domestic small-scale farm sector and its contribu-
tion to national food security.

• Developing country governments will need to 
facilitate adequate renumerations and a mini-
mum level of price stability for their small-scale 
sector to encourage increased domestic food 
production and increased investment in im-
proved agricultural practices. Policy options in-
clude regulation of middlemen and a renewed 
direct role for government in providing credit 
and marketing for the small-scale sector.

• Support for collective efforts of farmer organi-
zations will be needed to achieve more equal 
access to and distribution of the benefits of 
trade.

• Strengthen regionally managed reserves of 
emergency foodstocks, which can help buffer 
future price shocks.

• Improve tenure and access to resources, credit 
and insurance for small-scale producers to in-
crease the sector’s contribution to national food 
security, as well as improved rural livelihoods 
and environmentally sustainable management 
of agricultural landscapes.

• Address market concentrations, especially in 
grain markets, at the global level.

• Increase public investment in agriculture (mar-
ket roads, AKST, R&D, extension, marketing 
information and services, postharvest facilities, 
support for cooperative marketing, etc.) in food 
insecure developing countries.

• Mobilize the capacities of supermarkets and 
other public and private actors along value-
adding chains to offer consumers affordable, 
safe, healthy, fair trade foodstuffs that demon-
strate commitment to poverty reduction, envi-
ronmental and climate change goals.

• Promote the diversification of production sys-
tems through inclusion of locally important spe-
cies/crops to develop a wide range of market-
able natural products that can generate income 
for the rural and urban poor in the tropics and 
provide ecosystem services, such as soil and 
water conservation.

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Food Price Volatility

The underlying causes of the most re-
cent increases in food prices are complex 
and include factors such as increased 
demand from rapidly growing economies 
(especially China): poor harvests due 
to an increasingly variable climate (e.g., 
the Australian drought); the use of food 
crops for biofuels (e.g., maize for bioetha-
ol); higher energy and fertilizer prices; low 
food stocks; speculation on the commod-
ity futures market; and in response to the 
high food prices, restrictions imposed on 
agricultural commodity exports by a num-
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to order go to www.islandpress.org/iaastd.

Source: FAO, 2004

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Current and future drivers of food price volatility

Energy markets

The challenge of increasing productivity and incomes, particularly for small-scale producers, is exacerbated because high technology agricultural inputs are fossil fuel dependent and fossil fuel prices are expected to continue to be high. The advent of modern biofuels technology, predominantly of biofuel crops, has increased the risk of food shortages for small-scale producers. Globally, the seed industry is increasing driven by North America and Europe (NAE) based transnational agribusiness firms. Many of the increases in global market concentration were

Investment in public good research directed at improving the livelihoods of small-scale producers represents the greatest potential for increasing food security. It can have high economic rates of return, help reduce poverty, and create significant employment opportunities in agroenterprise development and diversified, value-adding employment.

In many countries, a decline in nutritional security has resulted from an almost total dependence on a few staple crops. This increase in food insecurity, as well as significant opportunities to commercialize traditional cultivars of plants, trees and livestock, and to domesticate new food and medicine crops gathered from forests, powerfully argue for increased public and private investments in agriculture.

Market concentration

Important agricultural markets are dominated by a few seed firms. Traditionally, the seed industry was characterized by a large number of small firms. However, increased international support and investment, so that countries can better weather price volatility on their populations.

Natural resource states and trends

Conventional technologies such as classical breeding techniques, tissue culture and cultivation practices have boosted, for instance, wheat yields up to 33% even in the absence of fertilizer. But these gains have come at huge and unsustainable costs to the environment and natural resources. Soils, water, vegetation and biodiversity remain essen
tial determinants of food production on-farm. At the same time, the mosaic of forest, livestock and farm

Regional distribution of small-scale farms (< 2 ha).

Source: FAO

Optimal consumer-driven production systems.

Significant new drivers, and drivers of increasing urgency are forcing the pace of change. We are in a very different world than that of the Green Revolution era. Current energy, financial and climate crises increase the likelihood of future food price volatility unless national food production capacity is enhanced so that countries can better weather increasing international price and supply volatility. Developing countries need policy flexibility in ag
tural production, ensuring that with significant increased international investment and support, so they can increase domestic food production and buffer the devastating impact of price volatility on their populations.

Agricultural policies for farmers. This transition towards climate change adaptation agricultural systems is all the more challenging, given the anticipated agronomen
tal limitations outlined above. Countries with increased income-re
duced demand for animal protein products.

In many parts of the world, farmers already experi
ence less predictable rainfall and temperature, ex
treme weather events and unpredictable shifts in zoonotic diseases, plant health and insect predator

Choosing options that work

The IAASTD reports were accepted by governments at a time of growing debate on food security, op
tions for action and the implications for knowledge, science and technology policies. The case for re
duced effort and attention to food security has been made and seems to be widely accepted. Govern
ments are still debating the role of food sovereignty— the right of peoples and sovereign states to demo
stratively determine their own agricultural and public goods policies.

The IAASTD points toward urgent areas for more policy and AKST focus, finding that:

• Food security in different countries around the world will be best served by seeking a diversity of pathways depending, in part, on history and context.

Hidden dimensions

One of the barriers to faster and wider transitions to sustainable agriculture and rural development is the lack of adequate, widely used forms of accounting that capture the full environmental and social costs of current food and farming systems. These account

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The IAASSD points toward urgent areas for more policy and AKST focus, finding that:

• Food security in different countries around the world will be best served by seeking a diversity of pathways depending, in part, on history and context.

• Differences in tradition, history, context and re

..
Significant new drivers, and drivers of increasing urgency are forcing the pace of change. We are in a very different world than the one that predated the Favo- lution era. Current energy, financial and climate crises increase the likelihood of future food price volatility unless national food production capacity is enhanced so that countries can better weather increased international price and supply volatility. Developing countries need policy flexibility in agri- culture, decision-making, and investing with significantly increased international investment and support, so they can increase domestic food production and better mitigate the negative impact of price volatility on their populations.

Current and future drivers of food price volatility

Energy markets

The challenge of increasing productivity and in- corporating small-scale producers, is exacerbated because the technology inputs of fossil fuel are fossil fuel dependent and fossil fuel prices are expected to continue to be high. The advent of modern biofuels technology, predominantly of bio-ethanol and bio-diesel, is seen by some as a potential solution to energy security. Globally, the biofuel industry is increas- ingly driven by North America and Europe (NAE) based transnational agribusiness firms. Many of the increases in global market concentration were driven by North America and Europe (NAE) based transnational agribusiness firms. Many of the increases in global market concentration were

Market concentration

Important agricultural markets are dominated by a few large firms. Over the past 40 years, the number of firm and the increases in global market concentration were driven by North America and Europe (NAE) based transnational agribusiness firms. Many of the increases in global market concentration were

Market concentration

Conventional technologies such as classical breeding techniques, tissue culture and cultivation practices have boosted, for instance, wheat yields by up to 33% even in the absence of fertilizer. But these gains have come at huge and unsustainable costs to the environment and natural resources. Soils, water, vegetation and biodiversity remain essen- tial determinants of food production on-farm. At the same time, the mosaic of forest, livestock and farm- ing enterprises in the landscape will need to evolve to multifunctional designs that conserve hydro- logical flows and drinking water quality and enhance bio- logical flows and drinking water quality and enhance biodiversity. The need for biodiversity is even more important in the face of market and climate shocks and sur- prises. The IAASTD reports were accepted by governments in all regions, particularly developed countries, makes a very large claim on this reasoning.

Choosing options that work

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Current and future drivers of food price volatility

Energy markets

The challenge of increasing productivity and incomes, particularly for small-scale producers, is exacerbated because technology inputs in agricultural decision-making, paired with significantly increased international support and investment, so they can increase domestic food production and better weather the increasing impact of price volatility on their populations.

Market concentration

Important agricultural markets are dominated by a few large companies. Globally, the seed industry is increasingly driven by North America and Europe (NAE) based transnational agrobusiness firms. Many of the increases in global market concentration were initially driven by North America and Europe (NAE) based transnational agrobusiness firms. These designs would develop the significant opportunities in agroenterprise development and increase opportunities to small-scale farmers and rural entrepreneurs.

Natural resource states and trends

Conventional technologies such as classical breeding techniques, tissue culture and cultivation practices have boosted, for instance, wheat yields by up to 33% even in the absence of fertilizer. But these gains have come at huge and unsustained costs to the environment and natural resources. Soils, water, vegetation and biodiversity remain essential determinants of food production on-farm. At the same time, the mosaic of forest, livestock and farming enterprises in the landscape will need to evolve toward multifunctional designs that conserve hydrological flows and drinking water quality and diversify farming systems to confer greater resilience in the face of market and climate shocks and surpluses.

Market concentration

Market concentration

Some see market transport of ‘virtual water’ in food trade as a much larger claim on this resource.

One of the barriers to faster and wider transitions to sustainable agriculture and rural development is the lack of adequate, widely used forms of accounting that capture the full environmental and social costs of current food and farming systems. These account for educating their children and health care.

Choosing options that work

The IAASTD reports were accepted by governments at a time of intensifying debate on food security, options for action and the implications for knowledge, science and technology policies. The case for renewed effort and attention to food security was made and seems to be widely accepted. Governments are still debating the role of food sovereignty – the right of peoples and sovereign states to democratically determine their own agricultural and public policies.

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domestic small-scale farm sector and its contribution to national food security.

- Developing country governments will need to facilitate adequate remuneration and a minimum level of price stability for their small-scale sector to encourage increased domestic food production and increased investment in improved agricultural practices. Policy options include regulation of middlemen and a renewed direct role for government in providing credit and marketing for the small-scale sector.

- Support for collective efforts of farmer organizations will be needed to achieve more equal access to and distribution of the benefits of trade.

- Strengthen, regionally managed reserves of emergency foodstocks, which can help buffer future price shocks.

- Improve tenure and access to resources, credit and insurance for small-scale producers to increase the sector’s contribution to national food security, as well as improved rural livelihoods and environmentally sustainable management of agricultural landscapes.

- Address market concentrations, especially in grain markets, at the global level.

- Increase public investment in agriculture (market roads, AKST, R&D, extension, marketing information and services, postharvest facilities, support for cooperative marketing, etc.) in food insecure developing countries.

- Mobilize the capabilities of supermarkets and other public and private actors along value-adding chains to offer consumers affordable, safe, healthy, fair trade foodstuffs that demonstrate commitment to poverty reduction, environmental and climate change goals.

- Promote the diversification of production systems through inclusion of locally important species/crops to develop a wide range of marketable natural products that can generate income for the rural and urban poor in the tropics and provide ecosystem services, such as soil and water conservation.

The International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) was an Intergovernmental Plenary in Johannesburg in April 2008. The assessment was sponsored by the United Nations, the World Bank and the Global Environment Facility (GEF). Five UN agencies were involved: the Food and Agriculture Organization (FAO), the UN Development Programme (UNDP), the UN Environment Programme (UNEP), the UN Educational, Scientific and Cultural Organization (UNESCO) and the World Health Organization (WHO).

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Developments in agriculture over the last fifty years have increased yields sufficiently to provide on average more than enough food for everyone on the planet. But approximately 850 million people around the world are not able to obtain enough food to lead healthy and productive lives. The volatility and increase in food prices, which began about 2006 and led to food riots in the summer of 2008, put some 100 million additional people at risk of food insecurity.

Over 70% of the world’s poor in developing countries live in rural areas and are directly or indirectly dependent on agriculture for their livelihoods. These people are the most food-insecure. Pastoralists, fishermen and forest users, as well as the urban poor, are also badly affected.

In many developing countries underinvestment in the agricultural sector, the dismantling of public support programs and the impacts of trade liberalization have undermined the small-scale farm sector and national food production capacity, leaving these countries even more vulnerable to price volatility. At both national and international levels, a sharp decline in the rate of growth in agricultural research and development investment in developing countries from the late 1980s onwards, especially in sub-Saharan Africa, has limited agricultural technology development that could benefit local food production. Investment in the agricultural sector has focused largely on export crops to generate foreign exchange, forcing countries to rely on continued low international food prices to meet national food demand. That strategy has failed.

The short-term responses of governments and international agencies to the current crisis, such as lowering food import tariffs and imposing export restrictions, have helped provide immediate relief to consumers, and might be viewed as necessary fire-fighting interventions, but against a fire already well ablaze. These blunt short-term policy interventions do not effectively increase food security over the long term.
Food Price Volatility

The underlying causes of the most recent increases in food prices are complex and include factors such as increased demand from rapidly growing economies (especially China), poor harvests due to an increasingly variable climate (e.g., the Australian drought); the use of food crops for biofuels (e.g., maize for bioethanol); higher energy and fertilizer prices; low food stocks; speculation on the commodity futures market; and in response to the international agencies to the current crisis, such as lowering food import tariffs and imposing export restrictions, have helped provide immediate relief to consumers, and might be viewed as necessary fire-fighting interventions, but against a fire that is growing. The short-term responses of governments and international agencies to the current crisis, such as lowering food import tariffs and imposing export restrictions, have helped provide immediate relief to consumers, and might be viewed as necessary fire-fighting interventions, but against a fire that is growing.

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Underinvestment in domestic agricultural production for national food security

In many developing countries underinvestment in the agricultural sector, the dismantling of public support programs and the impacts of trade liberalization have undermined the small-scale farm sector and national food production capacity, leaving these countries even more vulnerable to price volatility. At both national and international levels, a sharp decline in the overall rate of growth in agricultural research and development investment in developing countries from the late 1980s onwards, especially in sub-Saharan Africa, has limited agricultural technology development that could benefit local food production. Investment in the agricultural sector has focused largely on export crops to generate foreign exchange, forcing countries to rely on continued low international food prices to meet national food demand. That strategy has failed.

Issues in Brief

Food Security in a Volatile World

The International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) provides information on how agricultural knowledge, science and technology can be used to reduce hunger and poverty, improve rural livelihoods and human health, and facilitate equitable, environmentally, socially and economically sustainable development. The full set of IAASTD reports includes a Global and five sub-Global reports and their respective summaries for Decision Makers as well as a Synthesis Report, including an Executive Summary. The reports were accepted at an Intergovernmental Plenary in Johannesburg in April 2008.

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