, this strategy has not delivered. On the contrary, food insecurity and poverty in rural areas

have increased in recent years (FAO, 2008). Small producers have faced multiple crises, among them high price volatility, the economic downturn due to the global financial and economic crisis, and weather extremes due to climate change – all of which have exacerbated each other (Fan and Heady, 2010). Since small producers often have limited adaptive capacity and resilience to adequately react to external shocks, the level of uncertainty, in particular, threatens their economic situation. All signs point to this level of uncertainty increasing as a result of a worsening of anthropogenic climate change in the coming years and decades.

Therefore, it is necessary to rethink current food security strategies, including the role and system of agricultural trade in the light of global warming. Food security strategies now have to cope with three challenges:

- (i) agricultural production is becoming increasingly affected by changing climatic conditions;
- (ii) in parallel, agriculture markets are being destabilized by climatic impacts; and
- (iii) at the same time, agriculture has to contribute to mitigating climate change and must augment its carbon sink capacities, rather than remaining a major source of greenhouse gas emissions. Given these challenges, food security strategies that rely

on trade and that push for the further integration of developing countries' food production systems in the global market are not appropriate.

In this paper, we first analyse how the present system of globalized agricultural production and marketing exacerbates anthropogenic climate change, and why small producers that are integrated into global value chains are particularly at risk due to climate change. We then discuss how the current pattern of agricultural trade and production should be modified in order to stop the vicious circle of increased trade-orientation exacerbating climate change, and increased climate change endangering small farmers' food security. Finally, we present policies for a regionalization of agricultural trade flows and the integration of smallholders in local and regional markets.

A. The global agricultural trading system is contributing to climate change...

Humans have exchanged agricultural products ever since they started farming. The main purpose of those trade flows was to supplement the diet with products that could only be grown in other climatic zones and geographical settings. With trade liberalization, trade in agriculture started to serve an additional purpose: to advance economic efficiency through increased competition among producers worldwide. Agricultural production can respond to increased competition in a number of ways, two of which, in particular, can have negative impacts on climate, namely an expansion of the area under cultivation, and specialization and intensification of production processes.

The expansion of agriculture is the main reason for the clearing of primary forests, and for the conversion of natural prairies to land for growing crops or for livestock grazing. It is also responsible for the draining of wetlands for irrigation and cultivation (CBD, 2003). Today, changes in land use in agriculture and forestry, as well as emissions from farming and livestock, contribute over 30 per cent to global anthropogenic GHG emissions, releasing in particular methane, nitrous oxide, and, to a lesser extent, carbon dioxide (IPCC, 2007a; see also the comment of GRAIN in chapter 1 of this Review). The conversion of tropical forests and savannahs into agricultural land is particularly emission-intensive, primarily due to the burning of the biomass originally existing on the land, and to the release of organic carbon stored in soils (Steffen et al., 2004).

Besides the conversion of land for agriculture, increased specialization and intensification of production, which enables farmers to participate in global markets, generally entails the greater use of pesticides, fertilizers, water and fuel. Huge amounts of GHGs are emitted through the production and use of external inputs, such as agrochemicals, farm machinery and pumped irrigation. In the United States, for example, farm inputs account for more than 90 per cent of the total direct and indirect energy used in agriculture (Saunders, 2004). Likewise, downstream emissions increase as the processing, packaging and retailing of food items that are exported become more energy-intensive.

At the same time, growing competition is likely to undercut less intensive farming practices that sustain a broad variety of crops, hedges, trees and cultural landscapes, and thus threatens small-scale, site-oriented, integrated farming systems, particularly in developing countries (CBD, 2003). For instance, with animals moving from pastures to intensive feed-lot production, and the number of cattle, pigs and poultry steadily increasing to meet growing meat-based diets, more methane is released from enteric fermentation and animal waste; in contrast, grass-fed animals emit less methane than livestock that is fed on a high protein diet (Saunders, 2004; Kotschi and Müller-Sämman, 2004; see also the lead article of Idel and Reichert in chapter 2 of this Review).

In addition to the impacts of climate change from the intensification and expansion of agricultural production for export, the overall volume of transport increases as trade grows. Average distances of food shipments are set to increase even more, as fresh fruit reach Europe from India, for instance, and soybean shipments from Brazil to China rise. However, the explosion of food miles is the Achilles' heel of global value chains in agriculture, making them vulnerable to steep rises in oil price and the impacts of climate change.

B. ...while climate change is endangering small producers

Notwithstanding these environmental challenges, and a growing awareness of climate-change-related issues, efforts to integrate small and medium producers into global value chains continue unabated. Marketing chains are being improved and small producers are being encouraged and assisted in complying with

international private and public food quality and safety standards (see, for example, Humphrey, 2005; and Pingali, Khwaja and Meijer, 2005). Small producers in global value chains have always faced certain risks because usually they are the least powerful and most vulnerable players in the chain, and because they are price takers for both their production inputs and their output. Moreover, they are often confronted with a fragile balance between (a) production for the market, and thus income generation, (b) production for their own consumption, and (c) household expenditure for food. However, these three aspects are increasingly affected by changing temperatures, more frequent weather extremes such as droughts or heavy rains, and growing instability of ecosystem services. Thus climate change has become an important factor in destabilizing the fragile food security situation of small producers in global value chains.

Looking at smallholders' production for the market, participation in global value chains often demands specialization in a few cash crops and an intensification of production. As a consequence, many farmers have given up more diversified production systems, such as mixed cropping. However, mixed cropping is much better suited to coping with the impacts of climate change. In contrast, if weather extremes or newly introduced parasites hit the few cash crops grown in specialized farms, producers risk a total loss of their harvest. Furthermore, as specialization is at odds with sustainable land and water management, it decreases rather than builds up soil fertility. And a poor soil structure risks erosion and reduces the soil's ability to capture water and store carbon. This too weakens the ability of the production system to cope with extreme droughts or heavy rains. Thus sustainable soil and water management are undisputedly among the most important elements for agricultural adaptation and for the resilience of small producers.

As specialized smallholders must rely on buying their own food from the market, they risk being hit twice by the impacts of climate change. An increasingly volatile and fragile global food production system due to climate change means that small producers face a higher risk not only of production losses, but also of sharply increasing food prices. The volatility of food prices has increased tremendously over the past few years, in part due to harvest losses resulting from climate change. Yet several studies show that high prices on world markets are seldom passed on to benefit small producers; rather, they are often

transferred directly to consumer prices (see, for example, Jha, 2007; and Höffler and Ochieng, 2009). Thus small producers face the prospect of having to spend more money to buy their food while their incomes either fall or remain stagnant.

C. Rethinking the economics of developing countries' food systems

Over the course of the past few decades, various concepts and strategies have been developed that both reconcile agriculture with ecological cycles and at the same time give small producers greater economic stability and resilience. Examples of such strategies include resource-conserving agriculture, agroecology and organic agriculture (see, for example, Altieri and von der Weid, 2000; Pretty, 1995; and Pretty et al., 2006). The FAO has recently called for a significant transformation of the agricultural sector in order to meet climate change and food security challenges. The FAO's concept of "climate smart" agriculture aims to sustainably increase productivity, enhance resilience (adaptive capacity) and reduce GHGs (mitigation), and thus contribute to the achievement of national food security and development goals (FAO, 2010).

However, these strategies mark only the beginning of a sustainable reform of the food system. As they neglect to take trade and economic conditions into account, they risk succumbing to high price volatility, import surges and unregulated competition, as well as to the overwhelming power of food companies (e.g. processors, retailers and distributors) in the global trade arena. Increasingly, this is occurring even in the newly globalized market for organic produce. As long as market incentives remain unchanged, investments in business-as-usual practices will continue.

A sustainable transformation of small farm systems in developing countries will only succeed if it is integrated into overall agricultural and food development strategies. Issues concerning the agricultural trading system, as one of the major drivers of the existing food production system, need to be linked to the debate on agriculture's contribution to adaptation and climate change mitigation. Since trade liberalization and export orientation tend to undermine adaptive strategies and encourage input-intensive, "climate-unfriendly" farming, the sustainable transformation of the agricultural sector requires a fundamental rethinking of current trade policies.

The principle of “economic subsidiarity” offers guidance for this transformation (Sachs and Santarius, 2007). It implies that economic exchanges in the food system should be carried out preferably at the local and national levels, while exchanges at the continental or global level should have only a complementary function. Economic subsidiarity aims at localizing economic activities whenever possible and reasonable, and is committed to shorter rather than longer commodity chains. Instead of endangering small producers through volatile world market prices and making them the hubs for the extraction of capital, goods and resources, the regionalization of trade flows could serve as a catalyst to spur sustainable development at the local level. It will be successful particularly if production involves forward and backward linkages with other sectors of the local economy, such as with local input providers, processors and traditional retail outlets. If smallholder agriculture is well integrated into the local economy, and rural non-farm employment in the production of off-farm goods and services is stimulated, the regionalization of trade flows will contribute significantly to poverty alleviation and to overall economic development (see also, FAO, 2005).

D. Policies to promote sustainable local food systems

In order to launch a transition towards a (re-)regionalization of trade flows, and to foster short production chains, policy changes are required at subnational, national and international levels. At the national level, first and foremost governments need to ensure that they are allowed sufficient policy space vis-à-vis existing bilateral and multilateral trade obligations. This includes allowing governments adequate space to stabilize domestic food prices and protect small farmers from excessive price volatility. Countries also need to be able to implement policies and measures that chart their own defined paths to sustainable agriculture and food systems (see this chapter’s lead article by Li and Khor). Policy space not only implies having more flexibility in the use of tariffs, quotas and other border control measures; it also, implies freedom from constraints imposed by bilateral and multilateral agreements on domestic regulatory competence or on investments which influence the agricultural sector’s production structure.

The main task at the subnational level is to enable small farmers to regain long-term access to their

domestic and local markets. First and foremost, this includes policies that go beyond trade, which protect the land rights of communities and their access to basic natural resources, and especially those that strengthen women’s rights and land entitlements. Policies should promote a decentralized rural infrastructure to foster local marketing and ensure that rural and urban areas are sufficiently connected so that the hinterlands become the main suppliers of food for towns and cities. Most importantly, small farmers should be supported in achieving a “critical economic mass” through associative forms of economic activity, such as cooperative forms of production, storing and marketing. Developing-country governments as well as international donors should provide institutional and financial support, including public finances for microcredit and loan programmes, to foster such associations.

Furthermore, a range of policies that have proved viable in the past could accelerate the transition from conventional to more sustainable farming practices. For instance, penalizing polluters with taxes and levies will induce them to reduce their emissions. Subsidies for fertilizers and pesticides should be abolished, and taxes on fertilizers and other industrial farm inputs imposed or increased so as to accelerate the transition towards farming practices that cultivate on-farm nutrient cycles. In addition, governments could foster the development of sustainable agricultural process and production standards, including standard monitoring and verification schemes. The implementation of such schemes could be supported by low-interest loans for investing in sustainable farming practices. Those loans could be offered by communities, national governments and international donors. If farmers’ training and field schools for sustainable farming practices are supported, and if the capacities of local NGOs are scaled up, this will catalyse further activities in the farming communities and generate local ownership in the process. Last but not least, communication strategies that provide better information to the public could promote a shift in consumption patterns towards more sustainable and locally produced food items.

The transition towards more sustainable food systems can be further advanced through a set of policies at various multilateral forums. In particular, policies that make long-distance transportation more expensive could contribute significantly to the (re-)regionalization of production chains. Since agricultural trade is very

transport-intensive, the expansion of global markets and value chains would not have been profitable if freight costs had been high. In particular, foreign products can compete in domestic markets (e.g. Brazilian chicken legs competing with local poultry in West Africa) only if transport costs are low; otherwise, the lower marginal production costs abroad would soon be negated by higher transport costs. Over and above the rising oil prices that can be expected

in the face of the global peak oil scenario, measures to internalize environmental costs in transport prices should be pursued. For instance, the inclusion of air traffic in the European Emissions Trading Scheme is a first step in this direction. Additional measures could be advanced through negotiations at the United Nations Framework Convention on Climate Change, the International Civil Aviation Organization, and the World Maritime Organization.

Commentary IV: Getting Farmers off the Treadmill: Addressing Concentration in Agricultural Inputs, Processing and Retail Markets

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Abstract

As corporations become bigger and fewer at both ends of the agricultural value chain, farmers are sandwiched between the spiralling costs of agricultural inputs dictated by the seed and agrochemical companies and the ever-increasing pressures on the prices of their produce imposed by mega-processors and mega-retailers that gobble up available supply in the market. This has grave adverse impacts on the local economies and on the livelihoods of farmers, on local food security and community resilience, and on biodiversity and the environment.

The dominant market structure and policy approach of the prevailing model of industrial agriculture have resulted in concentration and control by a handful of giant corporations over agricultural inputs, processing and retail markets. This allows them to dictate the prices of both inputs and produce. Oligopolies upstream and downstream of the agricultural market pose serious threats to world food security, aggravate climate change, imperil the livelihoods of millions of people and communities that depend on agriculture and greatly reduce their resilience to environmental and human-induced shocks. The paradigm of accumulation underlying this agricultural

model breeds income disparity and highly skewed power relations. The resulting social inequity and environmental degradation effectively cancels out the supposed benefits from higher productivity and more efficient production systems.

A. Corporate concentration in agricultural inputs, processing and retailing

About 73 per cent of the total global commercial market for seeds, estimated at \$27.4 billion, was controlled by the top 10 companies in 2009 (ETC Group, 2011b). Just three companies controlled 53 per cent of that

Table 2: World's top 10 seed companies, 2009

Companies by ranking	Seed sales (\$ million)	Market share (per cent)
1. Monsanto (United States)	7 297	27
2. DuPont (Pioneer) (United States)	4 641	17
3. Syngenta (Switzerland)	2 564	9
4. Groupe Limagrain (France)	1 252	5
5. Land O' Lakes/Winfield Solutions (United States)	1 100	4
6. KWS AG (Germany)	997	4
7. Bayer CropScience (Germany)	700	3
8. Dow AgroSciences (United States)	635	2
9. Sakata (Japan)	491	2
10. DLF-Trifolium A/S (Denmark)	385	1
Total sales and market shares of the top 10	20 062	73

Source: ETC Group (companies' reporting, currencies have been converted to US dollars using historical average exchange rates).

Table 3: World's top 10 agrochemical companies, 2009

Companies by ranking	Agrochemical sales (\$ million)	Market share (per cent)
1. Syngenta (Switzerland)	8 491	19
2. Bayer CropScience (Germany)	7 544	17
3. BASF (Germany)	5 007	11
4. Monsanto (United States)	4 427	10
5. Dow AgroSciences (United States)	3 902	9
6. DuPont (United States)	2 403	5
7. Sumitomo Chemical (Japan)	2 374	5
8. Nufarm (Australia)	2 082	5
9. Makteshim-Agan Industries (Israel)	2 042	5
10. Arysta LifeScience (Japan)	1 196	3
Total sales and market shares of top 10	39 468	89

Source: ETC Group (companies' reporting, currencies have been converted to US dollars using historical average exchange rates).

total market, with Monsanto – the world’s largest seed company and fourth largest pesticide company – accounting for 27 per cent of the world’s commercial seed market (table 2).

The commercial seed sector, which supplies an estimated 20 per cent of the total seed requirements globally, is inextricably linked to the agrochemical market. Of the top six agrochemical companies, five are among the world’s largest seed companies. Nearly 90 per cent of the world market for agricultural chemicals in 2009, estimated at \$44 billion, was controlled by the top 10 pesticide companies (UK Food Group, 2010; ETC Group, 2011b). The top six companies, which sell proprietary formulas, accounted for over 72 per cent of the global agrochemical market (table 3).

Intellectual property rights (IPRs) such as patents, trade secrets and plant variety protection are key to protecting the business interests of giant corporations by allowing them monopoly control over their proprietary products and processes (Heinemann, 2009; IAASTD, 2009). Companies use patents to edge out competitors and impede further innovation on proprietary products and processes which could otherwise be adopted or improved on by others. Anticipating the devastating effects of climate change on agriculture, giant companies have started to position their commercial interests in the development of so-called “climate-

ready” or “climate-smart” crops. Between June 2008 and June 2010, the world’s six largest seed and agrochemical companies filed patent applications on traits and genes that developed crop resistance to abiotic stresses such as drought, pests and salinity (ETC Group, 2011a). The “patent grab” corresponds to 261 patent families involving 1,663 patent documents worldwide. Even in the face of the climate crisis, the profit motive reigns supreme among corporate players in the seed and agrochemical industries.

Oligopolistic trends also reverberate down the agricultural value chain, particularly in the processing and retailing sectors. In 2009, the 10 largest food and beverage companies accounted for more than 37 per cent of the total revenue of this sector (Leatherhead Food, cited in ETC Group, 2011b). The three largest companies – Nestlé, PepsiCo and Kraft – together control 45 per cent of the revenues generated by the world’s top 10 firms and 17 per cent of the revenues generated by the top 100 firms in the food processing sector (ibid.) (table 4).

In the retail market, the world’s 10 biggest retail companies had combined sales of \$753 billion in 2009, accounting for 41 per cent of the total revenues earned by the top 100 grocery retail firms valued at \$1.84 trillion (Planet Retail, cited in ETC Group, 2011b). The combined share of the top three supermarket

Table 4: World’s top 10 food and beverage companies, 2009

Companies by ranking	Food and beverage sales (\$ million)	Total sales (\$ million)	Market share (per cent)(as percentage of share of top 10)
1. Nestlé (Switzerland)	91 560	98 735	23.6
2. PepsiCo (United States)	43 232	43 232	11.2
3. Kraft (United States)	40 386	40 386	10.4
4. ABInBev (Belgium)	36 758	36 758	9.5
5. ADM (United States)	32 241	69 207	8.3
6. Coca-Cola (United States)	30 990	30 990	8.0
7. Mars Inc. (United States)	30 000	30 000	7.7
8. Unilever (The Netherlands)	29 180	55 310	7.5
9. Tyson Foods (United States)	26 704	26 704	6.9
10. Cargill (United States)	26 500	116 579	6.8
Total sales and market shares of the top 10	387 551	547 901	100

Source: Leatherhead Food Research, cited in ETC Group, 2011b

Table 5: World’s top 10 food retailers, 2009

Companies by ranking	Grocery sales (\$ million)	Market share (as percentage of share of top 10)	No. of countries of operation
1. Walmart (United States)	191 711	25.5	15
2. Carrefour (France)	104 290	13.9	34
3. Schwarz Group (Germany)	65 012	8.6	23
4. Tesco (United Kingdom)	63 288	8.4	14
5. Aldi (Germany)	62 268	8.3	15
6. Kroger (United States)	61 772	8.2	1
7. AEON (Japan)	52 874	7.0	9
8. Edeka (Germany)	51 625	6.9	2
9. Rewe Group (Germany)	51 435	6.8	14
10. Ahold (United Kingdom)	48 553	6.4	10
Total Top 10	752 829	100	

Source: Planet Retail at: <http://www.planetretail.net>.

chains – Walmart, Carrefour and Schwarz Group⁴⁶ – accounted for 48 per cent of the total revenues of the top 10 companies in that sector in 2009 (table 5).

As the purchasing power of consumers in emerging economies gains strength and the markets in many developed countries stagnate, the world's largest processors and retailers are rapidly moving into those economies. In particular, in Brazil, China, India and the Russian Federation, where demand is expanding and even outpacing that in industrialized countries. Giant supermarkets are scrambling to establish operations, forging joint ventures with major local retailers and swapping assets among them to ensure market dominance. In 2009, mergers and acquisitions in the food and beverage sector were valued at \$43 billion (IMAP, 2010).

1. Farmers and oligopolies in the agricultural value chain

As corporations become bigger and fewer at both ends of the agricultural value chain, farmers are sandwiched between the spiralling costs of agricultural inputs dictated by the seed and agrochemical giants and the ever-increasing pressures on the prices of their produce imposed by mega-processors and mega-retailers that gobble up available supply in the market. This has grave adverse impacts on the local economies and on the livelihoods of farmers, on local food security and community resilience, and on biodiversity and the environment.

2. High input costs and low product prices

While the commercial seed sector may represent only about 20 per cent of the total seed requirements of farmers worldwide, the oligopoly enjoyed by the large seed and agrochemical companies enables them to wield immense control over agricultural inputs in general. This is because commercial seeds are often developed by the same companies that sell pesticides, and are marketed in tandem with agricultural chemicals that are promoted to protect crops from pests and diseases and to yield higher and better quality produce. Furthermore, as a result of massive promotion and government support of agrochemicals for "crop protection", even farmers who depend on traditional sharing and exchange of seeds have become consumers of pesticides, herbicides and fungicides. The agrochemical market is dominated by giant pesticide companies that have the power to dictate the prices and supply of their products globally, at least

so long as the lifespan of the patents granted to them (usually 20 years).

In the processing and retailing sectors, companies claim to procure their products and raw materials locally through such schemes as contract growing and local partnerships. Nestlé, for example, boasts of innovative partnerships with local milk producers in Pakistan to supply its expanded operations in the country (Farming First, 2010). Walmart's 2009 annual report projects that its stores will buy from over one million Chinese farmers in 2011, which would further boost the mega-retailer's standing as China's sixth largest export market (Elliot, 2005 cited in ETC Group, 2011b). Such practices claim to increase farmers' incomes, but processing and retailing companies such as Walmart exert "never-ending downward pressure on its suppliers to provide it with increasingly lower prices that simply aren't sustainable" (Donnelly, 2011 cited in ETC Group, 2011b).

3. Disempowering farmers

Contract farming or commercial growing arrangements by processing and retailing companies in many developing countries often require farmers to use a package of commercial seeds, synthetic fertilizers and agrochemicals, and to adopt specific farming practices to comply with strict market requirements for uniformity, which are guaranteed by complying with strict processes and production standards such as GlobalGAP, at prices largely dictated by the often exclusive buyer. While documented cases show that contract farming generally increases income and improves technical capabilities of middle-income farmers, small-scale farmers face a power imbalance, social differentiation, risks of contract violations and an unsustainable environment resulting from the use of agrochemicals and uniform varieties in their small landholdings (Minot, 2007).

Some policies of governments and private banking institutions also explicitly or implicitly promote and support the use of commercial seeds and chemical inputs, such as providing crop insurance and production loans only to users of packages of agricultural inputs (IAASTD, 2009; Greenpeace, 2009). Such policies deter farmers from adopting eco-functional farming systems, thus effectively limiting the possibilities for them to exercise their rights to make decisions on their farms.

4. Monocropping and uniformity

In developing countries, the vast majority of farmers are still sourcing their seeds through traditional saving, reusing, sharing and exchange practices. However, giant seed companies are steadily expanding to these potentially lucrative markets to sell commercial seeds, often aided by governments in their efforts to increase commodity exports. Indeed, some governments are actively promoting and even supporting the use of commercial seeds touted by the corporations for increasing productivity. Massive promotion of commercial seeds breeds monocropping and uniformity, thereby pushing out traditional food crops and local varieties (Barker, 2007).

The highly mechanized bulk processing of food and feed products by processors also requires uniformity in terms of features and qualities of raw materials sourced from farmers. Retailers likewise impose on farmer-suppliers uniform quality requirements on standard varieties to cater to consumer demands and to facilitate bulk handling, packaging, storage and retail display.

5. Threats to local food security and livelihoods

Such pressure to produce for the market can have adverse impacts on local food security (Barker, 2007; Utviklingsfondet, 2010). Small-scale farmers caught up in contract farming and commercial growing arrangements often end up with no land to cultivate their households' food requirements and many lose their lands in cases of crop failures (Minot, 2007). Even those who grow food crops sometimes end up selling all their products and buying cheaper and lower quality food for their own consumption in the local market.

The expansion of mega-retail companies in many developing countries where the retail industry (including the so-called underground economy led mainly by women entrepreneurs) constitutes a major sector in the national economy poses a serious threat to local livelihoods. In India, for example, retail is the second-largest employer after the agricultural sector, employing some 33 million people (Arnoldy, 2010 and Nair-Ghaswalla, 2010, cited in ETC Group, 2011b) whose jobs and livelihoods are threatened by the entry of transnational mega-retail chains on the domestic scene.

Prevailing practices in the agricultural input, processing and retail industries also raise serious ethical questions about global food security. Decades of breeding

for higher yields and industrial farming practices have resulted in the decline of essential nutrients and minerals in the food supply (Jones, 2004, cited in ETC Group, 2009). Consumers and retailers in developed countries waste almost as much food annually (222 million tons) as the entire net food production of sub-Saharan Africa (230 million tons) (ETC Group, 2011).

6. Reducing farmers' resilience and capacity to adapt to the adverse impacts of climate change

Monocropping and uniformity adversely affect farmers' capacity to respond to environmental and human-induced stresses, since crop and varietal diversity in farms are the farmers' best insurance against the adverse effects of climatic change. IPRs on seeds impede farmers' rights to save, reuse, share and exchange seeds, and they reduce the capacity of communities for on-farm innovations and development of locally adapted varieties that respond to new environmental challenges (Heinemann, 2009).

7. Agriculture for equity and well-being

Agriculture for development has been so tragically narrowed down to increasing productivity in order to boost economic development by raising GDP, that it has not really translated into benefits for the majority of farmers who are still mired in poverty. The current industrial agriculture model breeds oligopolies across the agricultural value chain and is incompatible with an eco-functional agricultural system. The current system accumulates profits for a few at immeasurable costs to the environment and society. A shift to environmentally sustainable, socially equitable and economically viable agriculture will require a fundamental transformation of the dominant agricultural system and development model to one that promotes equity and the well-being of people and the planet as explicit goals.

8. Enabling sustainable economies

Agriculture as the backbone of the economy in most developing countries should support and promote rural livelihoods. Through strategic public investments as well as policies and support programmes that have an inherent bias to uplift smallholders and support eco-functional farming practices, productive activities on- and off-farm have the potential to create jobs and livelihoods in rural areas. This could effectively arrest the continuing tide of migration to cities and its associated negative social, economic and political consequences (IAASTD, 2009; Greenpeace, 2009;

Utviklingsfondet, 2010).

As a complement to interventions at the local and national levels, trade practices that breed oligopolies and inhibit competition need to be curbed at the global level. This requires stricter regulation of corporate practices, anti-trust actions and a moratorium on mergers and acquisitions (Barker, 2007; UK Food Group, 2010). IPRs and technological “advances” (e.g. hybridization, genetic engineering and terminator technology which inherently prohibits sharing, reuse and saving of seeds among farmers) that promote monopoly control over products and impede innovations by smaller players should be reviewed and corrected. Subsidies that benefit only the big players in the agricultural sector should be phased out, and policies that exert pressure on farmers to adopt commercial agricultural inputs reversed.

9. Conserving diversity

Long-term sustainability in agriculture can only be realized when supported by healthy ecological and biologically diverse ecosystems. Crop and varietal diversity are the smallholder farmers’ best insurance against crop failures, agro-ecological stresses and climate change (Ho, 2008; IAASTD, 2009; UK Food Group, 2010). Diversity nurtured on-farm by farmers provides a wealth of healthy and sustainable products that can cater to the demands of consumers who are becoming increasingly aware of environmental, health and food issues. On-farm and *in-situ* conservation of agricultural biodiversity should be promoted and supported by providing appropriate incentives and recognition to farmers and communities. In addition, the rights and access of communities to these resources need to be protected from misappropriation and biopiracy.

10. Empowering smallholders

Governments can play a key role in increasing the quality and quantity of public investment in agriculture, and making product markets work better for smallholders (World Bank, 2008). The performance of small-scale producer organizations and smallholders practicing agroecological farming can be enhanced by building their capabilities, facilitating their access to financial services, improving price incentives and reducing their exposure to uninsured risks (IAASTD, 2009; World Bank, 2008).

Beyond economic empowerment, some fundamental steps towards empowering smallholders include protecting their tenure rights over land, improving

their access to productive resources, increasing their political voice and enabling their active participation in decision-making (World Bank, 2008; IAASTD, 2009; UK Food Group, 2010). Providing access to basic services and social protection, such as education, health, nutrition, social welfare and infrastructure, are also essential for farmer empowerment (WFP and FAO, 2009).

11. Promoting food sovereignty and the right to food

Global and national food security can be sustained only if local food security is assured, both in communities that produce food and in urban areas that depend on the former for their food supply. Food sovereignty – the right of sovereign States and communities to democratically determine their own agricultural and food policies – should begin at the local level with communities taking centre stage (IAASTD, 2009; Greenpeace, 2009; Utviklingsfondet, 2010; UK Food Group, 2010). Food sovereignty goes beyond food self-sufficiency; it incorporates agrarian reforms, local markets, biodiversity, autonomy from external pressures, cooperation and all aspects of local food production (IAASTD, 2009).

Governments and the international community need to respect and ensure the right of every person to adequate food as a fundamental component of sustainable solutions to food challenges (WFP and FAO, 2009; Utviklingsfondet, 2010). Respecting farmers’ rights to agricultural genetic resources is an essential component of promoting the right to food.

12. Supporting agro-ecological farming

The viability and benefits of agro-ecological farming systems have been well established in numerous studies. There is now a need to redirect research and investments at the national and international levels in order to increase productivity in an environmentally sustainable and socially equitable manner (Ho, 2008; Greenpeace, 2009; UK Food Group, 2010; Utviklingsfondet, 2010). National support programmes and agricultural education curricula need to be reshaped, and decision-makers, implementers and extension service providers reoriented towards respecting and supporting the central role of smallholder farmers and peasants in agricultural development through agro-ecological farming (IAASTD, 2009).

Commentary V: Soaring Oil and Food Prices Threaten Affordable Food Supply

Richard Heinberg,
Post Carbon Institute

Abstract

The current global food system is highly fuel- and transport-dependent. Fuels will almost certainly become less affordable in the near and medium term, making the current, highly fuel-dependent agricultural production system less secure and food less affordable. It is therefore necessary to promote food self-sufficiency and reduce the need for fuel inputs to the food system at all levels.

The connection between food and oil is systemic, and the prices of both food and fuel have risen and fallen more or less in tandem in recent years (figure 1). Modern agriculture uses oil products to fuel farm machinery, to transport other inputs to the farm, and to transport farm output to the ultimate consumer. Oil is often also used as input in agricultural chemicals. Oil price increases therefore put pressure on all these aspects of commercial food systems.

Thus there is concern that high and volatile prices of crude oil may cause food prices to continue to increase (Bloomberg, 2011).

Moreover, as oil prices rise, so does demand for biofuels, which are the only non-fossil liquid fuels able to replace petroleum products in existing combustion engines and motor vehicles. But biofuels are often made from corn and other agricultural products. As

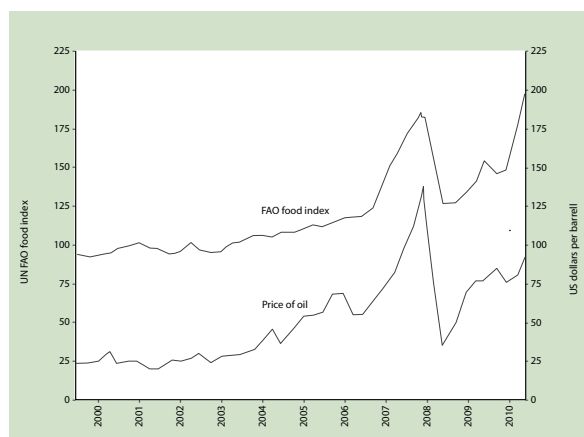
demand for these alternative fuels increases, crop prices are forced upwards, making food even less affordable.

Export-led agricultural strategies also increase the world's vulnerability to high oil prices. Most donor agencies have encouraged the less industrialized countries to focus on the production of cash crops at the expense of staples for local consumption. As a result, people in these countries are forced to rely increasingly on imports of often subsidized cereals or those funded by food aid programmes. However, rising transport costs contribute to rising prices of food imports, making them ever less affordable. Fuel costs represent as much as 50 to 60 per cent of total ship operating costs.⁴⁹ From early 2007 to mid-2008, as fuel prices soared, the cost of shipping food aid climbed by about \$50 per ton – a nearly 30 per cent increase, according to the United States Agency for International Development (Garber, 2008).

Meanwhile, many poor farmers who cannot afford machinery, fuels and commercial farm inputs find themselves at a disadvantage in the global food economy. Compounding this are agricultural policies in industrialized food-exporting countries that subsidize domestic producers and dump surpluses onto developing countries, thus adding to the economic disadvantages of the smallholder farmers in those countries. As a result, millions of those farmers are being driven out of business annually. At the same time, developing countries are giving increasing priority to production for export, despite a burgeoning landless, poor urban class (whose immediate ancestors were subsistence farmers) that is chronically malnourished and hungry.

Soaring food and fuel prices have a disproportionate

Figure 2: Evolution of food and fuel prices, 2000 to 2009



Sources: US Energy Information Administration and FAOstat.

impact on developing countries and on poor people in developed countries. Americans, who, on average, spend less than one tenth of their income on food, are able to absorb the higher food prices more easily than the world's poorest 2 billion people, who spend 50 to 70 per cent of their income on food.

Why are oil prices so high? Speculative investment in commodities plays a role, though there is a persuasive case to be made that oil prices would be rising even if oil futures speculation were entirely curtailed. The oil industry is changing, and rapidly. As Jeremy Gilbert, former chief petroleum engineer for BP, has put it, "The current fields we are chasing we've known about for a long time in many cases, but they were too complex, too fractured, too difficult to chase. Now our technology and understanding [are] better, which is a good thing, because these difficult fields are all that we have left" (Gilbert, 2011).

The trends in the oil industry are clear and undisputed: exploration and production are becoming more costly, and are giving rise to greater environmental risks, while competition for access to new prospective regions is generating increasing geopolitical tensions. According to the International Energy Agency (IEA, 2010a), the rate of world crude oil production reached its peak in 2006. The IMF has joined a chorus of energy industry analysts in concluding that scarcity and high prices are here to stay (IMF 2010 and 2011).

A collapse in demand for oil resulting from sharply declining global economic activity could cause oil prices to fall, as happened in late 2008. Indeed, this is fairly probable. But while it would make oil *cheaper*, it would not make fuel more *affordable* to most people. It is theoretically possible for the world to curb oil demand through policies that limit consumption, and it is also conceivable that some unexpected technological breakthrough could rapidly result in a cheap, effective alternative to petroleum. However, these latter two developments are rather improbable. Thus there is no likely scenario in which the services provided by oil will become more affordable within the context of a stable global economy at any time in the foreseeable future.

While wealthy consumers are able to absorb incremental increases in food prices, a sudden interruption in the availability of fuel (due to geopolitical events) or a significant gradual curtailment of fossil fuel production (due to the continuing depletion

of world hydrocarbon reserves) could lead to a breakdown of the food system at every level, from farmer to processor to distributor to retailer, and finally to consumer.

To summarize, high oil prices contribute to soaring food prices. Our modern global food system is highly oil-dependent, but petroleum is becoming less and less affordable. Extreme weather events also contribute to high food prices, and, to the extent that such events result from anthropogenic global warming, they are also ultimately fuel-related. Thus there is no solution to the world's worsening food crisis within current energy and agricultural systems.

What is needed is a major redesigning of both food and energy systems. The goal of managers of the global food system should be to reduce its dependence on fossil energy inputs while also reducing GHG emissions from land-use activities. Achieving this goal will require increasing local food self-sufficiency and promoting less fuel- and petrochemical-intensive methods of production.

Given the degree to which the modern food system has become dependent on fossil fuels, many proposals for delinking food and fossil fuels may seem radical. However, efforts to this end must be judged not by the degree to which they support the existing imperatives of the global food system, but by their ability to solve the fundamental challenge that faces us: the need to feed a global population of seven billion (and counting) with a diminishing supply of fuels available to fertilize, plough and irrigate fields, and to harvest and transport crops. Farmers need to reduce their dependence on fossil fuels in order to build resilience against future resource scarcity and price volatility.

In general, farmers can no longer assume that products derived from petroleum and natural gas (chiefly diesel, gasoline, synthetic fertilizers and synthetic pesticides) will remain affordable in the future, and they should therefore change their business plans accordingly. While many approaches could be explored, which in any case would depend on specific geographic locations, the necessary outlines of a general transition strategy are already clear, as discussed below.

- Farmers should move towards regenerative fertility systems that build humus and sequester carbon in soils, thus contributing to solving climate change rather than exacerbating it.
- Farmers should reduce their use of pesticides in favour of integrated pest management systems that

rely primarily on biological, cultural and physical controls.

- More of the renewable energy that will power farming activities can and must be generated on farms. Wind and biomass production, in particular, can provide farmers with added income while also powering farm operations.
- Countries and regions should take proactive steps to reduce the energy needed to transport food by reorganizing their food production systems. This will entail support for local producers and for local networks that bring producers and consumers closer together. More efficient modes of transportation, such as ships and trains, must replace less efficient modes, such as trucks and planes.
- The end of the fossil fuel era should also be reflected in changes in dietary and consumption patterns among the general population, with a preference for foods that are grown locally, that are in season and that undergo less processing. Also, a shift away from energy- and meat-intensive diets should be encouraged.
- With less fuel available to power agricultural machinery, the world will need many more farmers. But for farmers to succeed, current agricultural policies that favour larger-scale production and production for export will need to change in favour of support to small-scale subsistence farming, gardening and agricultural cooperatives. Such policies should be formulated and put in place both by international institutions, such as the FAO and the World Bank, and also by national and regional governments.

If such a transition is undertaken proactively and intelligently, there could be many additional benefits, with more employment in farming, more environmental protection, less soil erosion, a revitalization of rural

culture and significant improvements in public health. Some of this transformation will inevitably be driven by market forces, led by the rising price of fossil fuels. However, without planning, the transition may prove destructive, since market forces acting alone could bankrupt farmers while leaving consumers with few, if any, options for securing food supplies. Removing fossil fuels from the food system too quickly, before alternative systems are in place, would be catastrophic. Thus the transition process requires careful consideration and planning.

There are reasons for hope. A recent report on African agriculture by UNCTAD and UNEP (2008b) suggests that organic, small-scale farming can deliver the amount of increased yields thought to be possible only through industrial farming, and without the environmental and social damages caused by the latter. Recent research by Badgley et al. (2007) also concludes that organic and low-input methods can increase yields in developing countries while maintaining yields in industrialized countries.

Generally, smaller farms have greater biodiversity (Hole et al., 2005), place greater emphasis on soil-building (D'Souza and Ikerd, 1996) and display greater land-use efficiency than large farms (Rosset, 1999).

Nevertheless, despite these promising trends and findings, it is axiomatic that no food system tied to the earth's finite soil and water resources can support an ever-expanding and ever more resource-demanding population. The prudent path towards reforming the global food system must therefore coordinate agricultural policy with appropriate population, education, economic, transport and energy policies. The transition to a post-petroleum food system will need to be comprehensive. In its scale and required speed it promises to be one of the greatest challenges in human history. But the challenge will only grow the longer it is postponed.

Commentary VI: A Critical Analysis of Commodity and Food Price Speculation

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Abstract

There is an urgent need for policymakers to find ways of keeping financial investors out of commodity markets. Investment funds should be mobilized and encouraged to invest in production and research and development, rather than virtually or physically hoarding commodity stocks for merely speculative purposes, thus keeping them away from real economic activity. There is no economic justification for such siphoning away of production factors.

A. The extent of speculation

Until the turn of the century, there was very little speculation and financial investment in food; at best, very few specialized traders and financial analysts were active in this area. However, this has dramatically changed in recent years. During the period 2003–2008 alone, investment in the two biggest global commodity index funds shot up from \$13 to \$317 billion – a spectacular growth of 2,300 per cent.⁴⁸

Originally, commodity exchanges, at which for instance wheat futures contracts are traded, played a constructive role for “real” agriculture. Farmers were able to sell their production to the miller at the “future” price quoted on the commodity exchange well in advance of the harvesting date. In this way, both sides could better plan their business, because they knew at what price the product would be sold, and the farmers were no longer exposed to further price fluctuations. Thus commodity exchanges provided risk management, or rather risk reduction, services. Since about 1999, the international finance lobby persuaded regulators to relax or lift restrictions on commodity futures trading, which banks and investment fund managers viewed as a lucrative business. However, this eventually led to a perverse market situation. The fact that speculators at commodity exchanges only need to have a fraction of their contracts backed by proper (real) funds (the so-called margin) results in an artificial increase in investments through credit.

The Chicago Board of Trade (CBOT) Exchange Volume Report of May 2011, reported trading of some 2.6 million futures and options contracts in that month. With a single contract, about 136 tons of wheat (5,000 bushels at 27 kg) were traded, resulting in a total

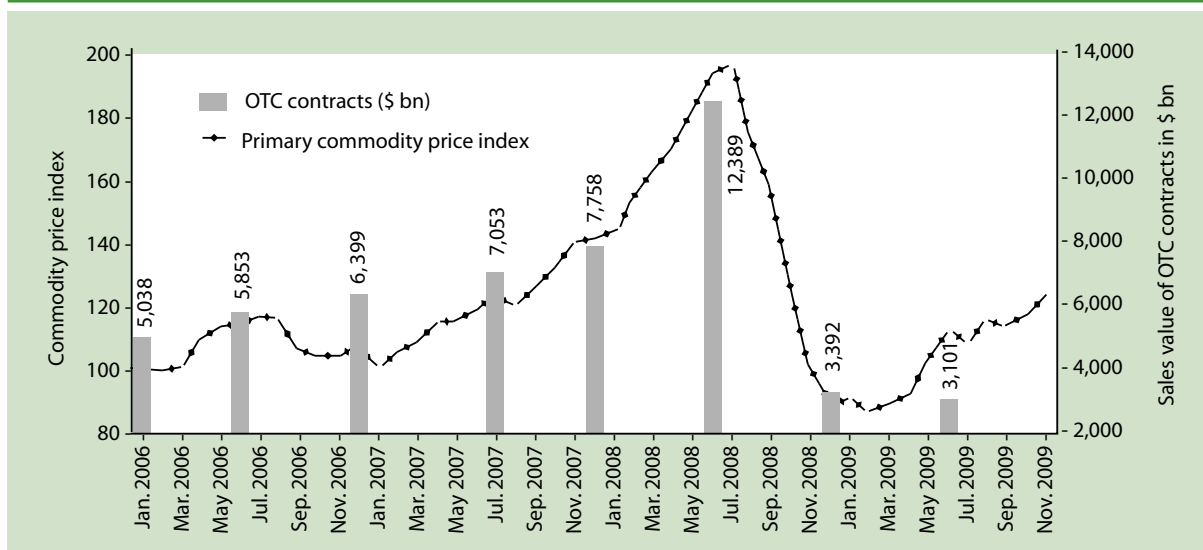
trading volume of 358 million tons of wheat (at a value of about \$90 billion), and that at just one commodity exchange in Chicago.⁴⁹ By way of comparison, this trading volume is equivalent to some 52 per cent of the total global wheat production of 2009.

Besides “formal” trading operations at commodity exchanges, many deals are made directly between financial market participants outside the official exchanges via telephone or via so-called “dark pools” (as over-the-counter (OTC) transactions). The supervisory authorities get very little information on the nature and volume of such deals. This is symptomatic and a contributory cause of the current financial crisis: since policymakers and regulators are not aware of the risk exposure and what consequences and domino effects the default of one market participant may have on the stability or fragility of the financial system, they do not have solid information on the basis of which to make informed and reasonable decisions. This also applies to the commodity trading market.

According to the Bank for International Settlements (BIS), the total volume of OTC transactions in 2010 amounted to \$601 trillion. This amount is equivalent to 10 times the size of the world’s GDP, estimated at around \$60 trillion that year. The largest share of OTC transactions concerned interest-related deals, but commodity transactions were estimated to amount to about \$3 trillion – almost the equivalent of Germany’s GDP.

B. Impact on commodity prices

Price volatility in certain commodity markets, including for some grains, has significantly increased, though it is very difficult to determine to what extent this is

Figure 3: Correlation between the number of OTC contracts and commodity price development, 2006–2009

Source: Ghosh, 2010.

due to the effect of escalating speculation on specific commodity prices. Whereas in the distant past prices varied only marginally, today a doubling of prices or a drop of 50 per cent or more is no longer a rare occurrence. This level of extreme volatility can hardly be explained by market fundamentals alone. A recent study by Lagi, Bar-Yam and Bertrand (2011) attributes food price volatility largely to speculation and, to a lesser extent, to the expansion of biofuel production.⁵⁰

An illustrative example of speculative activities can be seen in the history of oil prices, specifically of West Texas Intermediate (WTI), over the past five years (figure 4). From the level of \$60 per barrel at the end of 2006, the price shot up to over \$140 per barrel (i.e. by some 140 per cent), only to fall sharply shortly thereafter by over 70 per cent, to some \$40 per barrel. Without doubt, the economic crisis of 2008–2009 dampened oil demand, but unlikely by as much as 70 per cent. Likewise, it is highly unlikely that demand in the two preceding years rose by 140 per cent. And there was no shortage of supply that might have justified such an aberration.

During the long phase of rising commodity prices, mostly from 2003 onwards, many arguments were advanced to explain the increase, including rising demand in rapidly industrializing countries and the political insecurity in several producing regions such as Iraq. Although the global economic crisis in 2008–2009 dampened oil demand, the fundamental factors persisted, so that it is unlikely that those factors caused oil prices to ease by as much as 70 per cent. Rather,

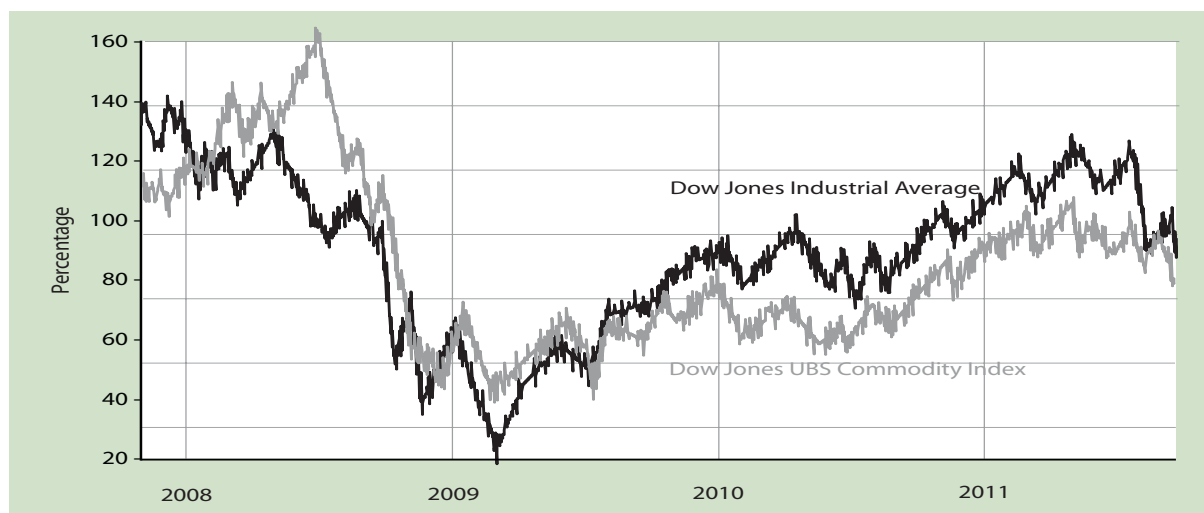
it was the considerable speculation in the market that drove those prices; this applied both to their upward and downward movements.

In the course of the second half of 2008, numerous speculators were hard hit by the dramatic developments in the world's financial markets and the resulting loss in the face value of bonds and shares. Speculators were obliged to liquidate loans for which they no longer had sufficient cover. As a result, any positions on the major players' books that still had any value and could be sold easily to generate liquidity in a crashing environment, including a significant volume of forward contracts on commodities, were sold, which led to a considerable easing of commodity prices. Other actors who also had small collateral on forward contracts got into trouble because falling

Figure 4: Development of the price of oil (WTI), 2007–2011

Source: <http://www.finanzen.net>.

Figure 5: Correlation between share and commodity prices (Dow Jones Industrial Average versus Dow Jones UBS Commodity Index), Sept. 2007–Sept. 2011



Source: <http://www.tradesignalonline.de>.

corn prices had eaten into their collateral. They too had to sell their positions in order to meet their payment obligations. This avalanche of selling continued and caused a massive price decline, dropping below the level of departure before the price rise even though all “market fundamentals” that should have driven prices up still persisted. Neither producers nor consumers of commodities can adjust their level of production and consumption to such extreme and quick price movements. The erratic price behaviour therefore becomes a serious problem.

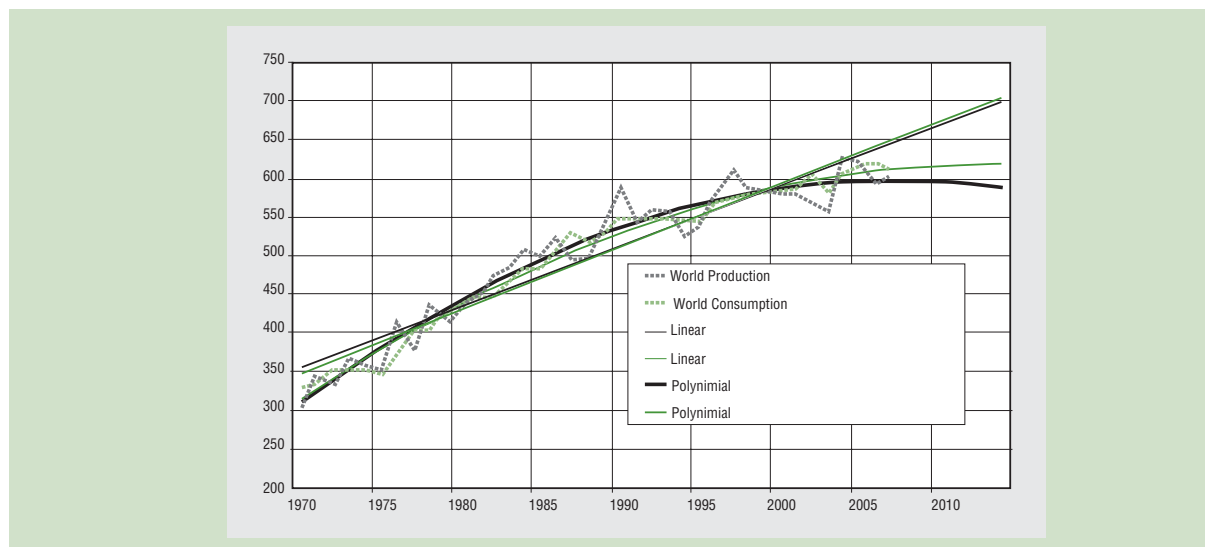
Apart from higher price volatility, an unusually high correlation (see figure 5) has also recently been observed in the price movements of apparently economically separate markets, such as for shares and commodities. In theory, that should make little sense, as their rationales and fundamentals are very different. Indeed, high commodity prices should dampen profit expectations of companies. The reason for this correlation is that, until a few years ago, commodity market developments were chiefly a function of physical supply and demand, and had little to do with developments in the financial markets. However, the increasing standardization and simplification of commodity exchange trading led to financial investors becoming increasingly attracted to alternative forms of investment that did not follow the trend of conventional financial markets, so as to spread their risk. Paradoxically, this run on commodity exchange contracts ultimately led to a neutralization of the very benefit they offered. At the

same time, developments on commodity markets have converged with those on international financial markets, contrary to what should occur, given that it is market fundamentals, such as harvest volume or extreme weather events, that normally should have the major impact on commodity prices.

C. The role of speculators

The above analysis shows that supply and demand between producers and consumers are no longer the exclusive determinants of commodity prices; the driving forces and interests of financial markets are also increasingly influencing those prices. This makes commodity prices dependent on international monetary policy and the capital stock situation of large banks. Such a development is highly problematic, because every local financial crisis can easily trigger a global economic one, as witnessed over the past three years.

For the majority of financial actors, whether they are banks or investment funds, the overriding interest is to make money from commodity price volatility, and not the acquisition of real goods. They buy forward contracts on the delivery of commodities in the future at an already predetermined price. Shortly before such contracts become due, they conclude other contracts to even out their financial positions without having ever moved a kilogram of metal or a bushel of grain. If their bet turns out to be successful, they make some money; otherwise they incur a loss. It is estimated that

Figure 6: Evolution of production and consumption of wheat (1,000 tons)

Source: United States Department of Agriculture, *Production, Supply and Distribution database*, 2008 (<http://www.fas.usda.gov/psdonline/>).

currently only about 2 per cent of futures contracts lead to a real physical delivery of commodities; the rest are liquidated before delivery. Yet, contrary to what would be assumed, this liquidation does not trigger a price decline, because the resulting freed investment capital is immediately reinvested in new contracts – the so-called “rollover” of contracts.

Capital invested in this way tends to stay in commodity futures markets in the medium term, which leads to price bubbles that in turn attract more speculative investment. This is what happened in the period 2003–2008 and again in the subsequent two years. If the market thus attracts more and more money via commodity index funds or similar vehicles, this accelerates price developments. Thus the increasing participation of financial investors in commodity markets for speculative purposes drives up futures prices and index funds, just as with shares on the stock exchange, because for each buyer there exists a seller.

The investment funds manager also sells commodity investments if the price persistently declines (or if investors pull their money out of the funds), and thus reinforces the declining price trend. No investor, speculator or fund manager buys an agricultural commodity at times of bumper harvests or low demand; rather, they are attracted by harvest failures and extreme demand situations. This is why both speculators and financial investors reinforce erratic price fluctuations. Their role in price formation for

food must therefore be viewed with considerable scepticism and concern.

In the case of wheat, the economic data provide a rather solid picture – production has always kept pace with demand (figure 6). It is therefore paradoxical that in recent years the price of wheat has been very volatile.

Since early 2009, large financial investors have invested in commodities by acquiring the stocks of entire warehouses, and since these are acquired directly from the producers, they do not feature in the real economy. This provokes production shortages and price booms with the simple objective of profit maximization by the international financial sector, which is detrimental to the real economy and to society at large.

There is no real need for the agro-food industry or the economy to give financial investors virtual or physical bags of wheat or other scarce commodities for diversifying their financial portfolio and thus creating artificial demand. The world market for food and other commodities is already under heavy demand pressure, which the food and commodity sector has managed to keep in check by expanding production. However, if there is additional and unnecessary demand pressure from financial investors, this fragile market equilibrium will be jeopardized.

Commentary VII: Let the Good Products Grow and Flow

Sophia Twarog
UNCTAD secretariat

Abstract

Reducing technical barriers to trade in organic agricultural products through harmonization and equivalency of organic standards and conformity assessment systems is of major importance for increasing organic markets, boosting trade in organic products and reducing transaction costs. This would promote the much-needed global shift towards sustainable and ecological food and agricultural systems.

The drive for high productivity and profitability through agro-industrial models has created serious environmental and social problems. Thus business as usual is not an option. The world needs to undergo a fundamental shift towards sustainable and ecological agricultural and food systems. This has been highlighted by an increasing number of United Nations studies, including a report by the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD, 2008), many UNCTAD reports (including its *Trade and Environment Review 2006*⁵¹ and 2010), UNEP's *Green Economy Report* (UNEP, 2011), and reports by the High Level Panel of Experts on Food Security and Nutrition (HLPE, 2011), and the United Nations Special Rapporteur on the Right to Food (Human Rights Council, 2010).

Within the broad scope of environmentally friendly agriculture, organic agriculture plays a very important role,⁵² being, in many ways, the gold standard leading the way. It is also clearly defined and therefore verifiable. There are standards for organic production and processing which can be used both to guide operators and to assess if a system is organic or not. Such clarity enables producers to claim with sufficient backing that their products are organic, and to be economically rewarded for their sustainable production practices, since organic products can generally be sold at higher prices and are in high demand.

Organic guarantee systems (OGSs) are set up to guarantee to consumers that products have been produced in accordance with organic principles and practices. The main components of an OGS are:

- A production and processing standard, and
- A conformity assessment system to ensure that the standard is being followed.

There are different options for conformity assessment. Self-claim, relationships based on personal trust, participatory guarantee systems⁵³ and third-party certification can all work well at local and national levels. For exchanges across distances (including regional or international trade), usually third-party certification is needed. In countries that regulate their markets and certification systems, there is generally an additional layer, that of accreditation, supervision or approval of certification bodies. The organic private sector system also offers this additional layer of global organic guarantee through the International Organic Accreditation Service.

In recent decades, there has been a proliferation of public and private OGSs worldwide. Often these systems are islands: products sold as organic must comply 100 per cent with all the details of any particular system, and each OGS has usually been set up with local or national circumstances in mind. Little thought has been given to the benefits of the flow of products across systems, particularly inward flows. Small details or differences in OGS – at the levels of standards, certification or accreditation/ approval – can become big barriers to trade. This lack of harmonization and equivalency across systems is a major hindrance to the development of the organic sector.

This comes at a high price. Farmers struggle to demonstrate that they meet all the rules and requirements in all the different markets where they wish to sell, which could even be two different stores on the same street. Similarly, processors and traders struggle to source acceptably certified final products and ingredients for processed products. And certification bodies pay high costs for multiple accreditations. Moreover, dealing with OGS diverts

resources from more core activities such as production. At the same time, consumers pay higher prices and have fewer organic products to choose from. Finally, as growth in organic agriculture is hindered in these ways, the environment becomes more degraded due to the spread of non-organic, environmentally damaging forms of agriculture.

A. Importance of organic trade

The world needs strong, vibrant local food systems with local markets and local relationships. These should be actively supported by local consumers, retailers and governments alike. There is a whole array of actions that need to be undertaken, including development of local and regional infrastructure such as roads and markets, provision of missing services such as credit to smallholder farmers, support for the conservation and exchange of local seeds, breeds and related traditional knowledge, participatory research in partnership with local operators and in response to local needs, extension services to support organic production, and support to smallholder farmers to organize into groups (UNCTAD-UNEP, 2008a).

Trade in organic products can also play an important complementary role. Organic products currently account for a very small share of overall sales of food and agricultural products. There is great potential for this share to increase. Over the past few decades, the biggest constraint on growth in organic sales has been the shortage of a consistent supply.

Most operators and governments readily welcome opportunities to export organic produce as it provides sources of income and ways to stimulate domestic production. However, what is often overlooked is the important role that imports (e.g. of fresh produce, processed products or ingredients for processing) can play in expanding domestic organic markets. The larger the range of organic products on offer, the greater is consumer interest. As the markets grow, the high transaction costs and logistical inefficiencies are reduced as quantities increase, knowledge and experience are gained, short and long supply chains are developed and maintained, and trust is built along the supply chain through stable relationships. In general, the overall benefits from increasing the size of the organic market by attracting new organic consumers will outweigh the possible disadvantages some domestic producers fear in terms of competition in their home markets.⁵⁴ Since consumers of organic

products will still generally prefer local products, domestic organic operators can benefit from this by marketing their products as

- national, through a national label such as the national flag, and/or
- local, through direct sales or by signs on local products at point of final sale.

These local or national labels may even attract new consumers of organic, who are interested in buying local products. In addition, ingredients for processed products often have to be sourced from many different countries, which means that imports are necessary for developing the organic processed products industry, which is one of the most rapidly growing segments of the organic market.

Openness to trade in organic products also shows solidarity with the rest of the organic world, especially with organic producers from developing countries. In most of these countries, the domestic organic markets are particularly small. Therefore, organic exports can be an important pull factor for the development of sustainable agricultural practices and improved livelihoods for the world's poor. On smallholder farms in developing countries, often one or two products are exported, but dozens of other products are being produced in an organic manner and sold locally. This improves food security (UNCTAD-UNEP, 2008b) and the health of local populations.

In general, organic trade acts as an important stimulus to organic production and sales. However, its potential is limited by technical barriers to trade due to differences in OGSs. Consequently, it produces the odd situation that conventional products can cross borders more easily than organic products. This only serves to exacerbate another more fundamental tilt against organic products in the market's playing field. At present, apart from fair-trade products, organic products are the only goods that have internalized some environmental costs in their prices. In contrast, the considerable damage to the environment, health and other economic sectors caused by agro-industrial agriculture is not at all reflected in the prices of conventional food and agricultural products. These costs to society and to the planet are very high, but are paid by society in terms of higher health costs, environmental clean-up, and job losses in fisheries that are affected by agrochemical run-off, to cite a few costs. For example, the first ever pan-European Nitrogen Assessment performed a cost-benefit analysis of nitrogen fertilizer use in Europe, which revealed

that the overall environmental costs “(estimated at €70–€320 billion per year at current rates) outweigh the direct economic benefits of reactive nitrogen in agriculture. The highest societal costs are associated with loss of air quality and water quality, linked to impacts on ecosystems and especially on human health” (Sutton et al., 2011). However, these costs are not reflected in the prices of the food and agricultural products produced with heavy inputs of the synthetic nitrogen fertilizers. The long-term solution to this problem clearly should be to change the underlying incentive structures so that negative externalities are duly reflected in the prices of all agricultural products. At the very least, governments should stop subsidizing these harmful inputs. This could ultimately result in organic production becoming the norm, with OGSs no longer needed. In the meantime, however, it is important to reduce the technical barriers to trade caused by differences in OGSs so that the organic agriculture sector can grow. The main tools for this are harmonization and equivalence.

B. Facilitating organic trade through harmonization and equivalence

Equivalency should be the basis for international trade in organic products, supplemented by harmonization where desired and applicable. National organic standards and regulations should be in line with international organic standards and also, very importantly, take into account national agroecological, socio-economic and cultural perspectives. International trade should be based on mutual respect for this policy space.

Countries and private sector standard setters should not force the rest of the world to comply in a prescriptive manner with every single detailed specification in their OGSs, which might not fit well in the others' contexts. Rather, the way forward is to expect the best while at the same time embracing diversity. Countries and private OGSs should allow imports of organic products that are produced and guaranteed in a manner equivalent (not identical) to their own.

For over a decade, UNCTAD, FAO and the International Federation of Organic Agriculture Movements (IFOAM), through their joint International Task Force on Harmonization and Equivalence in Organic Agriculture (2002–2008), have worked together, along with a host of key public and private sector actors, to

develop the following tools to foster trade based on equivalency:

- For conformity assessment, the International Requirements for Conformity Assessment Bodies (IROCB) are performance requirements for organic certifiers adapted from ISO 65, which facilitate recognition across systems.
- For production and processing standards, the Equitool is a guide to assessing differing standards in a structured and transparent manner.

Under a successor joint initiative, the Global Organic Market Access (GOMA) project, the Equitool has been enhanced through the development of the Common Objectives and Requirements for Organic Systems (COROS). COROS helps governments and other organic standard setters to identify the underlying objectives their organic production and processing systems aim to achieve, and then to evaluate other standards to see if, on the whole, they achieve those objectives (in a similar or different but equally valid manner). IFOAM, the international private sector standard setting body, is using COROS to develop the IFOAM family of standards – those which have been assessed and found to be overall equivalent to COROS.

The public and private sectors should make full use of these tools. Specifically, for the purpose of trade in organic products, and particularly as regards imports of organic products from other systems, public and private sector actors involved in regulating organic guarantee systems should:

1. For production and processing standards,

- Use COROS and the Equitool to evaluate other production and processing standards to determine if compliance with those standards would, as a whole, achieve the most important underlying objectives of organic production systems.

2. For conformity assessment systems,

- Build trust among accreditors and supervising bodies (including governments) to mutually recognize accreditation/approval systems of certification bodies and other means of conformity assessment.
- Use IROCB to evaluate the performance requirements for certification bodies.

The landscape of international trade in organic products is currently changing. Many regions are undergoing regional harmonization of parts or all

of their OGSs. For many years, the EU had the only harmonized system, although the development of the National Organic Program in the United States could also be considered a sort of internal harmonization of a web of private and State OGSs. Since 2005, with the support of IFOAM, FAO, UNCTAD and UNEP, various developing-country regions have also engaged in regional cooperation and harmonization.

- In East Africa, the East African Organic Products Standard (EAOPS) was developed through a regional public-private sector consultative process in 2005–2007, and adopted as the East African Community standard in 2007.
- The Pacific Islands followed this model to develop their own regional standard, which they adopted in 2008.
- The Central American countries plus the Dominican Republic are currently finalizing full harmonization of their organic regulations relating to standards plus conformity assessment aspects.
- Public and private sector actors from South, East and South-East Asian countries have been cooperating since 2010 to develop the Asian Regional Organic Standard (AROS), the draft of which was finalized in February 2012.

These efforts at harmonization can both expand the regional markets and develop a sense of common regional identity, with positive spillover effects in terms of South-South cooperation in a number of areas.

Regulations concerning organic imports need to be updated to reflect this shifting landscape and allow for recognition of regional organic standards. This

would involve separating equivalency determinations of standards and of conformity assessment systems. Currently this is not the case. For example, under the EU import approval system there is no avenue for the East African Community to submit the EAOPS for approval because a common organic conformity assessment system comprising accreditors and supervision of certification has not yet been developed. Thus the region does not fit into the category of a third-country list.

For regulations that maintain lists of approved certification bodies (such as in the EU and the United States), certification bodies should be allowed to certify to different standards in different regions. For example, a European certification body operating in Europe and in East Africa should be able to use the EU standard for operators in Europe and the East African Organic Products Standard for operators in East Africa.

C. A landmark in facilitating organic trade

In 2008, Canada and the United States signed an equivalency agreement with full system recognition, including for imports. Certification bodies around the world need only obtain one accreditation and operators only one certification to access both markets. This equivalency agreement thus promotes organic trade creation without trade diversion, which may occur under more exclusionary agreements. It thus shares the benefits with the rest of the world. It is a best practice to be emulated, and hopefully also replicated multilaterally worldwide.

Commentary VIII: Community-Supported Organic Production: The Case of the Regional Value-added Citizen Shareholder Corporation in Southern Germany

Christian Hiss
Regional Value-added Citizen Shareholder Corporation

Abstract

The Regional Value-added Citizen Shareholder Corporation supports:

- The creation and sustainable operation of small and medium-sized enterprises in the local production, processing and marketing of organic food through a dedicated investment strategy that assures the economic independence of enterprises through shareholder participation of interested citizens and consumers of the region and collaboration in existing clusters.
- The gathering and evaluation of data on non-monetary benefits or services generated by supported farmers and enterprises on the basis of 64 social, economic and ecological indicators.

The Regional Value-added Citizen Shareholder Corporation (RVACSC) in the region of Freiburg in southern Germany is an innovative enterprise in the area of social-ecological investment. It aims at acquiring agricultural enterprises in the region of Freiburg with cash investments from local consumers and citizens, who take an active interest in the sustainable development of organic agriculture and the provision of safe and good quality food from the region. The funds raised are used by RVACSC to acquire or participate in production facilities that are then leased to interested RVACSC member farmers or entrepreneurs according to criteria set by the RVACSC.

Acquisitions concern the production, processing and distribution of organic produce, including seeds, farms, energy generation, fertilizer production, restaurants and hotels, as well as retail outlets. As a citizen corporation, it aims to attract private and institutional investors, who provide small and medium-sized enterprises with a solid capital base aimed at building and consolidating sound, regionally-focused economic structures.

A. Assuring sustainable management and appropriate return on investment

The pressure of securing sufficient capital returns has a major bearing on agricultural production, and therefore on the lives of farmers and agricultural

producers. Specialization, mechanization and economies of scale tend to become the lynchpin, even for organic production at enterprise level.

However, the orientation of agriculture based only on return-driven criteria implies losses on the socio-ecological side, because manpower is replaced by technology or low-income, seasonal labour. This changes the cultural landscape. A further consequence of this development is that technically disadvantaged regions become more marginalized over time. The same applies to sectors that are less lucrative, such as dairy farming, small-scale agriculture in general, or breeding of new, regionally cultivated plant varieties. From an agricultural point of view, it makes more sense to have an interconnected and multifunctional management approach.

Yet in order to survive competitive market pressure, a significant share of the costs of conventional agricultural producers becomes externalized. Against this background, the prevailing capital return concept needs to be called into question. One therefore wonders whether the creation of specific socio-ecological values does not also represent a kind of “net yield”.

RVACSC shareholders obtain two types of returns on the capital they invest: a monetary and a qualitative one. The organization’s annual business report, in addition to providing information on the net monetary yield of its investments, also takes into account the

Table 6: Key sustainable management criteria

Staffing	Ecological criteria	Economic variables
Structure of employment	Soil fertility	Distribution of value creation
Level of wages	Biodiversity	Value creation for the region
Fluctuation	Development of organic cultivation area	Regional engagement
Quality of job functions	Resource consumption	Dialogue within the value-creation chain
	Implementation of EU Directive on Organic Agriculture	

social and ecological effects of RVACSC activities by providing information on the creation of value other than only material value. The fact that every economic process has a positive and negative impact on value creation for the economy is beyond doubt. Therefore, for each RVACSC share, both the micro- and macro-economic revenues are reported. The categories of sustainable management include the variables in Table 6.

B. New opportunities through regional networks

Through the engagement of the RVACSC in areas beyond only agricultural production, less lucrative operations and entities can be supported or strengthened. Likewise, cross-linking enables the RVACSC to channel capital from urban centres into rural areas.

C. Farm succession

For years, the number of people taking over their family farms has been constantly declining. On the other hand, there are many well-trained farmers and gardeners who cannot acquire their own farms due to the high capital requirements. With the instruments and intermediation provided by the RVACSC, a farm can be acquired by an interested farmer if there is

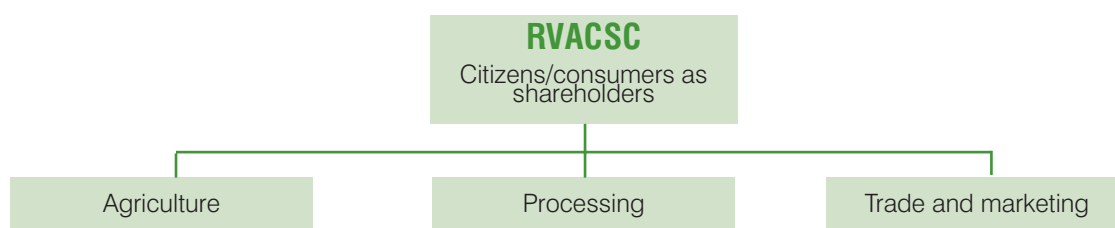
no family successor interested in running it, thus facilitating continuity of production and the robustness of the regional network.

D. Community and consumer participation and dialogue

The term “citizen shareholder corporation” was intentionally used for RVACSC. It denotes that, with the acquisition of shares, interested citizens and consumers from the region around the city of Freiburg become partial owners of the land and assets of RVACSC. They take an active interest in the sustainable management of the network, the management of the soil and conservation of the environment as well as in improving rural livelihoods. The principles of the RVACSC envisage a permanent dialogue between the shareholders and the operators/tenants of the individual entities on the most desirable direction of their activities and related production methods.

E. Regional versus global market orientation

The business model of RVACSC has a clear regional focus. Value creation remains within the region, and capital is sought from citizens within the region who take an active interest in sustainable agriculture, its

Figure 7: The conceptual structure of RVACSC

multi-functionality – including the conservation of local biodiversity and the environment – and the creation of rural livelihoods. This model offers a number of economic, environmental and social benefits.

1. Economic benefits:

- No one-sided specialization of production: the networking and consultative approach as well as the principals of organic agriculture prevent lopsided specialization;
- Less pressure to reduce costs and increase the scale of production;
- Priority given to quality over economies of scale through active support to smallholder farmers and small-scale processing and marketing companies;
- Mutual support within the network through counselling and support of partner companies;
- No dependence on specific marketing systems

and marketing partners;

- Maintaining managerial sovereignty through shareholder involvement, as there is no dependence on external financial agencies;
- Contribution to rural development and sustainable livelihoods through the creation of new companies and farms; and
- Mobilization of capital from within the region.

2. Environmental benefits:

- Short transport distances;
- Small producing units that respect the multi-functionality of agriculture;
- Promotion of organic agriculture and sustainable processing and marketing methods (with resulting improvements in soil fertility and biodiversity, and contribution to climate change mitigation); and
- Direct contribution of consumers to transforming

Table 7: Overview of key investments of RVACSC

Project	Nature of investment	Invested capital (€)
Dairy farm, Groos	Purchase and lease	297,628
Market garden, Feldmann	Purchase and lease	106,294
Real estate investments	Purchase and lease	116,449
Crop area: 7,94 ha	Purchase and lease	228,500
Natural food wholesale company, Bodan Ltd.	Silent partner	20,000
Food retail outlet, Rieselfeld Ltd.H	Shareholder	10,000
Organic-Catering, Mocellin	Silent partner	15,000
Fruit garden, Joel Siegel	Silent partner	45,000
RVACSC Delivery Service Ltd., Biohöfe Frischekiste	Shareholder	15,000
RVACSC Delivery Service Ltd., Biohöfe Frischekiste	Loan	25,000
RVACSC Real Estate	Shareholder	76,000
RVACSC organic market outlet, BioMarkt GmbH Breisach	Shareholder	35,000
RVACSC Real Estate	Loan	70,000
Invested capital		1,059,871
Approved investment projects		
Agricultural machinery	Purchase	35,000
Construction of farm house	Loan	270,000
RVACSC Delivery Service Ltd., Biohöfe Frischekiste	Increase of shares	15,000
RVACSC Delivery Service Ltd., Biohöfe Frischekiste	Loan	20,000
Total:		340,000
Planned projects		
Processing facility for dried fruit and vegetables	Purchase of suitable building	180,000
Market garden in Donaueschingen (new enterprise)	Partial ownership	60,000
Increasing the number of outlets for RVACSC organic market outlet Biomarket in the city of Freiburg and in adjacent areas	Increase of shareholding	280,000
Fruit garden (creation of new enterprise)	Partial ownership	50,000
Organic chicken farm (creation of new enterprise)	Partial ownership	80,000
Vegetable processing facility (creation of new enterprise)	Partial ownership	35,000
Cash reserve for land acquisition		100,000
Required capital		785,000

agricultural practices to more environmentally friendly ones.

3. Social benefits:

- Better working and social conditions;
- Greater recognition of the farming profession;
- Increased attractiveness of agriculture for young people and the local community; and
- Assistance to young people for creating agribusinesses.

F. RVACSC governance bodies and current capital

An RVACSC share currently costs €500, and takes the form of a registered share with restricted transferability, so that it cannot be sold without the explicit consent of the other shareholders. Currently, the RVACSC has 470 shareholders and a capital stock of €1.7 million. The current capital is invested in the farms and enterprises as shown in Table 7.

Commentary IX: The SEKEM Initiative: A Corner Pillar for the Community

Helmy Abouleish and
Matthias Keitel, SEKEM

Abstract

The great challenges confronting our world today – food insecurity, climate change and poverty – are long-term problems, mainly caused by unsustainable economic practices. These common economic practices have to be transformed into sustainable ones, preferably in a holistic way. The SEKEM⁵⁵ Initiative has adopted this approach since its inception in 1977. Its holistic business model not only follows economic principles, but also attempts to integrate ecological, societal and cultural dimensions. It thereby meets market demands and complies with standard economic procedures, protects the environment and promotes climate change adaptation and mitigation, guarantees ethical standards and human rights, and promotes the human development of its employees, suppliers and the surrounding communities.

31 October 2011 – this date will go down in history as the day when the world population exceeded 7 billion people. One major concern revolving around this landmark is how to provide enough food for the world's growing population when already around one billion people worldwide are suffering from hunger. In addition, climate change threatens hundreds of thousands of farmers with unpredictable weather events and shifts in seasons, which in turn exacerbate food insecurity.

Egypt reflects this global picture: its population is growing by around 2 per cent annually, while the Nile Delta, the most fertile and therefore the most important land strip for Egypt's domestic agricultural production, is threatened by rising sea levels. Already today, salinization of groundwater constitutes a problem that will most likely worsen in the future.

Business-as-usual approaches struggle to deliver solutions, while climate change is worsening and a billion people still suffer from hunger. At the same time, big agribusiness corporations increase their profits through questionable approaches, such as the use of genetically modified seeds or vast monoculture fields.⁵⁶ The success of SEKEM shows that ecological farming can adapt better to climate change and has the potential to feed the world if it is adopted widely over the next years.⁵⁷

Despite their shortcomings, businesses are crucial to tackling the issues related to food insecurity and

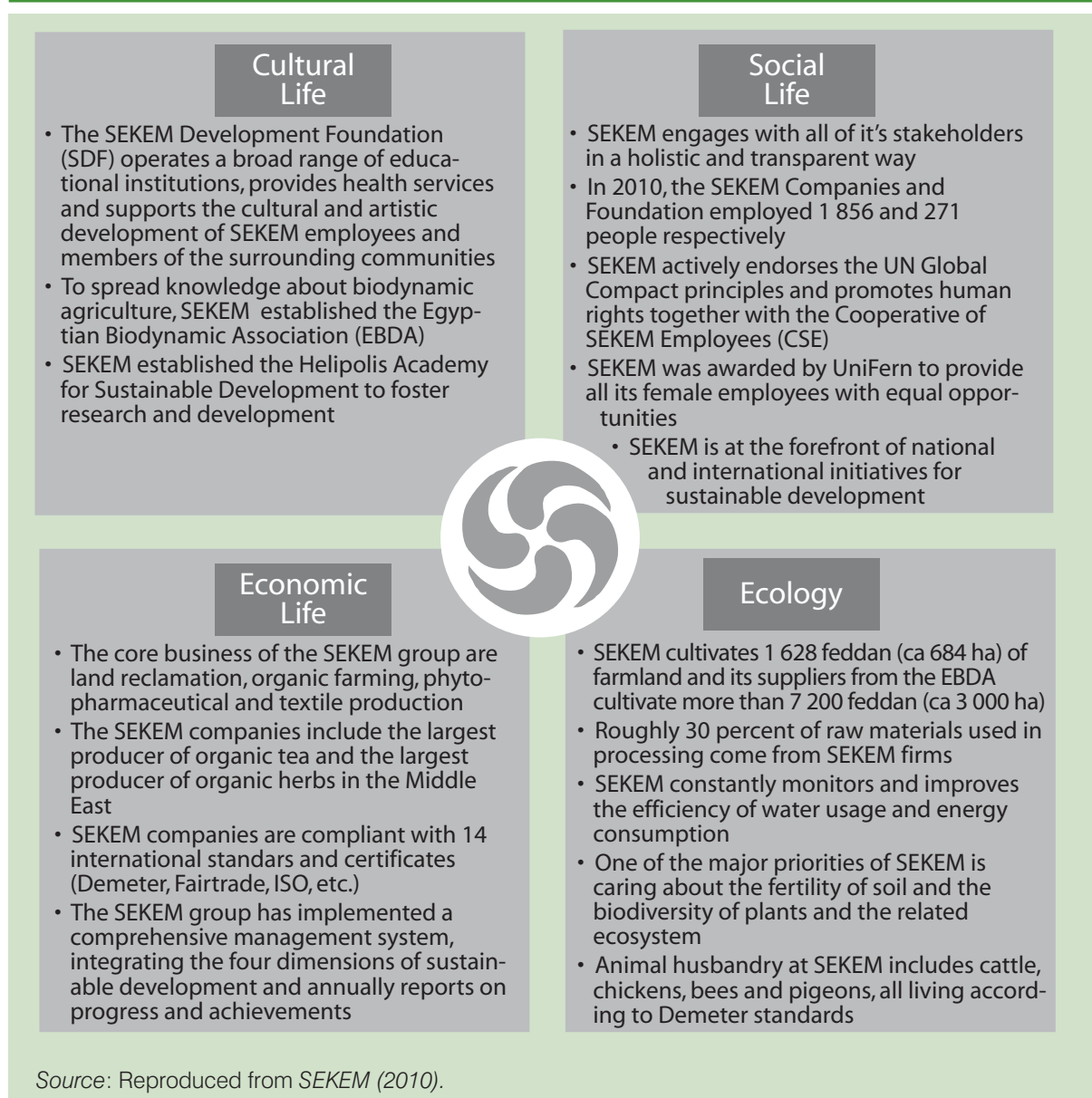
climate change. However, to be effective, those businesses need to ensure that the surrounding communities, which are usually their suppliers, participate in tackling the challenges and benefit from the businesses. Only if these people are included in the process and benefit from the businesses can sustainable solutions for food security and climate change be found.

The SEKEM Initiative follows such a community-based approach. SEKEM was founded with the idea of promoting sustainable development benefiting the local community and the environment in the surrounding villages.

A. Vision and mission of SEKEM

The SEKEM Initiative was established by Dr. Ibrahim Abouleish over 34 years ago about 60 km north-east of Cairo in rural Egypt. On returning to Egypt after 21 years of study and work in Austria, he noticed how Egypt's socio-economic fabric had deteriorated. His response to this was to develop the following vision for his country:

“Sustainable development towards a future where every human being can unfold his or her individual potential; where mankind is living together in social forms reflecting human dignity; and where all economic activity is conducted in accordance with ecological and ethical principles.”

Figure 8: SEKEM's activities based on its vision for Egypt

This vision integrates ecology with economic, societal and cultural life and is the guiding principle of all SEKEM activities as shown in figure 8.

B. Implementing SEKEM's vision

1. Establishing biodynamic agriculture as a competitive solution to the environmental, social and food security challenges of the twenty-first century

SEKEM's business model is based on the concept of "biodynamic agriculture", a specific form of organic

agriculture that views the farm as "a self-contained, self-sustaining ecosystem responsible for creating and maintaining its individual health and vitality without any external or unnatural additions. [...] Soil, plants, animals and humans together create this image of a holistic living organism".⁵⁸

With this form of agriculture, yields in traditional farming systems in developing countries and in regions where soils are degraded can be increased by up to 180 per cent (Scialabba, 2007). In Egypt, where desert land on which SEKEM started its operations is the most degraded form of soil possible, SEKEM has

significantly contributed to the availability of healthy and affordable food through this form of organic agriculture. Indeed, it is a pioneer in biodynamic agriculture in the MENA (Middle East and North Africa) region, and in establishing the organic market in Egypt.

Today, the organization and its biodynamic suppliers own over 20,000 acres of farmland of which 9,000 acres are cultivated. To spread knowledge about biodynamic agriculture, SEKEM actively supports the Egyptian Biodynamic Association (EBDA) which offers training on the application of biodynamic methods. Currently there are about 200 farms under the EBDA. About 1 per cent of the overall agricultural land in Egypt has been converted to organic agriculture.

2. Supporting individual development through holistic education and medical care

To promote human development, the SEKEM Development Foundation (SDF) was founded in 1983 under its previous name, Association for Cultural Development in Egypt. It supports and operates a broad range of educational, social and cultural institutions. There is a kindergarten, various programmes for socially disadvantaged children, schools and a vocational training centre, which together educate about 600 children and students. The SDF provides health services through a medical centre which serves 30,000 people in surrounding villages. It also supports cultural and artistic development. All of these programmes create jobs, provide better learning opportunities and health care for the people in the surrounding villages, and enable the societal inclusion of children with special needs, thus contributing to the alleviation of poverty, fighting social exclusion and improving literacy. It also ensures the integration of SEKEM within the wider social community of the region, and thereby contributes to cultural understanding between the local population and the SEKEM staff who might have a different background.

3. Creating workplaces that respect human dignity and support employee development

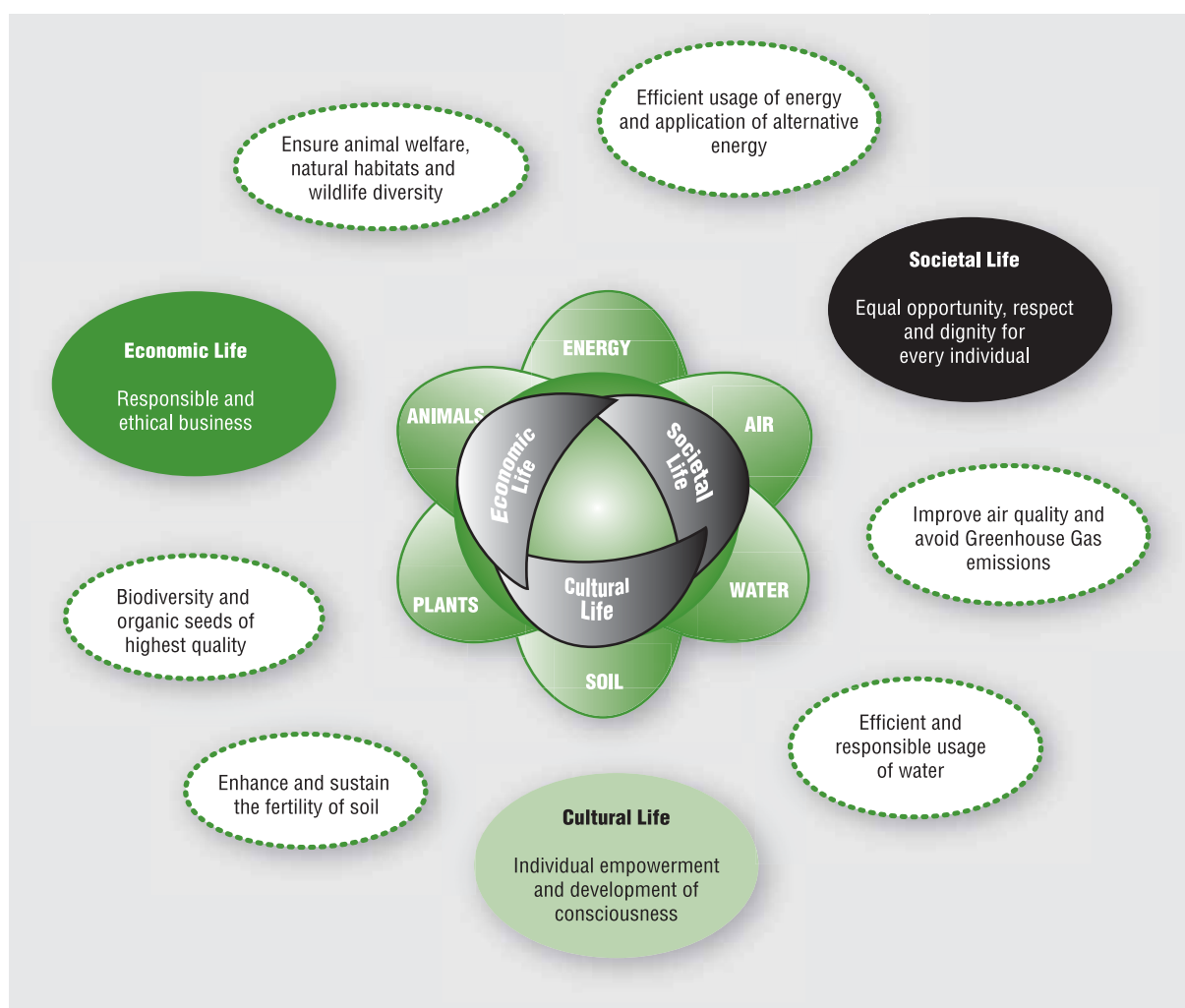
The SEKEM Group consists of eight companies: two of them process the raw materials grown on its fields (Libra and SEKEM for Land Reclamation), while Lotus processes herbs and spices, ISIS produces high-quality organic foodstuffs, NatureTEX manufactures textiles and ATOS Pharma manufactures phyto-

pharmaceuticals. These products are distributed and sold on the domestic (70 per cent) and international markets (30 per cent). The eighth company is El Mizan which offers grafting and plant cultivation services for fruit and vegetable growers.

The SEKEM Group of companies therefore forms an integrated value chain as all companies are closely interlinked. In 2010, these companies employed over 1,800 people, mostly hired from among the surrounding local communities. They offer health insurance and pension schemes – which promote social security – and equal opportunities through training, particularly to advance the professional equality of women in the workplace, promoted through the project “One Business Community... equal opportunity”, which was started in 2009. The Code of Conduct of SEKEM is based on its vision for sustainable development, which is depicted through the Sustainability Flower (figure 8) and further refined using the principles of the United Nations Global Compact (UNGC) and the relevant conventions of the United Nations and the International Labour Organization.

4. Building business models in accordance with ecological and ethical principles

Ecological and ethical principles should go beyond labour rights and organic agriculture. They should run through the entire business model starting with resource efficiency, awareness raising within and beyond the company and educating and exchanging views with others about them. Through its education, training and consultancy, SEKEM seeks to create capacity in order to scale up successful and sustainable business models. These are provided by the Sustainable Development Center of the Heliopolis Academy, the SEKEM schools and through the policy work of SEKEM's management. Additionally, SEKEM has developed close ties with different businesses throughout the world which follow the same ecological and ethical principles. These ties go beyond normal business relationships. In 1996, the International Association for Partnership in Ecology and Trade (IAP) was formed, which developed the Sustainability Flower (figure 9) that serves as the conceptual framework for performance monitoring and evaluation. The SEKEM Group has implemented this comprehensive management system, integrating the four dimensions of sustainable development (ecology, economy, society, culture), and provides annual reports on progress and achievements relating

Figure 9: The Sustainability Flower

Source: SEKEM (2010).

to the Flower.

5. Innovating for sustainable development through research in natural and social sciences

Sustainable businesses need to be innovative in order to remain sustainable and competitive. The Heliopolis Academy for Sustainable Development, established by the SDF, aims at improving the capacity to conduct, publish and disseminate relevant social and scientific research in the areas of medicine, pharmaceuticals, renewable energy, biodynamic agriculture, arts and social sciences. One among many such scientific services is the breeding of predators that serve as a form of biological pest control.

Incorporated within the Heliopolis Academy are several laboratories and the Sustainable Development Center, which is the focal point for all issues revolving around sustainable development, while El Mizan provides healthy, profitable indoor and outdoor grafted seedlings to Egypt's vegetable producers and to SEKEM for Land Reclamation.

6. Advocacy for a holistic approach to sustainable development

It requires more than just a few sustainable businesses to contribute to food security and to climate change mitigation and adaptation. The policy engagement of the SEKEM management focuses on this aspect. In

addition, SEKEM is seeking to institutionalize its efforts through the Heliopolis University for Sustainable Development – the first non-profit university in the region. The university seeks to educate the youth, both in Egypt and those coming from abroad, on the concept of sustainability and its further applications in all the different sectors of the economy. Responding to the challenges of the twenty-first century such as climate change, resource scarcity, a growing population and extreme poverty, Heliopolis University was established to drive research and deliver innovative findings that could provide sustainable solutions for some of the major problems confronting Egyptian society.

C. Concrete sustainability effects and gains in terms of economic, social and environmental impacts

The activities of SEKEM have had substantial positive impacts on the community, nature and businesses. The community has profited significantly from the cultural activities of the SEKEM Development Foundation, which is mainly funded through the SEKEM Group. Over 600 students in its school and the vocational training centre profit every year from the education they receive. The schools are open to everyone and are accredited by the Government. The dual system of the vocational training centre (offering practical experience in the workshops as well as theoretical courses) is a huge success, and its graduates are in great demand. Additionally, the medical centre provides health-care services to over 30,000 people in the surrounding villages and to employees of the SEKEM companies. Other facilities, such as concerts and art courses, promote the individual development of the participants.

With regard to the environment, SEKEM has created a new biotope by turning desert land into fertile and living soils through compost and biodynamic agricultural methods. The soil's water holding capacity has been increased, and thereby water consumption reduced. New technologies, such as subsurface irrigation, have further contributed to cutting down on water consumption. SEKEM's main farm site serves as a habitat for more than 60 species of birds – both migrating and local – more than 90 varieties of trees and shrubs, and a broad range of small animals such as hedgehogs, lizards, snakes and foxes. Furthermore, over the years, over one million tons of CO₂-equivalents have been sequestered in the

soil, which shows the great potential of agriculture to mitigate climate change. The positive effects of the introduction of organic agriculture into the region are manifold and invaluable for the environment. For example, SEKEM has succeeded not only in refraining from pesticide use in its own operations, but, more broadly, cutting chemical use by more than 90 per cent on Egyptian cotton farms. To replace chemicals, SEKEM uses pheromone traps and cultivates microorganisms that serve as natural forms of pest control. As a result, the average yield of raw cotton has increased by almost 30 per cent, while the cotton's elasticity and overall quality is superior to that of conventionally grown cotton. While SEKEM is not growing cotton on its farms any more, it still benefits from its former engagement through the increased cotton quality from its suppliers.

In terms of economics, the SEKEM Group has achieved an annual growth rate of about 15 per cent over the past few years. Its holistic approach and its social and cultural activities have strengthened social cohesion within SEKEM, which was evident in the aftermath of the Egyptian uprising when some SEKEM employees even volunteered to protect the SEKEM premises at night.

D. Lessons to be learned

SEKEM sees itself as part of a cultural society in which its economic activities – meaning business revenues – play an important part, but not the major role. Rather, the financial aspect is considered to be only one of many other aspects such as promoting education and the arts, cultivating land and providing health care. Over 30 years of experience have proved that human development is crucial for sustainable farming. People have to be at the centre of such efforts: the more an institution cares for the people (e.g. through better employment conditions, equal treatment, education, medical care, insurance and pension schemes), the more the people will care for the organization and everything vital for its business.

However, organic farming is not enough; organic farms do not necessarily employ, for example, sustainable energy management systems. Some organic farmers might even cultivate their land with monocultures, thereby neglecting biodiversity and the benefits of agricultural methods such as agroforestry. Well aware of this, SEKEM applies biodynamic agriculture approaches, or

agroecological farming, which goes beyond the usual organic standards. This should be a guiding principle for management in order to effectively embed these ecological and ethical principles within the corporate culture. SEKEM is currently seeking to develop and standardize generic guidelines for the Sustainability Flower, as well as to integrate the guidelines and performance indicators into an

assessment software. Through this new platform, agricultural producers, traders, brand owners and other stakeholders will be able to assess, continuously improve and jointly communicate their sustainability performance. The Sustainability Flower guidelines are based on the sustainability reporting standards of the Global Reporting Initiative (GRI), but are adjusted to the needs of the agricultural sector.

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Notes

- 1 Many developing countries have adopted a defensive stance in relation to the liberalization of trade in agriculture. However, the developing countries with more efficient agricultural sectors, which would benefit from higher earnings from their exports if there were fewer restrictions on their market access, especially to developed countries, have now been at the forefront of attempts to liberalize global agricultural trade through the Doha negotiations. There is tension between these countries and the majority of developed countries that have tried to retain their sizeable agricultural support and relatively high tariffs, as well as between them and those developing countries that are seeking to defend their small farmers' livelihoods from import surges. The agriculturally efficient countries have been advocating restrictions on the use of the SSM for developing countries to avoid import surges, on the grounds that their own farmers would be affected by import restrictions (South Centre, 2011).
- 2 The authors would like to thank the following peer reviewers for their comments on earlier versions of this commentary: Klemens van de Sand, Olivier de Schutter, Gunnar Rundgren, Hans Herren, Mark Halle, Nadia El-Hage Scialabba, Peter Lunenborg, Stephan Albrecht, Sophia Murphy, Lim Li Ching, Franz-Theo Gottwald and Thomas Braunschweig.
- 3 For more information, see: http://awsassets.panda.org/downloads/lpr_2012_summary_booklet_final.pdf.
- 4 The World Bank has just published a first study (prepared by the Potsdam Institute for Climate Impact Research and Climate Analytics) examining the specific implications of a global warming of 4 degrees by the end of this century (World Bank, 2012).
- 5 For more information, see the Club of Rome discussion paper by Johnston (2011).
- 6 See: <http://www.fao.org/news/story/en/item/161819/>, using a new estimation methodology. In previous years, based on the previous methodology of estimation, close to one billion hungry were reported. The new report emphasizes that concentration on export crops does often not work in respect to food security.
- 7 For more information, see Interagency Report to the Mexican G20 Presidency (2012).
- 8 For a more elaborate critique, see Hoffmann (2011).
- 9 Brüntrup et al. (2011).
- 10 Today the average yields of *organic* systems are estimated to be about 75 per cent of those of conventional systems (Seufert et al. 2012). Agro-ecological systems are more open to inputs and can therefore be more productive, see Snapp 2011, footnote 22.
- 11 See for example Bayer producing biological remedies http://www.presse.bayer.de/baynews/baynews.nsf/id/Bayer-Crop_science-acquires_Germany-based-biocontrol-company-Prophyta_GmbH?open.
- 12 The preservation of the "regenerative capacity of agriculture" was at the very root of the concept of "sustainability", which was first coined as a principle in German forestry by Carl von Carlowitz more than 300 years ago.
- 13 A recent EU survey estimates the health costs of road transport alone to be 100 billion Euro annually in Europe (European Environment Agency, 2013). The transport of agricultural goods and foodstuffs accounts for about 20 per cent of total transport (INRA, 2012).
- 14 In autumn 2012, the Ukraine, for instance, announced new export restrictions for wheat.
- 15 In Egypt, for example, where most food is imported, due to currency exchange rates food has recently become more and more costly (Schweizer Bauer, 2013).
- 16 Of the developing world's 5.5 billion people, some 3 billion live in rural areas - more than 40 per cent of humanity. Of these rural inhabitants, an estimated 2.5 billion are in households involved in agriculture, and 1.5 billion are in smallholder households. Agriculture provides the livelihood for approximately 2.6 billion people (World Bank, 2008 and UNEP, 2011).
- 17 The attempt of the European Commission to skip value-added tax reduction for unsustainable production is at least a promising step in the right direction (see Agrar-Info 183, July/August 2012, Hamburg, Germany).
- 18 Since the 1960s, global per capita cereal production increased by roughly a third. Conversely, global use of nitrogen and phosphorus fertilizers soared by 8 and 2.5 times; global pesticides use expanded by 8 times and water consumption for irrigation doubled (IAASTD, 2009: 7).
- 19 As aptly put by Rundgren (2012), "how we define 'efficiency, productivity and related technology' will determine the objectivity of our discourse on what we understand by 'modern agriculture'. Paradoxically, we currently consider

production methods as 'modern' that are among the most pollutant, most resource-squandering, most energy-intensive and most dependent on subsidies".

- 20 The 3rd EU SCAR Foresight Exercise talks about a "radical change in food production and consumption", which is necessary (SCAR, 2011:129).
 - 21 See also Netherlands Environmental Research Agency and Stockholm Resilience Center (2009).
 - 22 European Commission (2013).
Natura 2000 is the centrepiece of EU nature and biodiversity policy. It is an EU-wide network of nature protection areas established under the 1992 Habitats Directive. The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats. It is comprised of Special Areas of Conservation designated by Member States under the Habitats Directive, and also incorporates Special Protection Areas, which they designate under the 1979 Birds Directive. Natura 2000 is not a system of strict nature reserves, where all human activities are excluded. Whereas the network will certainly include nature reserves most of the land is likely to continue to be privately owned and the emphasis is on ensuring that future management is sustainable, both ecologically and economically. The establishment of this network of protected areas also fulfils a Community obligation under the UN Convention on Biological Diversity. Natura 2000 protects around 18 per cent of land in the EU countries. For more information, see <http://ec.europa.eu/environment/nature/natura2000/>.
 - 23 This ten-year partly participative study in Malawi (a country that temporarily used a 90 per cent subsidy for fertilizers and better seeds to boost maize yields) compared monoculture maize with legume-diversified maize that included annual and semiperennial (SP) growth habits in temporal and spatial combinations, including rotation, SP rotation, intercrop, and SP intercrop systems. Modest fertilizer intensification doubled grain yield compared with monoculture maize. Biodiversity improved ecosystem function further: SP rotation systems at half-fertilizer rates produced equivalent quantities of grain, on a more stable basis (yield variability reduced from 22% to 13%) compared with monoculture. Across sites, profitability and farmer preference matched: SP rotations provided twofold superior returns, whereas diversification of maize with annual legumes provided more modest returns. The study thus provides evidence that, in Africa, crop diversification can be effective at a countrywide scale, and that shrubby, grain legumes can enhance environmental and food security.
 - 24 A recent European Nitrogen Assessment, prepared in the context of the 6th EU Research Framework Programme, found that the costs of nitrogen use in agriculture in EU countries might be significantly higher than its benefits (Sutton et al., 2011).
 - 25 The objective of the SSM is to address situations of a serious decline in national prices because of surges of cheap imports. Therefore, the SSM does not target upward swings in prices, which is the current challenge for most countries.
 - 26 For example: "The governance and regulation of trade, the resilience of food exchange patterns, will therefore be at the heart of future food systems and food security, even in a scenario where maximum regional food self sufficiency is sought. Innovation in regulation systems of global agricultural trade is therefore crucial, but at the same time is at the heart of very important controversies in the field of economics." (The SCAR report, 3rd edition, 2011).
 - 27 See the different food safety approaches in the US and the EU. In the US, for instance, cleaning of beef carcasses before distribution as an end-of-the-pipe-approach with lactic acid, or broilers with chlorine is practiced, whereas the EU is having a strict hygiene regime 'from farm to fork', looking for harmful microbes like salmonella not to appear in any product at any step of the value chain. These are different cultures, which could – the European model being more costly – strongly be affected if free trade agreements come into force. These cultural differences cannot only be matched by scientific justification, as it is the case under current WTO rules.
 - 28 When in 2005 the Millennium Ecosystems Assessment (with some 1300 experts involved the largest ever global assessment) was concluded, four scenarios/development paths were presented: the global orchestration, the order through strength, the adapting mosaic and the techno garden scenario. The mood of the conclusion was that the authors would, if asked, opt for the global orchestration scenario. Now, seven years and many summits and the economic crisis of 2008 later, at least for agriculture and food security we would more opt for the adapting mosaic scenario. It looks for regional solutions, by having the global issues in mind. In the MEA assessment this approach was called "Glocalization" (for more information, see www.maweb.org/en/index.aspx).
 - 29 Experience of organic production systems in East Africa, for instance, show that of the diverse basket of produced items at farm level, only few are destined for marketing beyond the local/regional level, including for export. This concerns items such as spices, vegetables, flowers, nuts, roots or fruits. For more information, see UNEP-UNCTAD, 2008b.
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- 30 See *inter alia* www.lebensmittelpraxis.de/handel/entscheider/1638-megatrend-regionalitaet.html.
 - 31 At the World Economic Forum 2012, Graciano da Silva, Director-General of FAO said in respect to food security: "To stimulate local markets is a key issue" (www.weforum.org/videos/ensuring-food-security-annual-meeting-2012).
 - 32 Dacian Ciolos, EU Commissioner for Agriculture and Rural Development highlighted in a speech on Local Farming and Short Supply Chains: Enhancing the Local Dimension of the Common Agricultural Policy" on 20 April 2012 the importance of short supply chains and the related consumer preferences, which the European Commission wants to support (http://europa.eu/rapid/press-release_SPEECH-12-283_en.htm).
 - 33 See Nestlé's approach to source locally whenever possible and to strengthen rural development (www.nestle.com/csv/ruraldevelopment).
 - 34 Interestingly specialties are often the non-industrial, more artisanal products like Swiss cheese, based on grass and hay- (not silage) feed. With 64.000 tons, Switzerland exports one third of its cheese production.
 - 35 Not "food must travel", as Pascal Lamy claimed in February 2012 in Geneva at the conference of the "Economist" on Feeding the World – the 9 billion dollar question.
 - 36 It should not go without comment at this juncture that agriculture is not the only sector that requires a more local/regional focus faced with new environmental and economic challenges than practices in the last few decades. The much-required drastic changes in the energy mix towards renewable sources are bound to go in tandem with a much higher focus on local/regional production, which matches local/regional consumption and thus avoids transmission and conversion losses. 'Distant' sources of energy supply will still be required to match local/regional production-consumption gaps.
 - 37 See also the discussion and suggestions in De Schutter (2011c).
 - 38 Estimates suggest that some 60 per cent of total support developing countries have provided to their agricultural sector in recent years is linked to green-box measures (Nassar et al., 2009). As the AoA does not set any spending limits on the green box, developing countries' flexibility in pro-actively using it is then a function of budgetary capacity or constraints. The existing set of green-box measures largely reflects the policies of developed countries in place during the Uruguay Round negotiations. The box thus needs to better reflect interests in protecting food security, rural livelihoods and resilience.
 - 39 In many restaurants in Western Europe, the origin of the meat has to be or is being announced these days to build consumer confidence.
 - 40 See www.farmandfoodproject.org.
 - 41 See www.terramadre.org/pagine/rete/comunita.lasso.
 - 42 See www.worldfuturecouncil.org/future_policy_award_shortlist.html.
 - 43 See USDA briefing, at: <http://www.ers.usda.gov/Briefing/FarmPolicy/gov-pay.htm>.
 - 44 However, Berthelot argues that the United States VEETC tax credits for ethanol production should be counted as subsidies to agriculture, which would raise the total support to agriculture provided by the United States. It should be noted, though, that the VEETC tax credits are scheduled to end in 2012.
 - 45 House Agriculture Appropriations Bill, amended June 13, 2011. See: http://republicans.appropriations.house.gov/UploadedFiles/6.13.11_FY_12_Agriculture_Conference_Summary.pdf.
 - 46 Schwarz Group owns the Lidl and Kaufland supermarket chains.
 - 47 World Shipping Council, Record fuel prices place stress on ocean shipping, at: www.worldshipping.org/pdf/WSC_fuel_statement_final.pdf, 2 May 2008.
 - 48 For more information, see: <http://news.orf.at/stories/2082522/>.
 - 49 According to FAOstat and the CBOT Exchange Volume Report of May 2011; see: (www.cmegroup.com/wrappedpages/web_monthly_report/Web_Volume_Report_CBOT.pdf).
 - 50 Lagi et al. have also reviewed the importance of key market fundamentals as explanatory factors for food price hikes, in particular: (a) weather, particularly droughts in Australia, (b) increasing demand for meat in the developing world, especially in China and India, (c) currency exchange rates, and (d) linkage between oil and food prices through higher production and transportation costs. The authors found no significant correlation in this regard.
 - 51 In that volume, see particularly Twarog for an overview of organic agriculture as a trade and sustainable development
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opportunity.

- 52 According to the definition by IFOAM (2008a), “organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.” Note that organic agriculture does not by definition have to be certified; certification is simply one way to guarantee the organic integrity of a product for consumers.
 - 53 These are locally based quality assurance systems that certify producers based on the active participation of stakeholders and built on a foundation of trust, social networks and knowledge exchange (IFOAM, 2008b).
 - 54 This is not to argue for complete liberalization of agricultural markets. Particularly in poorer developing countries where agricultural support structures have been dismantled (e.g. in many African countries), it is difficult for local producers to compete with imports, especially when those imported products have been subsidized or otherwise publicly supported in their countries of origin. Even in developed economies, some individual farmers may struggle to compete.
 - 55 SEKEM in ancient Egyptian means “vitality from the sun”.
 - 56 This issue is discussed extensively in the literature. See, for example, UNRISD, 1974; Swanson, 2007; Inter-Academy Council, 2004; Thompson, 2007; Shiva, 2007 and Mayet, 2007.
 - 57 This contention is supported by numerous studies, such as those by Pretty and Hine, 2001; Lotter, 2003; Badgley et al., 2007; Halberg, 2007; Scialabba, 2007; Hine, 2008; Jordan, 2009; Azeez, 2009; IAASTD, 2009; and De Schutter, 2011a. UNCTAD/UNEP, 2008b.
 - 58 See: Demeter USA, *Biodynamic Agriculture – At a Glance*, 2009, at: <http://demeter-usa.org/downloads/Demeter-At-A-Glance.pdf>.
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