Agriculture Crisis and Sustainable Economic Development: A Global Perspective

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Abstract

World agriculture has entered a new, unsustainable, and politically risky period. Agriculture—and the natural resources it depends on—has been overexploited ecologically, has suffered from underinvestment, has recently been exposed to ill-designed bio-energy programs, and has been politically sidelined for too long. It is now at a critical point. Appropriate responses to the food and agriculture price and productivity crises are lacking. A global initiative for accelerated agriculture productivity is necessary now; such an initiative makes economic sense, is pro-poor and sustainable, and serves security. The initiative needs political leadership and coordination.

There is no effective governance architecture at the global level and national levels to address the matter. Industrialized economies, including the United States, should substantially accelerate their investment in international agricultural research and development (R&D) in cooperation with new players.

Introduction

World agriculture depends mostly on small farms. More than 400 million small farms in the developing world do hardly appear on the radar screens of economic policymakers, though the households connected to these farms are home to the majority of the world’s hungry and poor people. Pressures on food availability are particularly affecting those who can afford it the least—the poor and food insecure. Agriculture is being re-identified as an essential element of economic growth in developing countries where food security also relates to broader security concerns, but this recognition has been too slow in coming. What is required now is a new vision for a transforming, productive and economically sustainable agricultural sector in the developing world.

When it comes to climate change, agriculture is part of the problem and part of the solution because it adds to greenhouse gases and offers opportunities for carbon mitigation. Emerging climate change impacts in developing countries, such as water scarcity and policies for biomass and CO2, further complicate the food supply and price situation. Globalization of retail industries and high-value commodity diversification strengthen the geographical and cross-sectoral linkages in the food system. Though such global economic integration could help the poor, there will be not only winners but also losers.

How can agricultural growth be accelerated and translated into pro-poor and sustainable development in light of the new challenges and pressures. This paper will discuss some recent key changes in the world food system: rapidly globalizing agricultural markets, the integration of the agribusiness chain, increased trade, changing trade policies, high food prices, closer agriculture–energy sector linkages, sustainability threats, and security synergies.

Globalization of the agri food system

Agriculture growth is today very much driven by the demand side—toward consumers who are getting richer and the retail industries that cater to them. The regional and intercontinental integration of the agrifood system is both a consequence of and a factor in the larger process of globalization. The 6.5 billion global consumers are served by a variety of suppliers that include food retailers standing next to the road in Africa as well as modern supermarkets. Supermarkets are supplied by the food processing
and trading industries, which in turn are supplied by the farm sector, which receives its inputs from companies producing fertilizers, agrochemicals, seeds, and other inputs (Figure 1). In this system, international corporations have been increasing their power and leverage. Between 2004 and 2006, the sales of the top 10 food retailers soared by more than 40 percent, while the sales of the top food processors and agricultural input companies grew by 13 and 10 percent, respectively (von Braun 2007). The sustainability of agriculture can no longer be defined by fields or farms or ecologies. Today, agriculture sustainability spans the globe, the whole value chain of food- and agriculture-related inputs and outputs, and includes outcomes such as nutrition, health, and safety.

**Figure 1. The global agrifood business chain, 2006**

<table>
<thead>
<tr>
<th>AGRICULTURAL INPUT INDUSTRY</th>
<th>FARMS</th>
<th>FOOD PROCESSORS AND TRADERS</th>
<th>FOOD RETAILERS</th>
<th>CONSUMERS</th>
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<tr>
<td>Sales top 10: $40 billion</td>
<td>Agricultural value added: $1,592 billion</td>
<td>Sales top 10: $409 billion</td>
<td>Sales top 10: $1,091 billion</td>
<td>$6.5 billion</td>
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The new global power structure of agriculture

Developing countries and middle-income economies are playing an increasingly important role in the global agrifood system. Higher incomes and urbanization are raising food spending in developing countries. In the past 20 years, the United States and Western Europe’s share of world agricultural production has decreased by 9 and 19 percent, respectively, while the share of Brazil, China, and India has substantially increased (Figure 2). The share of agriculture in the economy has fallen in all of the sample countries; its share in the United States and Western Europe is currently at a mere 1 and 2 percent of Gross Domestic Product (GDP), respectively (World Bank 2007a). In contrast, the agricultural sector in Africa currently contributes 20 to 40 percent of overall GDP and employs 60 percent of the labor force (World Bank 2007a, Beintema and Stads 2004).

The integration of the agrifood system becomes most evident in global agricultural trade. Between 1985 and 2005, world trade in agricultural products increased more than threefold (FAO 2008a). Trade is also an area that provides evidence for new developments in the global power system of agriculture. The share of world agricultural exports of one of the major producers—the United States—has declined by 33 percent since 1983-1985 (FAO 2008a). In some of the largest developing countries—China, India, and Brazil—the share has remained almost constant despite rising production due to increased domestic demand. A more open trade regime in agriculture would have far-reaching positive effects, but the negotiations through the Doha Round are currently stalled. Developed countries continue to be a major import market for agricultural commodities and their trade and domestic protection policies have major implications for developing countries.
Table 1. World Cereal production, 2000-2007 (million tones)

<table>
<thead>
<tr>
<th>Year</th>
<th>Wheat</th>
<th>Coarse grains</th>
<th>Rice</th>
<th>Total (right scale)</th>
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<td>1999</td>
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Figure 2. Agricultural production by country and region, % of total

Source: FAO 2008a.

Note: W. Europe includes Belgium, France, Germany, Liechtenstein, Luxembourg, the Netherlands, and Switzerland.

Agriculture policy is today increasingly made outside of the domain of agriculture, and often as an offshoot of energy or infrastructure policy. While the U.S. farm bill includes some biofuel support programs, for example, most government support for biodiesel production is outlined in the energy bill and entails large subsidies. Developing countries are unable to provide agricultural support on such a scale, and especially not in new markets such as for bio-fuels and for CO2 sequestration. The global power system of agriculture now consists of a conglomerate of different players. The playing field includes new actors, such as energy and retail market players, and traditional ones, such as the input industries and food processors. However, global agriculture issues currently have only a limited decision making architecture relating to public goods such as water, climate, and food safety. What is missing is a recognized governance platform that addresses the growth opportunities and sustainability threats on a global scale. The current state of multiple agricultural agendas is risky and leads to serious lack of attention to the management of and investment in agriculture-related global public policy issues. This lack of a coordinated global response is visible in the field of agriculture-energy policies, climate change mitigation and adaptation policies for agriculture, food aid policies, and agriculture-health and food safety policies. It also is evident in the lack of a coordinated response to rising world food prices.
Rising food prices
Surging food and oil prices have turned the attention of policymakers and the public to the world food equation and food–energy price linkages. Between 2000 and 2008, the prices of wheat and petroleum in dollar terms increased more than threefold, while the prices of corn and rice more than doubled (Figure 3). When adjusted for inflation or reported in euros, the price increases are smaller, but also drastic.

Figure 3. Commodity prices (US$/ton), January 2000–January 2008

Sources: Data from FAO 2008b and IMF 2008.

The major drivers of increases in cereal prices have been the high demand for food (and feed) due to income growth (and less so due to population growth), high demand for biofuels, and slow production responses to that rising demand. Between 2000 and 2006, cereal supply increased by mere 8 percent and stocks declined to low levels (von Braun 2007). A rise in cereal prices has uneven impacts across countries and population groups. Households that are net buyers of food, which represent the large majority of the world’s poor, are negatively impacted (von Braun 2007). It is largely the poor who respond to food prices with reduced consumption and changed patterns of demand, leading to calorie and nutrition deficiencies. Since food accounts for a large share of their total expenditures, the impact on the poor can be dramatic. Faced with higher prices, the poor switch to foods with lower nutritional value and to foods lacking important micronutrients.
Expanding biofuel production

The expansion of new sources of biofuels such as ethanol and biodiesel has a strong effect on agricultural prices, since biofuel production largely draws on natural vegetation. Second-generation technology is still a long way away. Incorporating new developments in supply and demand, as well as actual biofuel investment plans IFPRI’s International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) projects that the prices of maize and oilseeds will increase by 26 and 18 percent respectively by 2020. A more drastic expansion scenario doubling the production levels assumed in the first scenario projects even more dramatic increases in the price of maize and oil seeds – by 72 and 44 percent (von Braun 2007).

In addition, biofuels have indisputably created new linkages, trade-offs, and competition between the agricultural and energy sectors. The concentration of demand in developed countries also implies potential for biofuel exports from the rest of the world. Removing trade barriers will facilitate the establishment and expansion of biofuel production in countries with a comparative advantage. On the other hand, distorting subsidy regimes for biofuels and agricultural products used as biofuel feedstock will undermine the comparative advantage of developing countries.

The threats to agricultural sustainability and resources

Agricultural production has experienced impressive growth in many developing countries, but is this growth sustainable. In Sub-Saharan Africa, agriculture has been reaching almost 6 percent growth in recent years (IMF 2007). Yet, when it is driven by area expansion, this growth can undermine natural resources, forests, and water systems. In the main domains of natural resources that are key to agriculture, new threats have become more visible in recent years, and outlooks raise concerns.

Water

Climate change, population growth, irrigation, and industrial expansion increase competition for water. About 1.4 billion people now live in river basins where water use surpasses recharge rates.

In many countries, developed water sources are almost fully utilized, and new sources are becoming increasingly expensive to develop (UNDP 2006). Irrigation provides productivity gains and greater food security, yet it also exerts substantial pressures on limited water resources. In developing countries, irrigated agriculture is the largest user of water resources, accounting for more than 80 percent of water use (FAO 2008c). However, this does not mean that irrigation in the developing world is widely or equally spread. Sub-Saharan Africa, for example, is highly dependent on rainfed agriculture and accounts for less than 5 percent of global irrigation (UNDP 2006). The potential for agricultural expansion needs to be evaluated against existing water resources and the constraints to their expansion. For agricultural growth to be sustainable, efficiency and equity of water use in agricultural production needs to be increased.

Soils

Overgrazing, deforestation, and inappropriate agricultural practices have been some of the major forces behind soil degradation. Inappropriate agricultural practices are often associated with insufficient use of mineral fertilizers, rather than overuse. Farmers apply about 9 kg/ha of fertilizer in Africa, compared to 142 kg/ha in Southeast Asia. Soil degradation affects one-fourth of the world’s agricultural land and the pace of degradation has increased in the past 50 years. Soil quality is a major variable influencing agricultural yields, and erosion has already had significant impacts on the productivity of about 16
percent of the agricultural land in developing countries (Scherr 1999). The goal of simultaneously protecting the environment, assuring the sustainability of global soil resources, and increasing agricultural production should build on increased agricultural productivity and improved agricultural practices.

**Biodiversity**

Biodiversity conservation is severely impacted by the conversion of forests and wild lands to farmland and pastures. Maintaining the genetic richness of crops and varieties is of key importance to farm productivity. Crop genetic improvements have increased resistance to pests, diseases, and climatic shocks. Biotechnology can enhance these positive effects. As a result, yields have increased, but at the same time, crop genetic diversity is eroding as traditional varieties are being widely replaced by genetically uniform and stable modern varieties. Plants that have been guarded and bred by generations of farmers are in danger of being lost and many have recently been placed into storage in the new permafrost genebank in Spitzbergen, Norway.

**Climate change and climate risks**

Climate-change risks will have adverse impacts on food production, compounding the challenge of meeting global food demand. Consequently, food import dependency is projected to rise in many regions of the developing world (IPCC 2007). With the increased risk of droughts and floods due to rising temperatures, crop-yield losses are imminent. In more than 40 developing countries—mainly in Sub-Saharan Africa—cereal yields are expected to decline, with mean losses of about 15 percent by 2080 (Fischer et al. 2005). Other estimates suggest that although the aggregate impact on cereal production between 1990 and 2080 might be small—a decrease in production of less than 1 percent—large reductions of up to 22 percent are likely in South Asia. In contrast, developed countries and Latin America are expected to experience absolute gains. Impacts on the production of cereals also differ by crop type. Projections show that land suitable for wheat production may almost disappear in Africa. Nonetheless, global land use due to climate change is estimated to increase minimally by less than 1 percent. In many parts of the developing world, especially in Africa, an expansion of arid lands of up to 8 percent may be anticipated by 2080 (Fischer et al. 2005). World agricultural GDP is projected to decrease by 16 percent by 2020 due to global warming. Again, the impact on developing countries will be much more severe than on developed countries. Output in developing countries is projected to decline by 20 percent, while output in industrial countries is projected to decline by 6 percent (Cline 2007). Carbon fertilization could limit the severity of climate-change effects to only 3 percent. However, technological change is not expected to be able to alleviate output losses and increase yields to a rate that would keep up with growing food demand (Cline 2007). Agricultural prices will thus also be affected by climate variability and change. Temperature increases of more than 3°C may cause prices to increase by up to 40 percent (Easterling et al. 2007). The riskier climate environment that is expected will increase the demand for innovative insurance mechanisms, such as rainfall-indexed insurance schemes that include regions and communities of small farmers. This is an area for new institutional exploration.

**Underutilized opportunity: The agricultural growth and poverty-reduction link**

The vision of the future of agriculture in the developing world should not focus on conserving small farms, but should center on a measured and appropriate transformation toward viable farm units and clusters of part-time and specialized farms. Subsistence agriculture is not a viable option for getting out of poverty (von Braun and Kennedy 1994). Increasing rural–urban migration is affecting labor availability for agricultural activities and the flows of goods and money between rural and urban areas. Projections show that urban transformation will continue to occur at an increasingly rapid pace; 61
percent of the world’s population is projected to live in urban areas by 2030 (Cohen 2006). Droughts, land scarcity, and low wages in rural areas, compared to better job opportunities and lower or different risks in urban areas, are increasing labor-related migration out of rural areas (von Braun 2005). However, three-quarters of the poor remain in rural areas and rural poverty is projected to be higher than urban poverty for decades to come (Ravallion et. al. 2007). A massive transformation is in the making—global farm employment is estimated to decrease by about 300 million people by 2020, while employment in services and industry —both in urban and rural areas— is expected to grow by 400 million people. Further development of labor-market institutions is needed to enable the participation of rural areas in the national economy.

The underrated agriculture and security risks

Sustainability of agriculture is today not only a matter of appropriate management and utilization of natural resources and eco-systems, but also a matter of sustainability of states and political systems. For example, energy security objectives led to subsidized expansion of biofuel production, driving up food prices around the world. The poorest suffer silently for a while, but the middle class typically has the ability to organize, protest, and lobby early on. Although domestic causes such as neglect of agriculture and the rural economy may play an important role, the people’s disenchantment is frequently diverted by political leaderships to external causes. The trivial energy security gain brought about by biofuel production here may be largely overwhelmed by broader losses in political security emerging from frustration and aggression. Increased engagement of the United States in international agriculture capacity strengthening could correct the problems.

Making the world more peaceful is directly linked to making the world more food secure and affluent. It has long been recognized that social conflict increases food insecurity, but it also needs to be pointed out that food insecurity can be a key source of conflict. Some of the trigger conditions of violence can be directly related to change in the prices of staple foods or cash crops. Unchanneled frustration that is insufficient organized or repressed can lead to conflict (Messer and Cohen 2008). Rising prices of tortillas in Mexico City and bread in Uzbekistan have led to riots.

Conclusion: Serving Sustainability: Toward a Global R&D Initiative

An urgent global R&D initiative for accelerated agricultural productivity Central to the sustainability of world agriculture is a global R&D initiative for accelerated agriculture productivity; such an initiative makes economic sense, is pro-poor and sustainable, and serves security. The R&D initiative needs political leadership and coordination. Industrialized economies, including the United States, should substantially accelerate their investment in international agricultural research and development. Enhanced collaboration of old and new key global agricultural players In order to effectively implement such a global R&D initiative for accelerated agriculture productivity, a new agriculture, food, and nutrition governance architecture is needed to provide the appropriate political response to the global price and productivity crisis. A coordinated global response is needed in the form of agriculture–energy policies, climate change mitigation and adaptation policies for agriculture, food aid policies, and agriculture–health and food-safety policies. Agricultural power has become more spread around the world, with the result that there is no governance architecture that can generate appropriate political responses to the food and agriculture price and productivity crisis at the global and national levels. Under such a new global architecture, new partnerships among old and new players such as the United States, Europe, China, India, Brazil, UN agencies, the CGIAR, and foundations, and the private sector must be facilitated.
References


