

# CSR Manager



Newsletter # 1

October 2012



## Spotlight: Food Crisis

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## The Global Food System, Environmental Protection, and Human Rights

By [Prof. Carmen G. Gonzalez](#) (Seattle University School of Law)  
09:32 AM, February 20, 2012

The global food system is exceeding ecological limits while failing to meet the food needs of a large segment of the world's population. According to the United Nations Food and Agriculture Organization (FAO), more people are undernourished today than forty years ago. Approximately 925 million people experience chronic food insecurity, and we are not on target toward achieving the Millennium Development Goal of cutting world hunger in half between 1990-92 and 2015. [FAO](#), [The State of Food Insecurity in the World 2010\(2011\)](#). The widespread industrialization of agricultural production places enormous pressure on the world's ecosystems, causing soil degradation, deforestation, loss of agrobiodiversity, and the contamination and depletion of freshwater resources. Agriculture, a major source of anthropogenic greenhouse gas emissions, contributes to climate change; and climate change threatens global food production by increasing the frequency and severity of droughts, floods and hurricanes, depressing agricultural yields, and placing yet additional stress on finite water resources. This article examines the underlying causes of the converging food, agrobiodiversity, and climate crises, and proposes integrated measures that the international community might take through law and regulation to promote a more just, resilient, and sustainable food system.

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Agriculture is currently the principal driver of biodiversity loss, primarily through the conversion of forests, grasslands, and wetlands to large-scale agricultural production, but also through unsustainable rates of water use, pollution of lakes and rivers, and introduction of nonnative species. The United Nations Millennium [Ecosystem Assessment](#) concluded that approximately 60 percent of the ecosystem services examined have been degraded or used unsustainably to satisfy growing demands for food, water, timber, and fuel. This degradation of ecosystem services disproportionately impacts the rural poor, and impedes efforts to combat poverty and hunger. Millennium [Ecosystem Assessment](#), [Synthesis Report: Ecosystems and Human](#)

Well-Being (2005).

The genetic diversity of the world's food supply is also threatened. Seventy-five percent of the world's food crop diversity was lost in the twentieth century as farmers abandoned traditional food crops in favor of a narrow range of domesticated plant species. Only 12 crops currently supply 80 percent of our dietary energy from plants. FAO, First Fruits of Plant Gene Pact (June 21, 2009). Genetic diversity within these crops has been declining as well because high-yielding varieties have supplanted traditional local varieties. This loss of genetic diversity increases the risk of catastrophic crop failure akin to the Irish potato famine, and deprives plant breeders of the germplasm essential for the development of crops capable of thriving in a changing and warming climate.

Climate change will exacerbate food insecurity and loss of biodiversity. Water scarce regions of the world are predicted to experience chronic drought as the climate becomes hotter and drier, with severe impacts in the semi-arid areas of Latin America and Sub-Saharan Africa. Coastal areas will be buffeted by hurricanes, rising sea levels, and floods. Climate change is also anticipated to have devastating impacts on biodiversity – reducing the productivity of the world's fisheries and accelerating the extinction of species and the loss of ecosystem services vital to food production. The households and countries most likely to be adversely affected are those most reliant on local agricultural production, which already face chronic food insecurity. FAO, Climate Change, Water, and Food Security (2011).

Ironically, agriculture is also one of the greatest contributors to global warming. Agriculture is responsible for nearly one third of global anthropogenic greenhouse gas emissions, including nitrous oxide from increased fertilizer use, methane from rice and livestock production, carbon dioxide from the clearing of forests to create agricultural land, and indirect emissions from the manufacture of fossil fuel-based agricultural inputs and from the processing, packaging and transportation of food. FAO, World Agriculture: Towards 2015/2030 (2003).

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#### ABOUT THE AUTHOR

**Gonzalez, Carmen G.**

*Carmen G. Gonzalez is a Professor of Law at Seattle University School of Law in the United States. She has published widely in the areas of international environmental law, environmental justice, trade and the environment, and food security. In 2011-12, she served as Chair of the Environmental Law Section of the Association of American Law Schools. She is also a member of the Board of Trustees of Earthjustice, a member of the Research Committee of the International Union for the Conservation of Nature (IUCN) Academy of Environmental Law, and a member scholar of the Center for Progressive Reform, a non-profit research and educational organization of university-affiliated academics that seeks to inform policy debates regarding environmental regulation. She has served as member and vice-chair of the International Subcommittee of the National Environmental Justice Advisory Council (an advisory body to the U.S. Environmental Protection Agency on environmental justice issues), and has represented non-governmental organizations in multilateral environmental treaty negotiations. Professor Gonzalez holds a B.A. in Political Science from Yale University and a JD from Harvard Law School.*

*The views expressed in this article are the author's own and do not necessarily reflect CSR Manager's editorial policy.*

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## Global Food Price Volatility and Spikes: An Overview of Costs, Causes, and Solutions

By [Prof. Joachim von Braun](#) (Center for Development Research)

09:00 AM, August 29, 2012

Since the 2007-08 food crisis, many thoughtful analyses have addressed the causes and impacts of high and volatile international food prices and proposed solutions to the crisis. These studies have covered global as well as local food price dynamics and policy reactions. The food price problem is, however, far-reaching, and its impacts are wide and interrelated. The price formation mechanism has become highly complex and dynamic. Policy actions are politically and economically sensitive. This situation calls for continuous and comprehensive assessments of the problem to provide timely and evidence-based knowledge for policy makers. This paper reviews existing evidence and theories and presents new thoughts and insights from analyses to enlighten the course of actions to be taken.

Our review implies that the current body of literature concentrates on high food prices. Commodity price analysis should, however, differentiate between three types of price changes: trends, volatility, and spikes. While price trends are important in the long term, volatility and spikes are more important in the short to medium terms. Descriptive statistics indicate that all three price changes are increasing over time and show strong correlations among themselves. A rising medium-term price trend has triggered extreme short-term price spikes and increased volatility.

An assessment of the costs of price volatility has shown that the existing literature follows a conventional marginal-cost approach that considers only few cost components. Direct and immediate components have not been adequately analyzed, and long-term effects have been overlooked. The effect on child nutrition and health is one such long-term effect. Under-nutrition in early childhood has negative consequences for lifetime earnings capacity because of the physical and mental impairment it causes. Economy wide distortions and misallocations also threaten the long-term development of commodity-dependent economies. Measuring and estimating the

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cost of food price volatility should factor in ongoing processes such as economic growth and technological changes.

The supply, demand, and market explanations for high and volatile global prices have been differentiated as exogenous and endogenous factors. To help further identify the drivers of food price changes, they are categorized as root causes, intermediate causes, and immediate causes. Both empirical and theoretical evaluations suggest extreme weather events from the supply side, biofuel production from the demand side, and speculation in commodity futures from the market side are the three most important root causes of observed price volatility. The theoretical and empirical effects of speculation in commodity futures are not yet well understood. However, speculative trading in commodity futures should not be viewed as a random bet that can be smoothed out through the price system. It is important to consider the market and nonmarket contexts that guide the behavioral and strategic choices of speculators. Whereas speculation caused by manipulative, disorderly behaviors and 'financialization' are damaging, speculation caused by demand and supply in physical markets can serve as price discovery, liquidity, and risk-hedging mechanisms. Our empirical analysis to quantify the importance of these factors shows that speculation effect is stronger than demand- and supply-side shocks for short term price spikes.

Overall policy interventions at global, regional, and local levels should concentrate on reducing price spikes and protecting poor people from short- and long-term crises. The formulation and implementation of such policies must be supported with timely information and research-based evidence. A comprehensive portfolio of policy actions is proposed here, rather than over-extended individual measures to address the root causes or over-regulation of markets to address volatility and spikes. Evaluation of policy instruments should weigh the true costs associated with both, action versus inaction.

Research must focus on developing price and food security indicators and models that will guide policy implementation also in the short run. Such models are currently missing.

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##### **von Braun, Joachim**

*Joachim von Braun is an economist, with a Doctoral degree in agricultural economics from University of Göttingen, Germany. He joined ZEF as Professor and Director of the Department for Economic and Technological Change in December 2009. He was also Director at ZEF during its foundation phase 1997-2002. Before returning to ZEF, von Braun was Director General of the International Food Policy Research Institute (IFPRI) based in Washington, DC, U.S.A. 2002 to 2009. von Braun also has been Professor for Food Economics and Policy at Kiel University, Germany. His research addresses international development economics topics, incl. markets and trade; poverty; health and nutrition; science and technology. von Braun serves on various boards of publishers of journals, as well as national and international advisory bodies of research and policy organizations. 2000-03 he was President of the International Association of Agricultural*

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## World Food Programme: High Food Prices - 10 Questions Answered

01:03 PM, August 21, 2012

The recent drought in the United States and its impact on maize prices has focused the world's attention back onto global food prices. The latest data from the UN Food and Agriculture Organization shows that prices are in fact up a little after a period of decline. High food prices not only put a strain on the already tight food budgets of the world's poor, but raise the price of helping them with food aid

The causes and the effects of the current high food prices are diverse. To help you get a grasp of what it all means, here are the answers to 10 key questions:

**1. How high are food prices really?**

The global food price index produced by the UN Food and Agriculture Organization (FAO) climbed by 6 percent to 213 points in July after three months of decline. But this is still well below the historic peak of 238 points, which was reached in February 2011.

**2. What produced the sudden rise in July?**

The sharp rebound was mostly driven by a surge in grain and sugar prices. According to FAO, the recent drought maize-growing areas of the United States means the US crop is expected to be considerably lower than previously predicted. This pushed maize prices up by 23 percent in July.

**3. Is this the start of a new upward trend?**

It's too early to say. For the time being rice prices are stable and that is an important factor. But, in general, there are many signs that high food prices and volatility will continue in coming years, making farmers, consumers and countries more vulnerable to poverty and food insecurity. FAO wrote an informative report on this in 2011.

**4. Why should volatility continue?**

One reason is that experts expect extreme weather will become more frequent in coming years, and this

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will have an impact on crop production. Another is that there will be increasing demand for food from consumers in fast-growing economies. Meanwhile, growth in biofuels is also a factor, the [FAO](#) report says. Of course, there is also the simple fact that the world's population is growing.

**5. What sort of countries are vulnerable to rising food prices?**

High food prices are a problem for poor countries that have to import a lot of food to feed their populations. Countries will also be vulnerable if they already have high inflation, have limited foreign currency reserves and if their local currencies are depreciating against the US dollar.

**6. How do people in poor countries cope?**

In some of the countries where WFP works, there are households that spend as much as 60-80 percent of their income on food. In these situations, higher prices clearly hit hard. Families cut the number of meals they have a day, they buy cheaper, less nutritious food and spend less on things like schooling and medicine.

**7. Aren't high food prices good for poor farmers?**

High food prices could represent an opportunity for people who make a living from agriculture. The trouble is that many of these people don't produce enough food even for themselves, let alone to sell any. Many do not have access to the markets where prices are higher nor the resources they need for inputs like fertilizer to increase their yields.

**8. How do high food prices affect WFP?**

Rising food prices affect WFP in two ways: it costs us more to purchase food for the hungry and, the number of people needing food assistance increases. If prices continue to rise, WFP could face a budget gap. We will then be forced to make the kinds of painful decisions that we faced in 2008 – reduce rations, decrease beneficiaries or seek additional resources.

**9. How much food does WFP buy?**

In 2011, WFP bought US\$ 1.2 billion worth of food commodities. Of that, US\$ 870 million came from developing countries. WFP tries to forward purchase food while market prices are relatively low in order to minimise the impact on our budget, but every 10 per cent increase in the price of our food basket, costs us an additional US\$200 million a year to buy the same amount of food.

**10. How can we ensure a stable food supply to the most vulnerable populations?**

There are several things that countries can do. A key one is to develop emergency food reserves systems. Another important answer is to scale up 'social safety nets' such as mother and child nutrition programmes and school meals programmes. It's also crucial to support smallholder farmers, many of whom are women. Strengthening commitments to exempt humanitarian food from export bans would also be advisable.

*Source: United Nations World Food Programme*

[See WFP's 5-point plan](#)

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## The times they are a-changing

By [Anders Dahlbeck](#) (ActionAid)  
11:28 AM, October 19, 2012

In 2008, ActionAid started campaigning to remove biofuels targets that are having a detrimental effect on poor and marginalised communities around the world. We did so in response to calls from communities and partners we work with in the global south, for whom the impact of biofuels production was becoming untenable. Countless cases of land grabs by multinationals to produce industrial biofuels for export to rich countries were the main issue.

At the time, the impact of biofuels on hunger and poverty elsewhere in the world was received as quite a marginal issue. At our first meetings with European decision-makers back in 2008, we were often met with blank stares, incomprehension, or conspiracy theories. Why were we so keen to kill a booming sector in Europe at a time when Europe desperately needed to create new jobs and tackle climate change?

Even when presented with the evidence of the impacts of biofuels, many doubted that transport fuel targets within the Renewable Energy Directive would ever change. But the fact that using food for fuel in a world where almost 1 billion people go hungry is not a good idea, has taken hold. The concept of pouring billions in subsidies from European taxpayers into unsustainable first generation biofuels is now being seriously questioned.

In recent years citizens across Europe have gotten on board with a campaign. Is it right that energy security in Europe should compromise food and land security in some of the poorest countries of the world? Should others bear the cost of our fuel consumption? This idea was portrayed in the ActionAid spoof video Drive Aid. So far, 44,000 Europeans have signed up to an ActionAid petition calling for an end to government support for industrial biofuels. And that number is rising.

A couple of weeks ago, a joint statement from Energy Commissioner Oettinger and Climate Action Commissioner Hedegaard acknowledged the direct relationship between using food for fuel and global hunger.

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Next week they will officially publish a proposal that will see a 5% cap on biofuels which are based on food. This set of events would have been unimaginable a few years ago.

The European Commission will get a chance to explain this change of heart at a panel organised by the pan-European NGO confederation Concord at the European Development Days in Brussels next week entitled 'Promoting Biofuels, Creating Scarcity?'.  
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The real impacts of European biofuels policies have become irrefutable. A lot has changes in three years – the times are indeed a-changing.

[Download the report "Fuel for thought"](#)

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#### ABOUT THE AUTHOR

***Dahlbeck, Anders***

*Anders Dahlbeck works for ActionAid, a development NGO focusing on alleviate poverty globally and supporting poor and marginalised communities in the global south to claim their rights.*

*The views expressed in this article are the author's own and do not necessarily reflect CSR Manager's editorial policy.*

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## A Chinese farm in Africa

By [Lila Buckley](#) (International Institute for Environment and Development)  
04:13 PM, September 24, 2012

Chen promotes new agricultural techniques in China, but he dreams of farming in Senegal. Not because he is a cog in a neo-colonial machine driven by a Beijing masterplan to take over Africa, but because he wants to share his skills and do something meaningful.

“My real dream is to have my own farm,” 45-year-old Chen tells me as we drive through the lush countryside of rural Hubei Province in eastern China. “It would showcase environmental approaches for others to learn from.” Chen describes his vision of a self-sufficient agricultural system integrating aquaculture, livestock, grain and vegetable production, supported by clean energy and closed-loop waste and water management. But this dream farm is not here among the vivid green potato and rapeseed fields of Chen’s hometown—this Chinese farm would be far away on the other side of the globe in Senegal.

I first met Chen in 2010 in Senegal where he was working in an agricultural training programme as part of a diplomatic mission under the Chinese Ministry of Commerce. That was where—living amongst Chen and his colleagues on a farm outside of Dakar for several weeks—I first encountered Chinese agriculture engagement in Africa. He and 14 other Chinese agronomists had spent two years on two separate sites as part of an ongoing collaboration between the Chinese and Senegalese government to promote development of Senegal’s agriculture sector.

But the programme was wrought with difficulties—communication barriers, lack of trust on both sides, project design flaws— that left both the Chinese and their Senegalese collaborators frustrated much of the time. It was a difficult two years for Chen—his first time outside of China, working in an unwelcoming environment, far from his family.

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Now back in China, Chen has returned to his previous job in his city's 'Agriculture Technology Promotion Centre'—part of a vast network of such centres throughout the country responsible for improving agricultural varieties and techniques, and introducing them to local farmers. He drives me around the farms and shows me with pride the work that he is doing. From what I can tell, it's much like what he did in Senegal, only without the language barriers and trouble with local partners.

In contrast to the input-intensive monocultures driven by agribusiness in China, Chen's job is to help farmers improve their productivity while reducing their inputs of fertilisers, pesticides and labour. He develops collaborative experiments with smallholder farmers on their own land, testing out new growing techniques, organic soil treatments, and pest control. "It is interesting and good work helping the farmers improve their production," he tells me as we walk through the rapeseed field. "And we have good relations with the farmers. They welcome this input and are willing to experiment as long as we can guarantee the methods won't make them lose money. When they do lose money, we subsidize them for the loss. Usually though, our methods enable them to increase their revenue from the start."

Chen loves his work—you can feel it in the way he talks about the new techniques they are using to grow potatoes, and hear it in the deep laughs he exchanges with his farmer trainees. "I love working with plants, in a natural environment," Chen tells me. "Plants are forgiving. If you mess up, you can just pull them out and start over. You can see them growing every day and watch their progress. They give me hope." As I walked through the fields, life teeming all around me, I too feel a sense of security and optimism about the state of China's agriculture—with its organised network of Technology Promotion Centres and the focused attention from dedicated people like Chen.

"With things going so well here, why dream of a farm in Senegal?" It is a question I've been mulling over since my first trip to Senegal, and I pose it to Chen. I understand that wages for these kinds of postings are attractive, but Chen is suggesting a desire to branch out on his own—without Chinese government support.



**Field of Potatoes.**  
**Photo: HamZta/flickr**

And a growing number of other Chinese farmers are doing the same—looking to Africa for agriculture investments, trade and development cooperation. Global media headlines would have us believe that these Chinese farmers are merely cogs in a neo-colonial machine driven by a Beijing masterplan to take over Africa. But from where Chen sits, Chinese farming in Africa is more about personal opportunity—something that most all of us desire—an opportunity to do something meaningful and feel valued.

For Chen, working with farmers gives him a sense of self-worth. "Whether I'm working here in China or in Africa," explains Chen, "my job is about helping other people do their work better – improving their skills, increasing their yields – it doesn't really matter who I'm helping." But what does matter for Chen is how empowered he is to do that helping. And in China he feels there are limits.

He explains how lack of true land tenure in China hinders rural agriculture progress. "With only 600 square meters allocated per person, peasants have enough land to feed themselves, but not enough to develop themselves. They don't own the land, so they can't sell it, and they aren't able to buy anything bigger, so they are stuck. Until we have true reforms in this area, there's not much that can be done," says Chen. "Here in Hubei farmers appreciate our help, but in reality we can't have a big impact. In Senegal, a small change in watering technique or soil management can increase yields dramatically, so I can reach more people and work more effectively. It wouldn't take very much to develop a strong African agricultural sector."

Without any language training or explanation of Senegal's agrarian history during his time there, Chen was forced to interpret Senegal's agriculture through the lens of his experiences in China—a country feeding 22% of the world's people on only 10% of its arable land.



“Senegal has much better production conditions than China,” explains Chen, “with no winter, and three rivers full of fresh water.” To many Chinese, China’s land is seen as tired and overused, while African soil is perceived as rich and underutilised—and in need of Chinese techniques. “We have relatively little land compared to other countries but a massive population,” says Chen, “and yet we have been able to rely on our own abilities to feed ourselves. We can use this experience to help solve [other country’s] food supply problems.” This is the logic of China’s increasing support of Africa’s agriculture: introduce Chinese farming techniques to Africa, not to feed China per se, but to increase global food supply in general.

Despite the problems with the project he worked on during our first encounter in 2010, Chen is optimistic that there are better ways to engage with African agriculture. He doesn’t think that his dream of his own farm is very realistic, since accessing land for such a farm would be difficult—“And rightly so,” he adds, “since the Senegalese government needs to protect its own people and ensure we don’t take jobs away from them.” But he finds hope in a new tripartite agreement between the UN’s Food and Agriculture Organization (FAO), China and Senegal (along with eight other African Countries) for the implementation of South-South Cooperation (SSC) on food security and agricultural development.

Since returning from Senegal at the end of 2010, he’s been receiving French language training—he shows me his textbook and eagerly starts to practice with me, checking his pronunciation and asking about bits of grammar he doesn’t understand—and he’s also travelled to Rome for an FAO training on programme monitoring and evaluation.

He’s now off to Senegal for another two year posting, but this time under the trilateral FAO food security programme, and he expects this experience to be very different from the last. “The standards with this work are much higher than before,” he explains, noting that the previous project aimed to provide ‘training’ but without specifying any clear outcomes from that training. “This time our goal is defined by the Millennium Development Goals—to help Senegal address its food security problem—and covers all aspects of agriculture, not just a few new techniques and varieties. And we will be following the model of existing projects FAO has conducted elsewhere, so the methods are already tested.” Structurally, Chen also notes that the work is overseen by the Chinese Ministry of Agriculture—as opposed to the Ministry of Commerce from the previous work—which should be able to provide better leadership for the project because they “know what should and should not be done for agriculture development.”

The new language and project monitoring skills Chen returns with still do not guarantee he can avoid the kinds of communication barriers and misunderstandings that derailed his previous efforts in Senegal. “The work will be difficult,” he says, “because I will have to manage people who have a limited understanding of the local context and limited time within the country.” The preparations still haven’t included any training in Senegalese socio-cultural or agrarian history. But Chen has learnt important lessons from his previous work, and returns this time with a long-term strategy. “The team is all very specialized with extensive domestic experience [in China] – they’re all very capable in their own fields, but they have not yet been to Africa. My best option will be to develop their individual capacities.”

In the long-term, Chen envisions the Chinese helping Senegal to develop agriculture promotion centres similar to the one he works for in Hubei “to focus on capacity building for average citizens. It’s the people who need skills building if anything is going to change.” Chen explains that the Senegalese government-run training centre where he worked in 2010 had no agency to “reach the masses” with agricultural information. “It would be better,” he says, “if they developed a more comprehensive programme and had a plan for how to achieve it. Then in the future when we [Chinese] go there, we could just work for them. There’d be no need to do our own projects.”

I leave Hubei with cautious optimism. Chen’s vision of an agriculture extension system like his in Hubei—engaging smallholder farmers in cooperative experiments on low-input, ‘green’ agriculture approaches—would certainly be a best case scenario for China-Africa agricultural cooperation. In addition, the collaboration with FAO might help him and others overcome some of the communication and project management issues encountered in these exchanges.

Trilateral cooperation is touted as the answer to the rising powers and their reshaping of global development. But there is scant evidence to show that these new models offer any tangible difference for development outcomes on the ground. In addition, it’s unclear from FAO’s project design whether the Chinese technicians will

be encouraged to focus on diversified systems with smallholder farmers, as Chen hopes, or whether the aim is to apply more environmentally-destructive Chinese technocratic input-intensive agricultural models to solve African food security problems.

As Chen heads off to Dakar, only time will tell whether the planned outcomes of the FAO South-South Cooperation work in Senegal can be achieved.

But for Chen at least, it signifies another opportunity to excel at what he loves. A few days after I return home I receive a skype message from Chen thanking me for IIED materials I have sent him on integrated agricultural systems. I reply that it is I who should be thanking him, for being such a good host and helping me with my research. When we have exchanged a few more flatteries, I suggest that we are a 'model of mutual benefit', echoing the Chinese government language of its relationship with Africa. Chen replies: "Indeed, society is everyone's community. No person can do without the help of others."

Note: Chen isn't his real name – it's been changed to protect his identity.

*Source: This article was originally published on IIED's website.*

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## Food security for Africa: an urgent global challenge

By **Albert Sasson** (European Commission)

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On September 14, 2010, the Food and Agriculture Organization of the United Nations (FAO) published its estimates concerning the number of people suffering from hunger in 2010: 925 million. This figure was below the 1,020 billion in 2009, but it was higher than the number reached before the 2008 global food crisis. The 2010 figure corresponded to 13.5% of the world population, while the 2015 objective (millennium development goal (MDG) number 1) was 8%. The FAO concluded that we were still far from achieving MDG 1, that is, halving the number of hungry people worldwide by 2015.[1]

In 2010, the regional distribution of people suffering from hunger was the following: 578 million in the Asia Pacific region; 239 million in sub-Saharan Africa; 53 million in Latin America and the Caribbean; 37 million in North Africa; and 19 million in developed countries [1].

These figures were expected to increase due to another global food crisis in 2011, spurred by an important rise in commodity and food prices. According to the World Bank, another 44 million people living on less than US \$1.25 per day had fallen into extreme poverty between June and December 2010 because of the increase in food prices. Consequently, by early 2011, 1.2 billion people were in that situation. And on February 4, 2011, the FAO's Director-General, Jacques Diouf, and the French agriculture minister, Bruno Le Maire, warned during a press conference against 'a real risk of a global food crisis'. The FAO's Director-General stressed that 'not only was there a risk, but food riots had already occurred in some regions of the world because of food price increases and governments had found themselves in a difficult situation,' alluding to Tunisia and Egypt. The FAO's monthly index of global food prices, which was published on the eve of the press conference, had reached another historical peak ([2]; see also [3]).

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Olivier de Schutter, special rapporteur of the United Nations on the right to food, stated: 'If most poor countries are still very vulnerable, it is because their food security depends too much on food imports whose prices are increasingly high and volatile'. Since the 2008 food crisis, it is indeed true that volatility of food prices has become an important feature of the global situation. That is why, according to Olivier de Schutter, the international community should respond rapidly 'by adopting regulation measures and by designing a global governance of commodity and food stocks, based on a more transparent management of the stocks every country keeps'. This crucial issue of market stability was the focus of a meeting organized by the [FAO](#) on 24 September 2010. The regulation of the markets of agricultural commodities was also a key subject of the [G20](#) meeting organized by France in Paris in February 2011 [1].

Unfortunately, more action is needed rather than general statements, and international cooperation and solidarity must prevail over selfish national interests if we really want to eradicate such a global shame as the starvation and undernutrition of billions of people. For instance, the pledges made in L'Aquila (Italy) in 2008 are far from becoming a reality. During that G8 meeting, heads of states and governments made the commitment to gather US \$22 billion (€16.8 billion) over 3 years in order to struggle against food insecurity. Also at that time, all the countries present stressed the need to increase the proportion of agriculture-oriented investments in public aid for development, which fell from 17% in 1980 down to 3.8% in 2006, and thereafter rose to around 5%. All of these commitments are far from becoming a reality. A US\$900 million 'global program for food security' was announced only on April 22, 2010. It is funded by the United States, Canada, Spain, and South Korea, and the Bill and Melinda Gates Foundation also joined the program. On June 23, 2010, an amount of US \$224 million was allocated to the first five beneficiaries: Bangladesh, Haiti, Rwanda, Sierra Leone, and Togo [1].

The Bill and Melinda Gates Foundation is bringing its expertise more than funds (US\$30 million). As stressed by Bill Gates, the Foundation has accumulated unique experience while disbursing US\$1.5 billion over 4 years (2006–2009) for activities aimed at improving food security. This area of action has become, according to Bill Gates, the other global priority urgency, 'just after health'. He added that the solution was to assist small farmers 'to increase their productivity, to find outlets and to adopt new agricultural techniques'. Bill Gates is convinced that food security is more complex than aid to healthcare, because in that case, one needs the cooperation of local governments. Food insecurity often prevails where public infrastructures are corrupted and very backward. Bill Gates recognized that the endeavour is huge: out of the 1 billion people who live with US\$1 or even less per day, 75% are in rural areas; and the US\$900 million devoted to the 'global program for food security' represent the equivalent of 1 or 2 days of subsistence for every person among the extremely poor [4].

In sub-Saharan Africa, food insecurity is a major concern, as shown by the following very disturbing examples.

### **Food insecurity in sub-Saharan Africa: Examples Madagascar**

Under the threat of starvation, the populations living in the deep south of Madagascar (Malagasy) are adopting survival strategies, such as eating seeds to be sown for the following harvests and therefore reducing the likelihood of any meaningful crops. In this remote part of the country, which has been neglected by public authorities as well as by development institutions and that has been hit by a severe drought since 2008, some 720,000 inhabitants (about 40% of the population of the three regions of Atsimo-Andrefana, Androy, and Anosy) were suffering from starvation, according to the World Food Programme (WFP). The number of districts classified as 'in food difficulty' rose to 53 in 2010, compared with 31 in 2008 and 45 in 2009. 'Even those districts which were considered granaries are now hit by food insecurity,' as stressed by the representative of the WFP in Madagascar, Krystyna Bednarska [5].

In 2010, and for the second year in sequence, rainfall was below 350 mm, and the rainy period that generally starts at the beginning of November had not yet started by the end of December. In 2009 and 2010, 80% of the maize harvest had been destroyed. In addition, the provision of drinking water was even more difficult because rivers were dry. In the region of Androy, only 7% of the population had access to drinking water [5]. Food prices rose: they were 50% higher in the south of Madagascar than in the rest of the country. Households were selling their livestock, considered as their asset, but which had no value in the case of extreme drought. Leaving behind women and children, men were migrating to the north of the country, where they hoped to earn more money. In April 2011, at the peak of the intercrop season, it was forecast that some 6,700 children would suffer from severe malnutrition and would eventually die, according to the United Nations Children's Fund's ([UNICEF](#)) representative, Bruno Maes [5].

While the risks of severe malnutrition were increasing in that region, the number of cases of tuberculosis was rising, as well as women's mortality during delivery, and the healthcare system was becoming increasingly ineffective. The vaccination rate was 41% in the south of the country, compared with 88% (average) in the rest of the country. Bruno Maes stated that '87% of health centers were lacking basic medicines and 55% had no fuel to operate their refrigerators' [5]. The non-governmental association Médecins sans Frontières (Medical Doctors without Borders), which had left the country in 2005 after 18 years of presence, decided to bring back a permanent team because of the gravity of the health situation. The various donors could not cope with such a desperate situation. The WFP, which wished to raise the number of receivers of urgent assistance from 80,000 to 200,000, was seeking funds. Of the 90 health centers, 52 that UNICEF had supported over 18 months in the south of the country could close down by the end of 2010 because of lack of funds [5].

### **The Horn of Africa**

Around 12 million people were suffering from starvation in the Horn of Africa (Somalia, Ethiopia, northeastern Kenya), stricken by the worst drought in the past 60 years, announced the FAO on July 12, 2011. A few days before, the WFP had estimated that, in this region, 10 million people needed food assistance. The Secretary-General of the United Nations called an emergency meeting with all directors of the United Nations agencies and requested member states for a more generous attitude regarding their help to the countries suffering from starvation. In fact, less than half of the US\$1.6 million (€1.14 billion) needed for the assistance programme to be carried out in that region had been collected.

In northeastern Kenya, around Wajir, capital of that province, near the border with Ethiopia and Somalia, drought has been particularly severe. Trucks filled with water were brought there once a week from a neighbouring community in order to meet minimum needs for drinking water. Fifty kilometres from Wajir, in the city of Griftu, rainfall volume has been about 60% to 70% lower than the average for 1.5 years. While in October 2010, 50 children had been treated due to malnutrition, this increased to 700 in July 2011 [6]. Drought is not exceptional in the Horn of Africa, but 2011 was different: recurrent droughts were more frequent since the 2009 episode and plant regrowth was almost impossible. Nomadic cattle herders had to seek for farther pastures, sometimes several hundred kilometers away. They often left their families behind them without any resources. For other livestock herders, it was already too late: animals died from starvation, and their owners tried to sell them at a very low price before death occurred [6].

Another consequence of the very severe drought was the spike in food prices. In Wajir, the price of rice (the staple food of the local population) rose from 60 to 80 shillings (€0.64) per kilogram in 3 months, while the price of sugar doubled. The purchasing power of people has almost become nil [6].

Development associations stated that they had warned local authorities since June 2010 about the risk of a major reduction in rainfall. They said that nothing had been done, thinking that the situation would improve. Many were those who underlined the lack of investment and long-term planning by the Kenyan government for the northeast of the country. They had, nevertheless, solutions in mind: limitation of the installation of sedentary people on land traditionally used by herders; convince livestock herders to sell their animals earlier, to reduce the size of their herds and flocks so as to make them more economically viable; and advocate for a diversification of their activities. But the central government seemed to focus on short-term solutions [6].

Although not as dramatic as in northeastern Kenya, the lack of rainfall or much scarcer rains have affected the region southeast of Nairobi. Maize harvests have been drastically reduced and about 400 farmers have grown cassava instead of the usual crop; they were to reap their first harvest in 2011. Cassava needs less water than maize, as well as fewer pesticides. In order to avoid poisoning by cyanide (in the tubers), selected harmless varieties are distributed to farmers by the Kenya Agricultural Research Institute (KARI); the project is funded by the European Union. Another group of 560 farmers in the village of Mbuvo, south of Nairobi, were harvesting their first crop of cassava by the end of July 2011. They formed a cooperative in charge of collecting, weighing, washing, and peeling the tubers of cassava, before transforming them into a white powder that is dried on large wooden mats. The derived products are cassava flour, chips, animal feed, and meals made with cassava leaves. The cooperative's objective was to cultivate 300 hectares in 2012 thanks to the use of machinery, and later on, to export the products to southern Sudan, Germany, and the United Kingdom [7].

In addition to cassava, KARI has been supporting the cultivation of another traditional crop, sorghum, which is

also tolerant to drought. In 2011, about 3,000 farmers were selling their production to local brewers. Food security has become a top priority and KARI's research and extension work aimed at finding appropriate solutions in close collaboration with the farmers, particularly those working in a drought-prone environment. On July 20, 2011, 'The United Nations declared that famine existed in two regions of southern Somalia: southern Bakool and Lower Shabelle,' as stated by the United Nations Office for the Coordination of Humanitarian Affairs for Somalia. Both areas are controlled by Shebab insurgents. Famine is declared when over 30% of children suffer acute malnutrition, the mortality rate reaches two adults or four children per day per 10,000 people and the population has access to much less than 2,100 kcal of food per day. 'Across Somalia, nearly half of the population, 3.7 million people, were in crisis, of whom an estimated 2.8 million people were in the south,' the United Nations' statement read. 'Consecutive droughts have affected the country in the last few years, while the ongoing conflict has made it extremely difficult for agencies to operate and access communities in the south of the country,' it added.

The relief agency Oxfam has been urging donors to provide the US\$800 million desperately needed to help 10 million hungry people in the Horn of Africa. Of the estimated US\$1 billion needed to stave off a major humanitarian catastrophe, Oxfam stated that only around US\$200 million in new money had so far been provided. Over the 2 weeks before the United Nations' statement, the United Kingdom had pledged an estimated US\$145 million (almost 15% of what was needed), the European Union around US\$8 million, Spain nearly US\$10 million, and Germany around US\$8.5 million.

United Nations' officials warned that unless urgent action were taken, the areas afflicted by famine would expand, that is to all eight regions of southern Somalia, within 2 months, due to poor harvests and infectious disease outbreaks. Famine implied that at least 20% of households faced extreme food shortages, with limited ability to cope. Malnutrition rates in Somalia were the highest in the world, with peaks of 50% in certain areas of southern Somalia. Consequently, 'every day of delay in assistance was literally a matter of life and death for children and their families in the famine-affected areas,' said Mark Bowden, the United Nations humanitarian coordinator for Somalia.

Thousands of Somalis have fled to seek refuge in neighbouring Ethiopia and Kenya. In the latter country, they were streaming into overcrowded camps hosting some 380,000 people, more than four times their original capacity. On July 19, 2011, the United Nations refugee agency stated that death rates among refugees arriving in Ethiopia's Dolo Ado area had reached 7.4 deaths per 10,000 in June 2011, 15 times more than the baseline rate in sub-Saharan Africa.

Soaring world food prices had made matters worse. In Somalia, the cost of sorghum, the local staple, had risen 240% since October 2010. In Kenya, the price of maize had tripled. Food hoarding had been reportedly aggravating shortages, even when rain had been plentiful. Parts of Kenya had a bumper harvest, leaving non-governmental organizations (NGOs) to wonder why the government's strategic grain reserves were so low. An estimated 3.5 million Kenyans were in urgent need of food. So were 533,000 refugees in the overcrowded Dadaab camp near the border with Somalia (as of July 14, 2011).

Who is to blame? An oscillation in the climate in the form of La Niña, a cooling of the surface temperatures across the equatorial eastern-central Pacific, causing big changes in airflow and weather patterns, is likely to have contributed to the droughts. But Jane Cocking, Oxfam's humanitarian director, stated that 'this is a preventable disaster and solutions are possible'. The worst-affected areas were also the poorest in the region. Long-term investment could have made villages and towns more resilient.

### **Food quality and gender inequality**

In sub-Saharan Africa (and South Asia), a high proportion of female teenagers aged between 15 and 19 years are suffering from anaemia (the highest rate of 68% is registered in Mali) and weight insufficiency (47% in India), while male teenagers of the same age are suffering less from these ailments. This is one of the numerous disparities between the sexes revealed by UNICEF, published on February 25, 2011 and devoted to teenagers [8].

To elucidate the reasons for these disparities in the area of nutrition, an international group of researchers and nutritionists has decided to study the eating habits of more than 2,000 teenagers aged between 13 and 17 years



in the south of Ethiopia, and this independently from UNICEF. Ethiopia is one of the poorest countries in the world, where more than 50% of the population was less than 18 years old in 2009 and where 85% of teenagers were living in rural areas. Over 5 years, Tefera Belachew (University of Jimma, Ethiopia) and colleagues have interviewed families about their food habits and their health. Their study, published in January 2011, has shown that the health of boys and girls was similar in normal situations, but differed when access to healthy food becomes difficult [8].

females have been confronted with food insecurity, compared with 16% of the males. As a direct consequence, girls suffer more from general weakness and pathologies. Boys were generally fed first and received food of better quality. Pieter Van Dooren of the Institute of Tropical Medicine in Antwerp, Belgium, stated that 'in an Ethiopian family, the boy is often perceived as having a more important economic and religious role to play; people tend to believe that he will be more productive and more able to manage the household in case of crisis'. Roland Kupka, a nutritionist working for UNICEF in West Africa, also stated: 'In a context of food insecurity, the social status of women raises many problems. Men should receive the best food, while women eat leftovers, and generally food of lesser quality'. These statements underline the detrimental situation of women who play a key role in the country's economy, especially in rural areas: 45% of Ethiopia's workers who cultivate land are women [8].

### **Impact of soaring food prices**

In 2007–2008, rocketing food prices were the most obvious symptoms of the global food crisis. They have sparked riots in many countries, which, according to an executive of an important international body attending the World Economic Forum (2008) in Davos, Switzerland, generated more concern among governments than the rise in oil and petrol prices.

At the beginning of 2011, world food prices had risen above the peak they reached in 2008, driven by rising demand in developing countries and weather vagaries, including drought in Russia and Ukraine, and a dry spell in North China. That was a time when hundreds of millions of people fell into poverty, food riots were shaking governments in many developing countries, exporters were banning grain sales abroad, and agricultural lands were purchased or rented by rich grain-importing nations in poor agricultural ones [9].

This time, too, there have been export bans, food riots, panic buying, and emergency price controls, just as in 2007–2008. Fears that drought might cause havoc in the wheat harvest in China, the world's largest, have been sending shock waves through world markets. Anger over rising bread prices has played a part in the popular uprising throughout the Middle East. There are differences between the two periods, but the fact that agriculture has experienced two big price spikes in less than 4 years suggests that something serious is rattling the global food chain [9].

The World Bank has stated that the spike in food prices had pushed 44 million people into extreme poverty since June 2010. The FAO warned that Mozambique, Uganda, Mali, Niger, and Somalia were extremely vulnerable to instability because of rising prices, along with Kyrgyzstan and Tajikistan in Asia, and Haiti, Guatemala, Bolivia, and Honduras in Latin America. Misguided government policies could make matters worse, such as stockpiling of food by some countries, or agricultural export bans, which discourage investment in production.

### **Food riots**

In West Africa, in Burkina Faso (Bobo-Dioulasso), on February 20, 2008, rioters who protested against a 65% rise in the price of some foodstuffs in January burnt government buildings and looted stores. Days later, in Cameroon, a taxi drivers' strike over fuel prices became a massive protest against soaring food prices, leaving around 20 people dead, while hundreds were arrested. In Senegal, in March 2008, police in riot gear used tear gas and beat people protesting against high food prices and later raided a television station that broadcast images of the event [10,11].

In Cairo, the military was put to work baking bread as bread lines at bakeries that distribute state-subsidized bread became the scene of fights. The government feared that these fights could become the spark that ignited wider anger at a repressive government. In Yemen, food riots turned deadly, taking at least a dozen lives [10,12].

In Morocco, while trade unions warned against the degradation of consumers' purchasing power and its implications for social peace, and a newspaper requested the authorities to ensure that food prices would not exceed some 'red lines', people took to the streets at the end of September 2007 and clashed with the police in the city of Sefrou, located in the center of the country. Some 50 people were wounded and dozens of food rioters were arrested. In order to prevent a country-wide massive protest, the increase in bread price was cancelled and the state had to bear the brunt of the 25% rise in the price of a loaf of bread (1.50 dirhams, or €0.14). Further to a poor cereal harvest in 2006–2007 due to a severe drought during the spring (instead of the 90 million quintals harvested in 2005–2006, only 20 million quintals were harvested in 2006–2007), Morocco had to import large quantities of soft wheat [13].

A striking example of food riots and popular uprisings due to the increase in food prices is that of Mozambique. In Maputo, the capital, and other cities of this southern African country, on September 1, 2010, people took to the streets after the government announced a 25% to 30% increase in the price of bread for the following week. Shops and banks were looted, cars stoned, and roads barricaded with rocks and burning tyres during 3 days of rioting that paralyzed the capital and shut down the main airport. The riots left at least a dozen dead and more than 400 injured. Police said they had to resort to live ammunition against protesters after running out of rubber bullets. Nearly 300 demonstrators were arrested, including nine accused of 'incitement' for sending out mobile-phone text-messages urging people to join the protests against rising utility, transport, and food prices [14].

After having declared that the increase in bread price was 'irreversible' during an extraordinary meeting, the government called off the increase and apologized, saying it had never authorized the use of lethal force. In 2008, food riots occurred in Cameroon and Somalia, and spread through Mozambique. Inflation was endangering the life of the poorest sections of the country's population and was also exacerbating the discontent of people against the governments. The increase in the price of bread was not the only reason for rioting: the price of water rose 12% and that of electricity 13% just before the food riots, and a few months before the events the price of bread had been increased in a similar way. Finally, the government and trade unions had signed an agreement to raise by 50% the fare of collective minibuses [15].

Despite receiving billions of dollars in international aid since the end of its civil war in 1992 and having one of the world's fastest-growing economies, Mozambique remains poor and unequal. Most of its 20 million people live on less than \$1.25 a day. There is almost no state welfare. The smallest rise in the cost of living can become a question of life and death. Although the government has blamed the rise in the cost of bread on soaring global wheat prices, that was not the main factor. It had more to do with a sharp fall in the metical, Mozambique's currency (-43% compared with South Africa's rand, between January and September 2010), coupled with a poor harvest in the south of the country in 2010 due to drought. Despite vast swathes of potential farmland, only a small proportion is developed, as the country relies on imported food, mostly from its neighbour, South Africa [14].

All of these events occurred when Mozambique was welcoming investors interested in exploiting the country's vast natural resources. For instance, according to Noticias, a newspaper close to the government, China intended to invest US\$13 billion in the country. With an economic growth of about 7% in 2010, Mozambique seemed to be making good progress towards recovery from a civil war that led to about 1 million deaths between 1976 and 1992. There were, however, serious accusations of corruption at the top of the state. Some of its decisions also seemed difficult to understand: for instance, contracts were signed to extend the areas to be cultivated with jatropha (in order to produce biodiesel from its oil) while the country had serious problems of food supply [15].

The government announced an 'action plan' to cancel the rise in utility tariffs for the poorest, to reduce the price of rice and sugar, in addition to cancelling the 30% rise in bread prices forthwith. It has also promised to freeze the salaries of politicians and senior civil servants. The latest measures were to remain in force until the end of 2010. By then, the government was expected to issue a longer-term plan for economic and social stability [14].

### **Impact of climate change**

Climate change and global warming are considered major threats to agriculture and food production. In 2007, the United Nations predicted that 'zones struck by drought in sub-Saharan Africa might increase from 60 million

to 90 million hectares from now to 2060. . . and that 'the number of people suffering from malnutrition might increase up to 600 million from now to 2080'. On 1 February 2008, the journal Science published forecasts of Stanford University, California, which predicted that South Africa could lose more than 30% of its maize production from now to 2030 [16].

Catastrophic floods and severe droughts are inflicting heavy damage to sub-Saharan Africa's ecosystems and agroecosystems, threatening the lives of tens of millions of people. For instance, on August 25, 2008, the United Nations' humanitarian coordination in Chad announced that about 30,000 persons had been affected by floods in the south of the country. In Ethiopia, according to the Red Cross, 75,000 persons were severely hit by drought. It is not easy to correlate these events with climate change, but they enable the experts to forecast the dangers and threats of climate change in Africa, which produces only 5% of the world's emissions of greenhouse effect gases [17].

Amidst the debates on climate change, Africa is 'the forgotten continent', as stated by Yvo Boer, Secretary-General of the United Nations Convention on Climate Change, in Accra (Ghana), during an international conference on the follow-up to the Kyoto Protocol, which ended on August 27, 2008. According to Ghana's president, John Kufuor, Africa was already suffering from 'climate shocks': in his country, rainfall has decreased by 20% over the past 30 years. This rainfall decrease has been confirmed, on a greater scale, by German and African scientists during a symposium held in Ouagadougou (Burkina Faso) on August 26, 2008: the rainfall season in West Africa starts 30 days later than 40 years ago. According to the research programme Glawo, which was the subject of the Ouagadougou seminar, a 'considerable warming' was expected in Africa as well as a 'remarkable' reduction in rainfall in sub-Saharan Africa and along the southern rim of the Mediterranean from now to 2050. These forecasts confirm those of the Intergovernmental Group of Experts on Climate Change, published in 2007. The Group's report forecast a 5% to 8% extension of arid and semi-arid lands from now to 2080, an increase in the number of people suffering from lack of water from now to 2020, and worsening difficulties for agriculture that could halve agricultural production in some countries [17].

The elevation of sea level could also affect coastal countries such as Ghana, Nigeria, and Gambia; Stefan Cramer, of the Heinrich Boll Foundation, who attended the conference in Accra, underlined the impact that would be felt particularly in the deltas, where populations are dense. For instance, Lagos, Nigeria's economic capital, with 15 million inhabitants, would be seriously affected; several districts of the city that are situated below sea level are already regularly flooded. This overall situation is compounded by the increase in population growth and by the lack of resources. According to the United Nations Division of Population, the number of people living in Africa would rise from 922 million in 2005 to 1,998 million in 2050. While economic growth has been rather high over the past few years (6.2% in 2007, according to the Economic Report on Africa by the United Nations and the African Union), public aid from the rich countries was slumping (-8.4% in 2007, according to the Organization for Economic Cooperation and Development ([OECD](#)); [17]).

The study published on June 3, 2011 by the Consultative Group on International Agricultural Research (CGIAR) and based on a comprehensive mapping work concluded that regions where food insecurity was highest were also those where climate change was expected to drastically change farming activities. These regions are mainly located in Africa and South Asia, but China and Latin America could also be affected. In less than 40 years, the agricultural seasons of these regions will be shorter, warmer and drier, jeopardizing the life of hundreds of millions of people who are already poor or very poor. Farmers have already made efforts to adjust to climate variations through modifying the sowing periods or changing grazing lands. But the CGIAR's study underlined that the rapidity and range of climate change would most probably need more drastic adaptations. Beyond average maximum temperatures above 30°C, yields of rice and maize are affected, while the cultivation of beans becomes very difficult. Tens of millions of small farmers in sub-Saharan Africa might be confronted with such a situation by 2050 [18].

On the other hand, in a new study, the London-based charity Oxfam stated 'the international community is sleepwalking' towards a humanitarian catastrophe, as rising food prices threaten to cause a range of demographic and social crises. The report, Growing a Better Future, indicated that prices for basic staples might rise to 120% to 180% of their current levels by 2030 (Table 1), partly as a result of climate change but also because of poor distribution and unfettered speculation in commodity markets by big banks and hedge funds. The trend could be reversed, according to Oxfam, if governments improved regulation and focused on the plight of small farmers.

<b>Crop</b>	<b>Without climate change (%)</b>	<b>With climate change (%)</b>
Paddy rice	72	107
Wheat	53	82
Maize	71	126
Processed rice 34 48	34	48

**Table 1: Estimated rise in the cost of basic staples by 2030**

Can Africa cope with global climate change using the means existing under the Kyoto Protocol? It does not seem to be the case. 'The total amount of the projects funded in Africa by the Global Environment Facility (GEF) over the past 17 years was US\$378 million, while the global amount was more than US \$2.4 billion,' stated Yvo de Boer in Accra. Regarding the 'mechanism of clean development', which allows for the funding of technology projects aimed at decreasing the emissions of greenhouse- effect gases, it is spreading slowly on the continent. 'Only 2% of the relevant projects existed in Africa, compared with 45% in China, 16% in India, and 13% in Chile; an unacceptable situation,' stated Ewah Otu Eleri, who leads the International Center for Energy, Environment and Development, based in Nigeria [17].

On August 26, 2008, at a GEF meeting held in Cotonou (Benin), the French minister of ecology, Jean-Louis Borloo, made a strong plea on behalf of the French presidency of the European Union for an alliance between Europe and Africa during the negotiations on climate change. Addressing his colleagues from 14 countries of Equatorial and West Africa, he expressed his hope that 'Europe that has the historic responsibility of global warming' would review new financial flows in order to control deforestation and to develop Africa's energy resources [17].

Such a statement of Europe's goodwill was echoed at a Carbon African Forum, held in Dakar on September 3–5, 2008, and where several projects on the mechanism of clean development were to be negotiated. It should be underlined that one of the main issues of the negotiations that will lead to the follow-up to the Kyoto Protocol is the inclusion of forests and forested areas into the deal, because reducing or eliminating deforestation leads to the prevention of greenhouse-effect gas emissions. According to Brice Lalonde, the French ambassador for the negotiations on climate change, the inclusion of forests in these negotiations depends on the accuracy of measurement of their actual acreage and of their emissions. A consensus seems to be achievable, as satellite technologies and other methods are now available for measuring those emissions. A general agreement will now be necessary for the inclusion of forests in the carbon market, because one is dealing with a very important volume of greenhouse-effect gases that surpasses Europe's emissions. Regarding Africa, if a mechanism were designed to avoid deforestation, the countries of the Congo basin would benefit [17]. Another solution to deforestation carried out to clear out land for agriculture is to support agricultural intensification through the rational distribution of fertilizers; if yields of food crops are increased, farmers will not clear the forests to extend farmland acreage.

### **Inadequate food supply: The key cause of food insecurity**

#### **Demand side**

The chronically tight food supply the world is facing is driven by the cumulative effect of several well-established trends that affect global demand and supply. On the demand side, the trends include the continuing addition of 70 million people per year to the Earth's population and the desire of some 4 billion people to move up the food chain and consume livestock products. In China, for instance, annual per capita consumption of meat has risen from 20 kg to 50 kg in less than 30 years. About half of the grains produced in the world are used to feed the livestock. That is why the increases in cereal and fodder prices have a strong impact on livestock products: milk rose 80% to 200%, while poultry rose 10% [12,19].

Thus, after about 40 years of decrease in the global prices of cereals (–60%), while production has been growing, 2 years were sufficient to send prices soaring. It was not therefore possible for several developing

countries' governments to supply cheap food to their city dwellers. On the other hand, 80% of the 3 billion people surviving below the poverty threshold live in rural areas and have increasing difficulties in feeding themselves. The FAO listed over 30 countries for which the soaring price of food has been dramatic: in Africa, Burundi, Central African Republic, Chad, Côte d' Ivoire, Democratic Republic of Congo, Eritrea, Ethiopia, Ghana, Guinea-Bissau, Kenya, Lesotho, Liberia, Mauritania, Sierra Leone, Somalia, Sudan, Swaziland, Uganda, Zimbabwe; in Asia, Afghanistan, Bangladesh, Indonesia, Iraq, North Korea, Nepal, Pakistan, Sri Lanka and East Timor; in Latin America, Bolivia, Dominican Republic, Haiti, Nicaragua; in Europe, Moldova and Chechnya (Russian Federation). Of these countries, one out of three is confronted with political problems, that is civil war and/or general insecurity [20,21].

Still on the demand side, and without overestimating their impact, the use of maize to produce bioethanol in the United States has raised the annual global grain consumption [22].

### **Supply side**

On the supply side, there is not much new land to be brought under the plough unless it comes from clearing tropical forests or from clearing the Brazilian *cerrados* (savannah-like regions south of the Amazon forest). This has heavy environmental costs, for example increased rainfall run-off and soil erosion. And in many countries, prime cropland is being lost to both industrial and residential construction and to the paving of land for roads, highways, and parking lots for fast-growing automobile fleets. Now, sources of irrigation water are even more scarce than new land to plough. During the latter half of the 20th century, the world's irrigated area nearly trebled, expanding from 94 million hectares in 1950 to 276 million hectares in 2000. Since then, the irrigated area per person has been shrinking by 1% a year [12].

It is therefore obvious that the global supply of food is insufficient. As stated by Jacques Chirac, the former president of France, 'I have never ceased to fight against the freezing of production in Europe and to promote agricultural development in poor countries. . .'. 'Everybody at last realizes that humankind needs all its cropland. Food self-sufficiency is the first challenge developing countries should face and resolve' [23].

### **Food security: how to achieve it?**

Food self-sufficiency advocated in the 1970s and supported by many countries was replaced in the 1990s by the concept of food security, the objective of which is to make available all foodstuffs in sufficient quantities and with the adequate nutritional qualities, whatever is their origin, be they produced locally, imported, or donated as food aid. That is why the promoters of free trade demand the opening of countries to imports of food, considering that consumers worldwide have the right to purchase their foodstuffs at the lowest cost possible. However, in a world market dominated by large agrifood companies and by the subsidized agricultures of Western countries, agricultural and food prices have been, since 1990, on a downward trend. This meant very harsh competition for small producers from developing countries, for whom it is increasingly difficult to live from their farm activities. Their production costs are higher than for imported food, whose dumping prices discourage them from producing more [24].

In addition, the food dependence of many developing countries has increased markedly. For instance, in West Africa, rice imports have multiplied eight-fold since 1960 and those of meat have trebled in 20 years. Hard currency provided by agricultural exports from West Africa just pays for food imports, 70% of which compete with local products. Consequently, networks and coalitions of producers have been created in order to advocate and defend their right to food sovereignty. Their claims are directed to the World Trade Organization (WTO) with a view to changing the rules of world trade, and also to encourage governments to adopt agricultural policies that support local producers. On its side, the FAO, through its Voluntary Directives developed in 2004, encouraged its member states to translate the right to food in concrete terms as the right for all to be able to feed themselves in a decent way [24].

The end of the era of cheap food has coincided with growing concern about the prospects of feeding the world. By October to November 2011, the global population rose to 7 billion, and the spike in food prices has once again plunged into poverty millions of people who spend more than half their income on food. The number of those below the poverty level of US\$1.25 per day, which had been falling consistently in the 1990s, rose sharply in 2007–2008. This suggested that the world could not even feed its current population, let alone the 9 billion

expected by 2050. Adding further to these concerns is climate change, of which agriculture is both cause and victim [9].

The food crisis has produced a variety of proposed solutions. One group argues that high and volatile prices will make the task harder and that more needs to be done to boost supplies through the spread of modern farming, crop research, and food processing in poor countries. For the actors in this group (food companies, crop breeders, and international development agencies) the green revolution of the 1960s was a stunning success and needs to be followed by a second one [9].

The alternative view is sceptical of, or even downright hostile to, the modern food business. This group, influential among NGOs and some consumers' associations, focuses more on the food problems of wealthier countries, such as concerns about animal welfare and obesity. It argues that modern agriculture produces food that is tasteless, nutritionally inadequate, and environmentally disastrous. It considers that the green revolution has been a failure, or at least it has done more environmental damage and brought fewer benefits than anyone expected [9].

Feeding the world in 2050 will not be easy, and 'business as usual' will not achieve it. There are ways and means to boost yields of the main crops; despite the constraints of land and water, fertilizers and pesticides are available and although the concerns of the critics of modern agriculture may be understandable, the reaction against intensive farming is not always justified. Organic farming has a role to play and, indeed, its growth rate is important, but it cannot feed the world [9].

In 1996, the [FAO](#) estimated that the world was producing enough food to provide every woman, man, and child with 2,700 kcal each day, several hundred more than most adults are thought to need (around 2,300 kcal a day). The medical journal *The Lancet* reckoned that people needed no more than 90 g of meat a day. On average, they eat more than that, nowadays. Abhijit Banerjee of the Massachusetts Institute of Technology Department of Economics, stated 'We live in a world that is capable of feeding every person that lives on the planet. If there is a food problem, it does not look like a technical or biological one.' Therefore, why worry about producing more food? Part of the answer is prices. If output falls below demand, prices will tend to rise, even if 'excess' calories are being produced. That happened in 2007–2008, and was occurring again in 2011. Over the period 2007–2010, prices were more volatile than they had been for decades. This situation is bad for farmers (who are left not knowing how and where to invest) and worse for consumers, especially the poor, who risk suddenly being unable to afford basic food [9].

Another part of the answer is that it is hard to improve distribution and reduce poverty. The world may indeed produce masses of calories, but the food is not always where it needs to be, and biofuel policy is hard to change. Pushing up supplies may be easier than solving the distribution problems. The overall task remains a daunting one. In order to keep up with population growth, farmers will have to grow more wheat and maize over the next 40 years than was grown in the previous 500. The balance between what is consumed and what farmers produce matters a great deal [9].

Regarding consumption, which can be forecast with some accuracy, the predictable rise in the world's population, from 7 billion by the end of 2011 to just over 9 billion in 2050, is the equivalent of two extra Indias. If we include the 1 billion people who are now starving, the additional mouths to feed over the next 40 years add up to three extra Indias. It does not seem an impossible task. The increase in world population by 2050 will be around 30%, less than in the 40 years to 2010, when it rose by over 80%. Consumption of wheat, rice, and maize roughly tracks population growth, but at a higher level, so demand for them will add about a billion tons to the 2 billion produced in 2005–2007. That is much less than during the previous 40 years, when cereal production rose by 250% (*The Economist*, 2011).

In 2000, 56% of all the calories consumed in developing countries were provided by cereals and 20% by meat, dairy products, and vegetable oils. By 2050, the [FAO](#) estimates that the contribution of cereals will have dropped to 46% and that of meat, dairy, and fats will have risen to 29%. To match that soaring demand, meat production will need to increase to 470 million tons by 2050, almost double its current level. Output of soybeans (most of which are fed to livestock) will need to more than double, to 515 million tons [9].

Overall the [FAO](#) estimates that total demand for food will rise by about 70% in the 44 years from 2006 to 2050, more than twice as much as demand for cereals. But that is still less than half as much as the rise in food production in the 44 years from 1962 to 2006. So, according to the [FAO](#), producing enough food to feed the world in the next four decades should be easier than in the previous four. However, increasing food supplies by 70% in the next 40 years may prove harder than it was to raise them by 150% in the previous 40. The main



reason is that the growth in yields has been slowing down, from about 3% a year for staple crops in the 1960s to around 1% nowadays [9].

## **Another green revolution**

### **The challenges**

Agriculture must respond to the challenge of feeding 9 billion people, while protecting the environment and taking care of rural societies. It will be necessary to:

1. Eradicate hunger and ensure food security; global food needs will be three times higher in 2030 than they are nowadays. Some production factors can be increased, for example ploughing out more land (like the cerrados in Brazil), improving the access to scientific and technological progress (for instance, agrobiotechnology), more research and development.
2. Protect the environment and mitigate the impact of human activities on the environment. The threats are known: salinization of soils; increase in sea levels and catastrophic floods; desertification; loss of tropical forests and of the associated biological diversity; overexploitation of farmland and pastures; water scarcity; urbanization and large-scale engineering works.
3. Take care of rural societies. There are over 300,000 industrial megafarms and 1 billion family farms. The 4 billion human beings who make up the rural societies can alter, through their migrations, the demographic balance. The necessary increase in agricultural production must not ignore the implications for rural societies. A massive exodus from the countryside to the cities will cause enormous problems since cities, industries, and services cannot welcome rural people properly.

There must be a prospective approach to agricultural development:

1. The political process must strike an appropriate balance between peoples' right to food security and free trade without frontiers; the science and trade dynamics and the vulnerability of societies, as well as of the environment; the natural and cultural regional diversity and the trend towards the globalization of a model (after the globalization of exchanges).
2. Good practices must be identified and examples of successful agricultural development should be publicized. In other words, the agricultural models that will lead to sustainable development must be prioritized. The frequency and increased intensity of extreme climatic events, such as droughts and floods, have become additional challenges for global agriculture, which is already facing higher demand due to both population increase and new consumption habits of several developing countries. In order to respond to this challenge, the selection of drought-resistant crops is part of the solution. In December 2010, Bernard Bachelier of the Fondation pour l'agriculture et la ruralité dans le monde (FARM) published a study on the prospects of genetic improvement of crops tolerant to drought. But this is not easy: the control of genes coding for water stress and extreme temperatures is very difficult; it is much more complex to develop these kinds of plants than pesticide-resistant crop varieties. Research in this area is in its initial stages and it targets crops with high economic potential, such as maize, and to a lesser extent, rice, sorghum, or millet, which play a smaller role in global trade, but which are nevertheless essential for feeding the populations of several developing countries [2]. But improved seeds are just one element of crop systems. Farmers confronted with weather vagaries or climate change should be assisted in the improvement of irrigation systems that enable crops to improve their resistance to drought, according to Hafez Ghanem, assistant Director-General of the [FAO](#). Only 4% of agricultural lands in Africa are irrigated [2].
3. Worldwide governance must highlight sustainable agricultural development via the WTO's negotiations on agriculture (Doha round), and the impact on developing countries of subsidies aimed at supporting exports of agricultural commodities.

### **The African challenge**

Of the total of underfed people in the world, at least one-fourth live in Africa. This is the only continent where agricultural production per capita has been decreasing for the past 30 years; it is also the continent where agriculture suffered most from erroneous or inappropriate policies. Between 1970 and 1997, armed conflicts caused losses of agricultural production estimated at about US\$52 billion, that is the equivalent of 75% of the total public aid received during the same period.

Africa, where people under 15 years old represent some 45% of the whole population, will have to feed a

population that is expected to increase from 832 million in 2002 to more than 1.8 billion by 2050. The agricultural sector, which employs about 60% of the whole population, represents some 20% of the gross domestic product (GDP) and provides more than 10% of the export revenues. It should become the driving force of economic and social development. In July 2003, at their summit in Maputo, Mozambique, the heads of the states and governments of the African Union made a commitment to double the part of their domestic budgets devoted to agriculture by 2010–2011, so as to reach 10%.

By early September 2011, in Montpellier, south-east France, during the Conference on Agricultural Research for Development of the G20 (attended by the member countries of the G20, international organizations and French research bodies, including the Research for Development Institute (IRD)), Monty Jones, president of the World Agricultural Research Forum, executive director of the Africa Agricultural Research Forum, and World Food Prize 2004 Laureate, stated: 'Nowadays, 20% of Africa's population is underfed or malnourished and its population growth rate is the fastest in the world, 1.8 billion or even 2 billion people in 2050. It is therefore crucial that food production must increase: agricultural strategies should be changed as in the emerging countries, and Africa must adopt a range of strategies. In addition, the necessary infrastructures must be built in order to fit the expected growth in production. Finally, we need to build a domestic market, which was up to now small and fragmented, making it more regional and linking it better with the international markets'. M. Jones gave the example of Rwanda, which made the right decisions after the civil war and is now among the most advanced African countries in agriculture, having increased both its production and productivity, and improved the quality of life of its population. In *Sciences au Sud* (pp. 1 and 5) [25], M. Jones added that Africa's green revolution cannot be the same as that of Asia. There is not in Africa a unique solution such as the one based on rice because African staple foods are different, and technologies should be adapted to a distinct context.

Whereas the yield of irrigated agriculture is three times higher than that of rainfed agriculture, Africa only uses 4% of its available water resources for irrigation; only 7% of farmland (1.6% in sub-Saharan Africa) is irrigated. By contrast, 40% of farmland is irrigated in Asia. The recommended objective is to irrigate 14% of farmland.

An FAO special programme for food security is being implemented in 101 countries, including 42 in Africa. On November 1, 2004, US\$766 million had been collected, 67% of which was provided by domestic budgets in the developing countries. The aims are to increase the harvests of cereal, horticultural, and fruit crops through the introduction of higher-yielding varieties; to develop livestock husbandry (small animals and poultry), fisheries and aquaculture; to control insect pests and parasites of plants and animals (for example planting Bt cotton in South Africa and Burkina Faso); to improve food-safety standards so as to facilitate the access of produce to international markets; and to strengthen infrastructures that are needed for marketing products at competitive prices.

Africa has a number of assets. It has plenty of natural resources. The internal market should reach 2 billion people, while for the producers of goods and services, there are great advantages to draw from converting 250 million underfed persons into consumers with an effective purchasing power. According to an FAO study carried out between 1960 and 1990 in 110 countries, the annual GDP per capita in sub-Saharan Africa could have reached between US\$1,000 and US\$3,500 in 1990 if no malnutrition had occurred; in fact, it did not exceed US\$800.

The spike in food and oil prices (due in particular to the popular uprisings in North Africa and the Middle East) has led the World Bank and its subsidiary, International Finance Corporation (IFC), to strengthen their policy of giving a top priority to sub-Saharan Africa regarding their investments into agrifood projects. Financial commitments of the IFC in this region have risen over 8 years from US\$140 million (€100 million) in seven countries up to US\$2.4 billion in 33 countries. This amount, which included loans and participation shares, represented 19% of the investments made by the IFC to support development worldwide, via enterprises, and not via governments. Thus, the IFC has funded and advised societies which linked 13.5 million new consumers to the electricity grid and 47 million people to a mobile-phone company, and which created 161,000 jobs in 2010 [26].

Agrifood projects are a top priority for IFC. Thierry Tanoh, the IFC's vice-president since 2003, stated in this respect: 'Why would Burkina Faso, which exports its herds on hoof and loses during the journey one-fourth of the meat weight, not instead create in Ouagadougou a slaughterhouse with the required norms so as to export packaged meat in trucks?' It is true that the cold chain is not guaranteed because of the lack of electricity, a real

plague throughout the continent. The latter needs about 7,000 megaWatts (MW) more every year, while only 1,000 MW are installed. The IFC is therefore supporting studies for building dams and hydroelectric plants. In 2014, about US \$3 billion are expected to be invested in sub-Saharan Africa by the IFC, and mostly in agrifood projects that will consist of producing more staple foods and transferring them locally. This approach will not only improve the food situation, but also make foodstuffs processed in Africa more competitive regionally and globally [26].

### **Africa wants to make its green revolution**

By the late 1960s, under the auspices of the World Bank (which at that time increased by 80% the funds devoted to agriculture for 2 years), the green revolution had been a success in Asia and Latin America. But it failed in Africa. Climate vagaries and credit crunch, soil fertility and insufficient use of fertilizer, and above all, the weakness of the governments, made public administrations and their tools (such as credit organisms, stabilization bodies, training institutions, and dissemination of technologies) inefficient and often corrupted. They also were the first victims of policies of structural adjustment, carried out since the 1980s to save African states from bankruptcy [27].

The result was that, since the 1990s, agricultural and food production in sub-Saharan Africa has grown much less than that in other regions of the developing world. Between 1996 and 2005, food production rose 2.6% (compared with 3.3% in all developing countries). Of all farmland, 3.5% was irrigated (compared with 22.4% in the rest of the developing world), and fertilizer use amounted to 13.4 kg per hectare (compared with 115.2 kg per hectare). The balance of food in African countries had a deficit of more than US\$900 million in 2004, while it was in excess in Brazil by US\$15.5 billion, in Argentina by about US\$10 billion, in France by US \$5.7 billion, and in India by almost US\$4 billion [27].

According to the FAO's estimates, the number of kcal consumed per day and per capita reached an average of 2,260 in 2001–2003, that is a 0.37% increase over 10 years. For all developing countries, these figures were 2,660 and 0.49%, respectively, and 2,670 and 0.56% for the Asia Pacific region. In 2004, 64% of the African population was living in rural areas and 59% made a thin living from agriculture; 45% of this rural population had access to a source of drinking water and 6.1% to electricity [27].

The failure was obvious and since 1994, Ismail Serageldin, vice president of the World Bank, has set up a working group on agriculture foresight. This group, led by the ecologist Gordon Conway, proposed a vision for a more environmentally- friendly agriculture. This proposal was included in the Millennium Ecosystem Assessment (MEA), launched by the United Nations and involving 1,300 scientists between 2001 and 2005, and coordinated by the CGIAR. In 2005, the International Assessment of Agricultural Science and Technology for Development (IAASTD) followed suit; 800 researchers have been involved under the aegis of the United Nations and the World Bank; their work ended in 2007 [27].

Regarding Africa, at the African Green Revolution Forum, held in Accra, Ghana, at the beginning of September 2010, and where several hundreds of ministers, entrepreneurs, representatives of agricultural organizations and international bodies, bankers, and experts were present, it was stated that there was a renewed interest in agriculture. 'Since 2000, there has been more awareness of the need to support agriculture,' stated Mamadou Cissokho, honorary president of the Network of Farmers' and Agricultural Producers' Organizations of West Africa (Roppa). 'However, Africa has to recover from 25 years of structural adjustment policies and six severe droughts' [28].

In fact, in 2003, in Maputo, Mozambique, African heads of state made the commitment to devote 10% of their national budgets to agriculture. This aspect of funding agriculture is crucial, according to Monty Jones: 'When our governments do not increase funds allocated to agriculture, it implies that the support comes from external donors. But the latter cannot provide their support over more than three or four years. Consequently, a decrease in their assistance results in a significant reduction in production. That is the case for Malawi and Niger,' he explained. He went on to comment that, in his view, famine in several parts of Africa (especially in the Horn of Africa) is due above all to persistent neglect of the agricultural sector by governments. In Somalia and neighbouring regions severely affected by famine, statistics on agricultural development and investments are among the worst in Africa, for example only 1% of arable land is irrigated, compared with 7% for the whole continent [25].

In 2006, the Alliance for a Green Revolution in Africa (AGRA) had been created and its council is chaired by Kofi Annan, the former United Nations Secretary-General. In 2008, 59 governments published a report written by 800 agronomists and other researchers: the IAASTD aimed at promoting an agronomy based on ecological processes as well as the support for food crops. But what kind of agricultural policy should be effectively carried out? Some NGOs consider that AGRA is supporting a technological solution, for example through the use of genetically-modified (GM) crops, which is promoted by the Rockefeller Foundation and the Bill and Melinda Gates Foundation (the latter has invested €23 million into Monsanto's research on GM crops). AGRA's president, Namanga Ngongi, reacted by stating: 'We are working with conventional seeds, but these need to be improved. Also, the use of fertilizer is crucial: Africa uses, on average, 8 kg of fertilizer per hectare, which is very little; if this amount could be increased to 30 kg, this would change the face of agriculture' [28].

Kofi Annan, interviewed by the French newspaper *Le Monde*, also stated that improved seeds should be supplied to farmers, that agroproducts should be transformed and brought to market, or be stored for long periods. The aim is to enable farmers to meet their own needs and to sell their surplus on the market. Kofi Annan quoted the example of Mali, where researchers have developed a sorghum variety with a yield of 4 tons per hectare instead of the average of 1 ton per hectare. The government is fully committed to transforming the country's agriculture. A network of 150 stores supply seeds, fertilizers, and tools, and this saves the farmers travelling over long distances to buy the agricultural inputs they need. Kofi Annan considered that this combination of research, political will and good organization of the market should be extended, along with irrigation [28,29].

Namanga Ngongi, AGRA's president, has underlined that technological improvement was not the only factor in improving African agriculture; '. . . it is also necessary to reduce the costs of transactions, to better manage training and commercialization, to mobilize local banks; capital is not lacking, but rather experience and methods to lend money to the small farmer'. Many agronomists consider that a green revolution in Africa cannot be based on just technological improvements. Jacques Berthelot of the association *Solidarité* commented that 'The agricultural future of sub-Saharan Africa should be based on systems of agroecological production and agroforestry that do not need too many inputs.' 'During *Agro 2010*, the big international congress of the European Society of Agronomy, almost all presentations were dealing with agroecology,' confirmed Michel Griffon, deputy director of the French National Research Agency. Agroecology means the reliance on biological processes, the association of crops, trees, and livestock husbandry in agroforestry, the use of crop diversity in order to ensure better protection against pests and the development of organic fertilizers rather than chemical ones. In other words, agroecology does not just rely on the improvement of seeds and the use of fertilizers and pesticides [28].

This new approach to agricultural development has been supported by the CGIAR, which, for instance, highlighted the experience of the 'African vegetable garden', developed in Benin and Niger. It combines drip irrigation, vegetable crops, fruit trees, and the communitary sharing of costs [28]. Kofi Annan insisted on a key factor: political will. As an example, he indicated that in 2010, 11 African governments were investing 10% or more of their national budgets into agriculture. He considered that this commitment was going to be made by an ever-increasing number of countries, who realize that it is not just about meeting food-security needs, but also to create jobs and slow down rural exodus. The change in policy of the World Bank could help the movement [28].

As an illustration of the top priority that should be given to agricultural development and food security, it is worth mentioning the appeal made in November 2010 by Denis Sassou N' Guesso, president of the Republic of Congo-Brazzaville. In a country where oil contributes 90% of export revenues, agricultural activities have been neglected, while privileging a poorly diversified economy. Consequently, the Republic of Congo spent about 130 billion CFA francs (about €20 million) in 2010, that is the equivalent of all the salaries or wages paid by the state, to import the food and commodities needed to feed 4 million inhabitants [30].

This looks paradoxical because the country receives an abundant and regular rainfall, and has about 12 million hectares of arable land of which only 2% are exploited. Further to the appeal made by the Republic's president to 'win the battle for food self-sufficiency', the minister of agriculture and livestock husbandry stressed that the mindset should be changed while becoming aware of the wealth represented by agriculture. The latter should remain the top priority, had said the president [30].

The country's strategy is to support producers' organizations, to enable landlocked production areas to have an easier access to markets, to organize commercialization networks and to set up infrastructures for transforming agricultural production, storing and conserving agrifood products. Such a policy aims to achieve three objectives: increase the volume of agricultural exports, improve food security and create new jobs, and income for rural populations. According to decision-makers, the development of the agricultural sector is compounded by archaic production structures and the lack of storage facilities and transport of agrifood products to consumption markets. In fact, food crops are cultivated by small farmers using obsolete techniques with low yields in periurban areas that are rapidly shrinking because of extensive urbanization [30].

In order to obtain the expected results, the state has set up, with the help of funding institutions like the World Bank, a range of incentive programmes such as the National Food Security Programme (PNSA). The latter, with a fund of €29 million, is being carried out in partnership with the [FAO](#), and aims at intensifying the production of food crops in each village with the assistance of Vietnamese and Chinese technicians, rehabilitating rural roads, setting up commercialization and input distribution bodies. Another development tool is the Project for Agricultural Development and Rehabilitation of Rural Roads (PDARR), which has received €14.5 million and intends to enable poor rural populations to draw more substantial income from their production through the supply of technological tools, the purchase of equipment and inputs at lower prices, and the building of market infrastructures [30]. The most emblematic development project is that of agricultural villages, the concept of which is inspired from that of the Israeli kibbutz. This programme has been launched by President Sassou N' Guesso and it received €20 million. The programme is expected to significantly increase agropastoral production, for example 8 million eggs and 6 million cassava cuttings per year. Each village located in a region having competitive agroecological conditions will welcome 50 families. Every one of these families will have a house and a 2-hectare area of farmland. Collective infrastructures have also been planned: a library, a recreation area, a medical center, an electricity grid, a drinking-water supply system, and roads. 'The development of agricultural villages in Congo will shed a positive light on agriculture and is expected to reshape Congolese rural societies during the third millennium. The exploitation of the immense agricultural potential of the country is made possible by a state policy based on agricultural mechanization and the creation of a Fund for Supporting Agriculture (FSA),' commented the minister of agriculture and livestock husbandry [30].

This Fund was created in 2008 by the state and it aims to support agropastoral production and fisheries, and to assist the commercialization, storage, and transformation of all relevant products. The programme supported by the Fund consists of strengthening the institutional framework, carrying out research for the development of the relevant sectors, as well as extension activities in order to disseminate agricultural technologies and to train technicians. One of the Fund's priorities is to allocate more money to short-cycle crops such as vegetables, maize, and rice, as well as to poultry and swine husbandry. One of the successes of the Fund, with a budget of €6.7 million in 2011 (thus allowing the support of hundreds of projects), has been to involve banks that facilitate loans to farmers, especially to those who wanted to buy heavy equipment [30].

This strategy has drawn the attention of international agricultural companies that are settling in the Republic of Congo. Thus Congo Avenir, a partner of the South African AgriSA, acquired 80,000 hectares of farmland on 10 March 2011 further to an agreement signed with the Congolese government. This area will be devoted to larger-scale agropastoral activities. On the other hand, the Malaysian company Atama will develop oil-palm cultivation on 180,000 hectares with a view to producing 900,000 tons of palm-oil per year [30].

### **Fair trade and competition**

But solving the problem of African agriculture does not depend on just technology and organization. According to Mamadou Cissokho, 'The agreements of the World Trade Organization have resulted in the elimination of tariff protection at the frontiers; African countries import up to 40% of their food, and they have neither a regional nor continental market. In order to be able to develop research and to build up regional markets, locally grown food crops need protection at the countries' borders.' This viewpoint is a major divergence with those who make a strong plea for the liberalization of trade. In addition, in Europe and the United States, farmers receive subsidies from their respective governments. In Africa, this should also be the case to help farmers overcome their difficulties and later become more competitive on regional and international markets [28].

As Western countries are reluctant to dismantle their trade barriers that protect their farmers against global competition, which led to the interruption in July 2006 of the WTO's negotiations on liberalization of trade,

African states want to set up or strengthen barriers to enter their own agricultural markets. Thus, since January 1, 2006, 15 countries that are part of the Economic Community of West African States (CEDEAO) have imposed a common external tariff of 5% to 20% on imports, the highest tariffs concerned food products, thus restoring a mechanism adopted in 2000 by the French-speaking countries of the region. However, this tariff remained very low because the CEDEAO member states made the commitment to open up their markets within the framework of negotiations with their creditors, the World Bank, and the International Monetary Fund, on the alleviation of their debt. 'These countries, probably the weakest in the world, are also the most open: tariffs of 50% to 80% are imposed elsewhere.,, deplored Henri Rouillé d'Orfeuil, president of the NGO network, Coordination Sud. But here and there, some countries have taken more drastic measures in order to defend their production, such as Kenya in the case of milk, with positive results for local production and commercialization [31].

Such initiatives are contrary to free trade promoted by the WTO, which aims to help African countries to export on world markets. But 'the real access to the markets we seek for, is the access to our own national and regional markets,' stated Ndiogou Fall, president of Roppa, in December 2006. On these markets, locally produced commodities are confronted with the competition of low-cost imported products, for example rice produced in Senegal against Thai rice, or poultry against frozen chicken meat. African agriculture cannot compete with such imported products due to a number of handicaps, like weather vagaries, soil degradation, ineffective road networks, lack of a cold chain, and lack of access to information on markets. Many economists have concluded, therefore, that African agriculture needs some tariff protection in order to be able to develop and become gradually competitive. There is also a need to set up national or regional agricultural policies that entail the necessary investments, just as was done in the European Union [31].

Thus, within the framework of its unified agricultural policy, in March 2006, the West African economic and monetary union (UEMOA) created a regional agriculture development fund with a view to promoting and developing commodity chains from production to commercialization for rice, maize, poultry meat, and so on. Similarly, the African Union and the New Partnership for Africa's Development (NEPAD) had launched in 2003 a programme of agriculture development that needed investments of about US\$251 billion, while public aid to development accounted to less than US\$1 billion in 2004. The African Union, in December 2006, expressed its concerns regarding the slow progress in the implementation of the commitment made in 2003 by each member of the Union to devote at least 10% of its national budget to agriculture and rural development over 5 years [31].

In a wider framework, the countries of the region Africa-Caribbean-Pacific (ACP) had to negotiate a new trade agreement with the European Union, which wanted to revise the trade preferences granted to the ACP countries in order to align them with the rules of the WTO. This had to be achieved by the beginning of 2008. The 77 ACP countries, three-quarters of which are African countries, were concerned that such revision may change the rules of the game affording them the advantages indicated in the Lome and Cotonou agreements and concerning the export of their agricultural products: bananas, sugar, or cotton. Europeans stated that they were willing to maintain some preferential tariffs if they had an equivalent access to the ACP countries' markets; in this case, the exports were mainly industrial goods and services. The revision of the agreements was necessary because the preferential tariffs granted exceptionally by the WTO were to expire in 2008; beyond this date, it would be illegal to maintain them, and they could be the target of an attack by competitors of ACP countries, such as Latin American ones. They had already done so regarding bananas: a number of Latin American countries are big producers and exporters of bananas; a tariff is imposed on the fruits imported by the European Union countries, whereas this is not the case for bananas imported from Africa or the French Antilles [32].

### **Protection of African farmers**

An African green revolution cannot do away with the economic and political aspects mentioned above. Subsidizing African farmers and protecting them from the dumping of imported low-cost food and agricultural products are considered of crucial importance by many economists and NGOs. Thus, Bernard Njonga, in 2003, created the Citizen Association for the Defence of Collective Interests (ACDIC, Association Citoyenne de Défense des Intérêts Collectifs) in order to struggle against the imports of chickens and poultry meat. In an interview with the French newspaper *Le Monde*, he stated: 'Our domestic markets, after having been flooded by European products, are now flooded by those coming from South-East Asia and Latin America. In Cameroon, for instance, rice, tomatoes, onions, and maize are imported, while they can be grown locally. All local

production structures have been progressively abandoned. Farmers, who represent 60% of active population, are weakened, unemployment rises, and young people migrate to the cities; it is the reverse of development.' In 2004, he launched with ACDIC a 'war' against the imports of frozen chicken from Europe. These imports were threatening Cameroon's producers and were jeopardizing the national economy, as well as the health of populations. The role of ACDIC is to support and advise the organizations of producers, in order to design their production strategies. ACDIC also helps define a national agricultural policy. In 2006, ACDIC launched a campaign on food sovereignty and collected the written support of citizens for subsidies to farmers. Not only did the producers follow the NGO, but consumers did too. It was thanks to the participation of the consumers in the battle against imported frozen chicken that the latter was won [33].

Another example of assistance to the farmers as a key to agricultural development and overall economic growth is that of Mozambique. Despite an annual GDP growth of between 8% and 13% over 10 years (except in 2000 because of catastrophic floods), Mozambique remains one of the poorest countries of the world, with 54% of its population, mainly rural, living on less than US\$1 per day. President Guebuza, elected in 2004, as well as the main donors of aid, was convinced that after 20 years of structural adjustment and opening to foreign industrial investments, priority had to be given to activities and job creation in the rural environment. Access to land should remain easy for farmers, but they must also have access to local markets thanks to good roads and to loans, as well as to training and technologies that will raise production. They ought to be protected against climate risks. There were some experts who made a strong plea in favour of land privatization because this will attract investments from agroindustrial groups. Others consider that such privatization would benefit only the social and economic leadership, who could purchase the land; banks would not like to have lands as a guarantee and become landlords in case the owner went bankrupt. Therefore the risk of having idle lands would become real. They consider that, instead of privatizing land, farmers' work should be organized and facilitated through all kinds of assistance, as mentioned above [27].

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## CleanStar Mozambique: Food, fuel and forests at the bottom of the pyramid

By **Marc Gunther** (FORTUNE magazine)

10:32 AM, July 10, 2012

What on earth is Novozymes, a \$1.8-billion industrial biotechnology company headquartered in Denmark, doing in Mozambique, a poor African country (per capita income: \$440) where corruption is rampant and more than half of the government's budget comes from foreign aid?

The company says it's trying to protect forests, increase agricultural productivity, lift farmer incomes, reduce indoor air pollution and, not incidentally, make money.

In an unusual move for a big multinational company, Novozymes and a partner, a New York-based firm called CleanStar Ventures, have created a vertically-integrated, energy-and-fuel company called CleanStar Mozambique. The centerpiece of the new venture is a factory that makes clean-burning ethanol for use as a cooking fuel from cassava, a starchy food crop widely grown in Africa. The factory opened in mid-May, with a visit from Steen Riisgaard, Novozymes' CEO, who said, according to published reports: "I've seen many ethanol plants in the world and this is the smallest. But it is also the one that makes me the most proud."

CleanStar Mozambique aims to do business at the bottom of the pyramid, where the world's poor people collectively make up a big market. [See my blogpost, Beer at the bottom of the pyramid, which is also about Mozambique.] BOP, as it's known, is an appealing theory, but not one that has generated a lot of success stories since it was put forward by two academics, the late C.K. Prahalad (who wrote The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits in 2004) and Stuart Hart, a Cornell professor who co-authored the first article on the BOP with Prahalad and has since become a leading thinker on sustainability.

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The idea for CleanStar Mozambique took root after Thomas Nagy, an executive vice president of Novozymes, met the CleanStar Ventures people at a Cornell seminar organized by Hart. “We’d been looking for ways for our technology to get into the BOP market,” Nagy told me, when we spoke by phone. Novozymes is the world’s largest maker of enzymes, which are molecules that catalyze (or speed up) chemical reactions; they’re used in many industries, from detergents and toothpaste to stone-washed jeans, pulp and paper, oil and gas and biofuels. CleanStar Ventures, meanwhile, was formed by Greg Murray and Sagun Saxena, both former strategy consultants, to pursue business opportunities in emerging markets, with a focus on food and fuel.

“We founded CleanStar Ventures because a lot of groups that operate in this space have a short timeline,” Greg told me by phone. “They’re in a rush to put money in and take it out. To transform things like the dependence on charcoal for cooking in Africa, we need to take the time to really understand the issues and bring in partners.”

Cooking with charcoal is widespread in Africa, and a big problem for several reasons. First, it leads to deforestation because trees are chopped down to make wood into charcoal. Second, indoor air pollution makes people sick. Third, charcoal is expensive; prices have doubled in the last year in Maputo, the capital of Mozambique, and some charcoal is transported from more than 200 miles away, according to this story by TriplePundit’s Jen Boynton, who traveled to Mozambique with Novozymes.

The charcoal market in Mozambique alone is said to be worth \$150 million. “We think we can convert a majority of that over to our solution,” Murray said, and then expand. “As our scale increases, our production costs go down, and we can lower our prices. This is a pan-African strategy we’re trying to prove out here.”

Here’s how it works: CleanStar Mozambique works closely with farmers (about 500 and growing, no pun intended) who grow cassava as well as peas, beans, sorghum, pulses and soy, using conservation agriculture techniques. The company provides them with inputs and technical assistance, and buys their crops.

“The land that they use is basically land that today has been slashed, burned and degraded, first from the charcoal and then from unsustainable farming,” Nagy says. “We’re adding value to the farmland and increasing the agricultural capacity of that rural community.”

Some of the crop is sold as food, and the rest is processed into ethanol at the new factory, which uses enzymes from Novozymes.

Meantime, CleanStar Mozambique sells cookstoves and cooking fuel through its own shops, all in Maputo. Sagun says: “The pitch to the target customers is all about cost, usability and a better experience. It’s a direct commercial appeal.”

The company owns the entire operation. “You can do it yourself or you get taken to the cleaners,” Murray told me. “There are only a couple of trucking companies, and they’re crooks.”

“The secret in this project is not so much the technology or the farming practices but the ability to connecting the rural production capacity with the market in Maputo,” Nagy said

It’s not a simple business. To make the cooking stoves affordable—they sell for about \$30, but cost more than twice that—CleanStar Mozambique made a deal to sell carbon credits in advance to Bank of America Merrill Lynch (where the deal was handled by Abyd Karmali, the company’s carbon markets chief). It’s estimated that each cookstove reduces GHG emissions by four tons a year.

Will the venture pay off? Novozymes has generated lots of good will, but it wants more than that, Nagy said.

“This is a real business. We’re investing now but we certainly look forward to revenues and dividends,” he said. “We are cautious about calling it a victory, but we think we are onto something here that has real potential.”

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## How Climate Change Will Affect Food Security

By **Dr. David Nabarro** (United Nations)

04:05 PM, March 08, 2012

Throughout the world, poor people are becoming poorer as a result of failing food systems and changing climates. For many more, the buffer provided by regular employment and a steady income is being eroded by the worst economic recession since the Great Depression. As millions more become poor, they are vulnerable to volatility of food prices and the cost of seeds, fertilizers and other inputs needed to grow food.

We should not be misled by the recent fall in global commodity prices. The structural causes of hunger in developing countries are still there and will be dramatically aggravated by the current economic downturn: About one billion people are unable to produce or afford enough food, and this number will increase if nothing is done.

Governments and the international community are responding by feeding the hungry while seeking longer-term solutions to increase the resilience of farmers and their capacity to grow more food. At the same time, there is a growing call for better-functioning social safety nets to protect the most vulnerable.

Shocks are buffeting poor households at an ever-increasing rate: The UN System responds in ways that reflect the learning of lessons from the past.

The first lesson is that increasing hunger is a political liability. It caused food riots in 2008 and will contribute to discontent and frustration as long as it persists. As a greater number of people become uncertain about their access to food in the face of climate change, they will increasingly expect to be protected by their governments and will express frustration if they perceive that their interests are not being looked after.

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The second lesson is that a comprehensive response is essential. The UN System's High Level Task Force on the Global Food Security Crisis (HLTF) – set up in May 2008 – has brought together international agencies concerned with humanitarian action, development and trade. The Task Force's challenge is to prioritize investment in food systems that support smallholder production and markets and back them with world trading systems that respond to the interests of poor people. Specialists in food security, agriculture, trade and international law, development and emergency relief from HLTF member organizations have worked together to elaborate a Comprehensive Framework for Action: this is the basis for the UN System's collective engagement with countries and helps combine responses to both immediate and long-term needs.

The third lesson is that the response must be generated from within communities and – ideally – be led by them. This means investing in the empowerment of communities affected by uncertainty and at risk of food insecurity. It implies providing support to local, regional and central governments and facilitating their links with community organizations and the private sector. The response should tie urgent life-saving needs with long-term solutions that address structural causes of food insecurity.

The fourth lesson is that multi-stakeholder partnerships are a vital platform for resilience, confidence and empowerment. Most food in developing countries is produced by poor farmers. Because of uncertainty in energy markets and lack of clarity as to when global economic growth will resume, these farmers cannot be confident year-on-year about the costs of their inputs in the next growing season or the price of their harvest. Smallholders are the engine for recovery during the recession and now need to be linked effectively to sources of finance, technology and to markets. The goal is to increase their resilience and productivity, especially at a time when remittances to developing countries are being reduced.

The fifth lesson relates to the interconnectedness of the major global challenges. Climate change will impact food price volatility. Increases in the frequency and severity of extreme weather and climate-driven water scarcity have already affected food prices. The Intergovernmental Panel on Climate Change warns that global warming may cause agricultural production to decline by 25% by 2080, increasing the number of malnourished people by another 200 million. In addition, climate change's impact on production is expected to be negative in lower latitudes – where most developing countries are located – which are liable to be hit hard by rising seas. The need to reduce greenhouse gas emissions from agriculture will also affect food production and prices. It is clear that the era of low and stable food prices is over.

Responses to people's concerns about food security, public health, climate change or impending disasters help them prepare for a future in which the only certainty is that poor people will be those most affected by such threats. Working closely with different stakeholders, the international system – represented by the HLTF – serves as a facilitator for action and a platform for a global movement against hunger that focuses on poverty reduction through investments in smallholder agriculture. The world has sought before to make hunger history – and failed. This time, vulnerable people must be heard and their needs prioritized before our inability to help them is reflected as statistical evidence of collective failure and opportunities foregone.

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*David Nabarro was appointed as United Nations (UN) System Senior Coordinator for Avian and Human Influenza by Kofi Annan, UN Secretary General, on September 25th 2005. He has been seconded to this position, at the level of UN Assistant Secretary-General, by the World Health Organization (WHO). Prior to this move, Dr Nabarro had served for six years at the WHO headquarters in Geneva. He started in 1999 as head of the Roll Back Malaria Program, then was promoted, in 2000, to be Executive Director in the Office of the then Director-General. In 2002 he led the WHO cluster on Sustainable Development and Healthy Environments. In 2003 he was made head of the newly-created Health Action in Crisis group, and special representative of Director General Dr LEE, Jong-Wook. David Nabarro took up the post of Chief Health and Population Adviser, at the ODA headquarters in London, in 1990, and was promoted to be Director of Human Development (as well as Chief Health Adviser) in the UK Department for International Development in 1997. He stayed in this role till he moved to the WHO in 1999.*

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## Singapore's growing role in Asian food security

By **Yang Razali Kassim** (Nanyang Technological University)

10:20 AM, October 03, 2011

Singapore's approach to food security is set to undergo a fundamental rethink — from being a passive food-importer to a more active contributor to the regional and global food system. A mental map of a multi-pronged strategy, spearheaded by research and development, is emerging on Singapore's food security front that could turn old limitations into new strengths. Certain realities clearly define food security planning: Singapore is not an agricultural country, has little land to grow its own food, and is almost totally dependent on food imports. As a food importer Singapore is perpetually subject to the vagaries of external forces when it comes to feeding its own people. This picture may soon change.

The clearest indication of Singapore's food security strategy came out of the recent International Conference on Asian Food Security on 10–12 August in Singapore, initiated by the S Rajaratnam School of International Studies. Senior Parliamentary Secretary for Defence and National Development Dr Mohamad Maliki Osman spelt out how Singapore is becoming a contributing player in finding a more stable global food system in the face of volatile food prices and supplies.

There are at least four prongs in this strategy. The first, and perhaps the most important, is through research and development. Singapore will leverage its excellent infrastructure, intellectual property regime, a pro-enterprise tax structure and a financial eco-system that supports both publicly and privately funded research.

Its National Research Foundation recently awarded a US\$8.2 million grant to a joint project between the National University of Singapore, the Temasek Life Sciences Laboratory and the International Rice Research

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Institute to address pressing food concerns. These include the need to develop rice strains that can adapt to climate change, holding out potential benefits for the whole of Asia, including Singapore.

The second strategy is to turn Singapore into an agribusiness hub, where the private sector will play a key role. The Economic Development Board is encouraging big players to set up operational headquarters and trading operations, as well as engage in upstream research in Singapore. Their two research laboratories, Sygenta and Bayer CropScience, are developing 'elite' crop varieties for the region.

The third strategy is to turn Singapore's own domestic market into a 'test-lab' for urban agriculture. Singapore's highly urbanised population could be turned into an advantage by pursuing urban farming and seeking unique, urban solutions to food security. Agricultural production can be creatively brought into the city space, such as through 'rooftop farming'. Besides reducing Singapore's reliance on food imports, the success of urban farming can eventually be shared and replicated in other Asian cities.

In one pilot project on rooftop farming last year, the Agri-Food and Veterinary Authority engaged a local company, SkyGreens, to do a commercial 'vertical farming' prototype. More such projects may be pursued in future with the aim of turning Singapore into a centre for urban farming.

Singapore's potential in urban farming is attracting international attention. The Urban Agriculture Network (UAN) under the auspices of the UN Development Programme has declared Singapore as a possible world leader in some aspects of urban agriculture for their rooftop farming. New economic opportunities for Singapore could also come from two particular techniques — aeroponics (growing plants without soil and water) and aquaponics (growing plants using recycled fish waste). According to the UAN's Western Pacific branch in Australia, these two techniques could make Singapore a world leader in rooftop production of fresh vegetables, fruit and flowers as well as certain types of seafood in specially-designed containers. They would also make for a greener, cleaner cityscape that contributes less to global warming and climate change.

A fourth but no less important strategy is the shift towards greater local production of three key food items — eggs, leafy vegetables and fish. A SGD\$20 million Food Fund, launched in December 2009, is in place to incentivise farms to explore new farming technologies to ensure Singapore's food supply resilience.

Singapore's multi-pronged strategy fits in with the search for holistic solutions to solve food security issues. It dovetails at least three fronts in the global action to tackle food security: ASEAN, through the ASEAN Integrated Food Security Framework; APEC, through measures to enhance food security around the region; and the [G20](#), which aims to tackle food-price volatility through international coordination.

Singapore's overall strategy is to seek win-win partnerships locally, regionally and globally as food-security issues transcend national boundaries. By taking care of its own needs while being useful to the world, Singapore is poised to play its part in tackling the global food security problem.

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## Food Security Remains a Top Priority for African Development

By [African Development Bank \(AfDB\)](#)

04:41 PM, August 27, 2012

Food security remains an important development issue for Africa, with many countries facing high food costs and periodic food shortages due to climate change, humanitarian crises, conflict, displaced populations, poor agricultural practices and a high dependency on imported food stuffs. For this reason, food security remains a top priority on the continent's development agenda, as outlined in the quarterly Africa Food Security Brief published recently by the Chief Economist Complex of the African Development Bank.

For the first half of 2012 the food security situation on the continent was overshadowed by a food and humanitarian crisis in the Sahel region brought on by drought. This came on the heels of the famine in the Horn of Africa in 2011, when 12 million people required humanitarian assistance. While famine conditions no longer exist in Somalia, nearly one-third of the population is still unable to fully meet essential food and non-food needs.

According to the Food and Agriculture Organization of the United Nations (FAO), a drop in cereal production, combined with high food prices and civil strife, has led to increased malnutrition in several countries in West and Central Africa, where some 13 million are believed to be at risk if further action is not taken, including more than 1 million children. The escalation of armed conflict in Mali has resulted in an increase in displaced persons and a severe disruption of commodity movements, worsening the food security situation there. Desert locusts pose a further threat to agricultural production in the Sahel, particularly in Niger, Mali and Chad, while civil strife in the Central African Republic and the Democratic Republic of Congo have caused a surge of displaced people, both internally and across borders. In short, the FAO estimates that 28 of the 35 countries requiring external assistance for food are in Africa.

The African continent is faced with rapid urban expansion and the fastest growing population in the world; however, rural productivity is among the lowest in the developing world. Food security depends on functioning regional transportation networks, efficient pricing mechanisms, regional marketing and distribution networks, and sound logistics. To this end, regional infrastructure development can play a key role in improving food security in Africa, the AfDB brief asserts.

Policymakers should focus on financing and strengthening infrastructure networks that facilitate regional and international trade, and establishing food security corridors. Food is the basis of human development; therefore sustainable food security should be seen as a survival imperative.

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### ABOUT THE AUTHOR

#### **African Development Bank (AfDB)**

*The African Development Bank is the Group's parent organization. The Agreement establishing the African Development Bank was adopted and opened for signature at the Khartoum, Sudan, conference on August 4,*

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1963.

*This agreement entered into force on September 10, 1964. The Bank began effective operations on July 1, 1966. Its major role is to contribute to the economic and social progress of its regional member countries - individually and collectively.*

*As of 31 December 2011, the African Development Bank's authorized capital is subscribed to by 77 member countries made up of 53 independent African countries (regional members) and 24 non-African countries (non-regional members).*

*The institution's resources come from ordinary and special resources. Ordinary resources comprise:*

- *the subscribed shares of the authorized capital, a portion of which is subject to call in order to guarantee ADB borrowing obligations;*
- *funds received in repayment of ADB loans;*
- *funds raised through ADB borrowings on international capital markets;*
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## Diets must become sustainable say FAO

By [Food and Agriculture Organization](#)

11:46 AM, August 14, 2012

Immediate action to promote sustainable diets and food biodiversity so as to improve the health of humans and of the planet is urged in a book just published by [FAO](#) and Bioversity International.

“Regardless of the many successes of agriculture in the last three decades, it is clear that food systems, and diets, are not sustainable,” says Barbara Burlingame, Principal Officer of FAO’s Nutrition and Consumer Protection Division, in a preface to the book, *Sustainable Diets and Biodiversity*.

“While over 900 million people in the world suffer from hunger, even more – about 1.5 billion – are overweight or obese, and an estimated two billion suffer from micronutrient malnutrition including vitamin A, iron, or iodine deficiency,” Burlingame notes.

The problem of feeding the world’s growing population has so far been seen largely in terms of providing sufficient quantities of food, the book points out. But the pace of biodiversity loss and ecosystem degradation, coupled with emerging health issues related to diet, make it urgent to address the quality of agriculture and food systems. Poor diets are linked to marked increases in non-communicable diseases such as diabetes and cardio-vascular diseases across the world.

### Heavy footprints

High-input industrial agriculture and long-distance transport have made refined carbohydrates and fats affordable and available across the globe, leading to an overall simplification of diets and reliance on a limited number of energy-rich foods. But such foods lack nutrient quality and have heavy carbon and water footprints. Cheap, energy-dense foods have also come at the cost of flavour, diversity and cultural connection.

Currently just three major staple crops – corn, wheat and rice – provide 60 percent of the dietary energy from

#### Related tags

[MDGs](#), [Food](#), [Human Rights](#), [Nutrition](#)

#### Related articles

- [Partnerships for More High-Quality Food](#)
- [United Nations Conference on Sustainable Development](#)
- [Partnerships for More High-Quality Food more](#)

plant origin at global level, while, with rising incomes in developing economies, huge numbers of people are abandoning traditional plant-based foods in favour of diets rich in meat, dairy products, fats and sugar.

The book argues that modern diets and food production methods play a significant role in shrinking plant and animal genetic diversity, with 17,291 species out of 47,677 assessed by the International Union for the Conservation of Nature described as threatened with extinction.

### **Urgent need**

“There is an urgent need to change the paradigm of agricultural production in order to integrate the dimension of nutritional quality in our decisions as to what to produce and where,” writes Emile Frison, Director General of Rome-based Bioversity International.

“This requires us to move beyond the major staples and to look at the many hundreds and thousands of Neglected and Underutilized plant and animal species that mean the difference between an unsustainable and a sustainable diet.”

In Kenya, for instance, Bioversity have successfully helped reinstate a number of leafy green vegetables until recently considered as poor people's food into local diets and markets. Promotion of the traditional plants, including African night shade, cowpea and pumpkin leaves, spider plant and vine spinach, has increased demand both within households and in the market. Smallholder farmers are also benefiting.

In India, healthy cereals such as foxtail and finger millet have been reintroduced in areas where they had been abandoned due to government policies promoting cassava production for starch. Efforts are also underway to promote native Andean cereals such as quinoa and amaranth at the international level. The United Nations has declared 2013 to be the International Year of Quinoa.

### **Major effort**

“The transition of diets based on energy-dense foods high in fat and sugar is not inevitable,” writes Frison. “We must make a major effort to ensure that all people in the world will not only have adequate food but adequate nutrition to meet their needs”.

Our food systems need to undergo ‘radical transformations’ towards a more efficient use of resources and more efficiency and equity in the consumption of food and towards sustainable diets, Burlingame says.

“Sustainable diets can address the consumption of foods with lower water and carbon footprints, promote the use of food biodiversity, including traditional and local foods, with their many nutritionally rich species and varieties,” she adds. “They can also contribute to the transition to nutrition-sensitive and climate-smart agriculture and nutrition-driven food systems.”

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### ABOUT THE AUTHOR

#### ***Food and Agriculture Organization***

*As a knowledge organization, FAO creates and shares critical information about food, agriculture and natural resources in the form of global public goods. But this is not a one-way flow.*

*FAO plays a connector role, through identifying and working with different partners with established expertise, and facilitating a dialogue between those who have the knowledge and those who need it. By turning knowledge into action, FAO links the field to national, regional and global initiatives in a mutually reinforcing cycle.*

#### ***FAO's activities comprise four main areas:***

*Putting information within reach. FAO serves as a knowledge network. We use the expertise of our staff - agronomists, foresters, fisheries and livestock specialists, nutritionists, social scientists, economists, statisticians and other professionals - to collect, analyse and disseminate data that aid development. A million times a month, someone visits the FAO Internet site to consult a technical document or read about our work with farmers. We also publish hundreds of newsletters, reports and books, distribute several magazines, create numerous CD-ROMS and host dozens of electronic fora.*

*Sharing policy expertise. FAO lends its years of experience to member countries in devising agricultural policy, supporting planning, drafting effective legislation and creating national strategies to achieve rural development and hunger alleviation goals.*

*Providing a meeting place for nations. On any given day, dozens of policy-makers and experts from around the globe convene at headquarters or in our field offices to forge agreements on major food and agriculture issues. As a neutral forum, FAO provides the setting where rich and poor nations can come together to build common understanding.*

*Bringing knowledge to the field. Our breadth of knowledge is put to the test in thousands of field projects throughout the world. FAO mobilizes and manages millions of dollars provided by industrialized countries, development banks and other sources to make sure the projects achieve their goals. FAO provides the technical know-how and in a few cases is a limited source of funds. In crisis situations, we work side-by-side with the World Food Programme and other humanitarian agencies to protect rural livelihoods and help people rebuild their lives.*

### **Focus areas**

*Here are some of the areas where FAO shares its experience, expertise and knowledge to achieve results and impact on the ground:*

- *early warning of food crises*
- *detection and prevention of transboundary threats to food production, health and the environment*
- *sustainable forest management*
- *control of biosecurity risks to fisheries and aquaculture*
- *establishing global entities to cope with land and water scarcity*
- *boosting national capacity for generating and analyzing agricultural statistics*
- *global standards, implemented through national policies and legislation.*

*The views expressed in this article are the author's own and do not necessarily reflect CSR Manager's editorial policy.*

### Comments

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### **0 Comments**

<http://csr-manager.org/en/agenda/News/North-America/Diets-must-become-sustainable-say-FAO.php>





## Food Price Volatility a Growing Concern

By [World Bank](#)

03:59 PM, August 20, 2012

Given the exceptional drought in the US, current crop conditions in other grain producing regions, and the resulting increase in international food prices, the World Bank today expressed concern for the impacts of this volatility on the world's poor, who are highly vulnerable to increases in food prices.

"When food prices rise sharply, families cope by pulling their kids out of school and eating cheaper, less nutritious food, which can have catastrophic life-long effects on the social, physical, and mental well being of millions of young people," said World Bank Group President Jim Yong Kim. "The World Bank and our partners are monitoring this situation closely so we can help governments put policies in place to help people better cope."

"In the short-term, measures such as school feeding programs, conditional cash transfers, and food-for-work programs can help to ease pressure on the poor," continued Kim. "In the medium- to long-term, the world needs strong and stable policies and sustained investments in agriculture in poor countries. We cannot allow short-term food-price spikes to have damaging long-term consequences for the world's most poor and vulnerable."

Thus far, crop projections do not indicate the potential for actual shortages in the major grains; however, stocks are low, and the harvests will continue to be dependent upon global weather, which leaves prices more vulnerable to higher volatility.

Food price volatility creates unpredictability in the market and poses fundamental food security risks for consumers and governments. Volatility also discourages needed investment in agriculture for development due to increased financial risks and uncertainty for producers and traders.

### Related tags

[Food Price](#), [Human Rights](#),  
[Nutrition](#)

### Related articles

- [World Food Programme: High Food Prices - 10 Questions Answered](#)
- [Food Price Volatility a Growing Concern](#)
- [Nestle: Partnership between Nestlé and the Danish Insitute for Human Rights](#)  
[more](#)



While the prices of many food staples have risen sharply, the Bank noted that the current conditions differ from the 2008 crisis. In 2008, while other grains increased in price, rice and wheat prices rose the most, although the price fell quite substantially in 2009 due to a notable supply response by farmers seeking to benefit from higher prices. In 2012, prices have risen across all the non-rice grains - wheat, corn and soybeans:

- Wheat prices are up over 50 percent since mid-June;
- The price for corn has risen more than 45 percent since mid-June; and
- Soybeans are up almost 30 percent since the beginning of June and up almost 60 percent since the end of last year.

As recently as early June, analysts had expected price declines after the new harvests, not spikes. There had been early planting of corn and some soybeans in the United States, and the disastrous drought was unpredictable at that stage. Price increases will affect not only bread and processed food, but also animal feed and ultimately the price of the meat.

***“We cannot allow short-term food-price spikes to have damaging long-term consequences for the world’s most poor and vulnerable”***

**Jim Yong Kim, World Bank Group President**

In 2008, the price of rice more than tripled, which had a huge negative impact on the poor, especially in Asia. Although current rice prices remain at elevated levels, existing rice stocks are relatively comfortable. In addition, current prices of crude oil, fertilizers and international freight are at lower levels than in 2008, which will both ease the costs of importing food, and also the sowing and growing of next season’s crop.

The impact of the U.S. drought on global markets is exacerbated by other countries also currently suffering from weather-related production issues. Almost continuous rain is causing problems for the wheat crop in many European countries, whereas the wheat crops in Russia, Ukraine and Kazakhstan have been hit hard by a lack of rain. In India, monsoon rainfall is about 20 percent below the long-term annual average. July is the critical planting month and there may be major negative implications if rains do not pick up.

Should the current situation escalate, the World Bank Group stands ready to assist client countries through measures such as increased agriculture and agriculture-related investment, policy advice, fast-track financing, the multi-donor Global Agriculture and Food Security Program, and risk management products. We are also coordinating with UN agencies through the High-Level Task Force on the Global Food Security Crisis and with non-governmental organizations, as well as supporting the Partnership for Agricultural Market Information System (AMIS) to improve food market transparency and to help governments make informed responses to global food price spikes.

The World Bank has long cautioned that we can expect to see volatile, higher than average grain prices until at least 2015. In the poorest countries, where people spend up to two-thirds of their daily income on food, rising prices are a threat to global growth and social stability. However, higher prices can bring desperately needed income to poor farmers, enabling them to invest, increase their production and thereby become part of the global food security solution.

There are nearly one billion hungry people worldwide. More than 60 percent of the world’s hungry are women. Malnutrition contributes to infant, child and maternal illness; decreased learning capacity; lower productivity and higher mortality. One-third of all child deaths globally are attributed to under-nutrition, and up to 80 percent of our brain architecture develops during the first 1,000 days of life, making access to nutritious food critical, particularly for young children.

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ABOUT THE AUTHOR

**World Bank**

*The World Bank is a vital source of financial and technical assistance to developing countries around the world.*

*Established in 1944, the World Bank is headquartered in Washington, D.C. We have more than 9,000 employees in more than 100 offices worldwide. Six strategic themes drive the Bank's work, focusing on the poorest countries, fragile and conflict-affected states, the Arab world, middle-income countries, global public goods issues, and delivery of knowledge and learning services.*

*There are also strategies for the key areas in which we work:*

- *Thematic and sector strategies, which guide our work to reduce poverty in a specific sector or aspect of development. Each derives from a broad consultation with a wide array of stakeholders.*
- *Country assistance strategies, which identify the key areas in which we can best support a country in reducing poverty and achieving sustainable development.*

*The views expressed in this article are the author's own and do not necessarily reflect CSR Manager's editorial policy.*

## Comments

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**0 Comments**

<http://csr-manager.org/en/agenda/Human-Rights/Food-Price-Volatility-a-Growing-Concern.php>

## Beyond 2012 – The World Food Programme’s Perspective for a Future Climate Change Policy

By [World Food Programme \(WFP\)](#)

03:26 PM, May 31, 2012

Climate is a key parameter in growing food. Changes in climate pose a threat to agriculture and can lead to drastic increases in food insecurity and hunger. Climate change will affect everyone, but it has a disproportionate effect on those living in poverty in developing countries in areas where deprivation and vulnerability to climate risks and natural disasters are severe. Studies warn of a coming “global food crunch” with long-term drivers of climate change, scarcity of land and water, lack of investment in agriculture and fuel production, and rising food consumption due to population growth all combining to cause political instability.

As the world’s frontline organization in the fight against hunger, the UN World Food Programme (WFP) will be in even greater demand in helping communities that are affected by recurrent natural disasters adapt to climate change. Sophisticated and innovative tools – such as the WFP Vulnerability Analysis and Mapping, Early Warning Systems, Emergency Needs Assessments, and Weather-based Insurance – are essential adaptation instruments to anticipate the onset of natural disasters and allow for protective measures to be put in place.

Presence in and knowledge of the affected areas is key to determining disaster prevention and taking appropriate measures. WFP’s extensive deep-field presence in places where deprivation and vulnerability to climate change and natural disasters are severe gives an advantage in operationally strengthening resilience. The operational base of WFP consists of: 74 country offices and 270 sub-offices, an overall presence in 91 countries worldwide, and 10,200 employees, of which 91 percent are engaged in field operations.

WFP is prepared for climate-related shocks and emergencies. As a leader of the Global Logistics Cluster, WFP supports UN agencies in emergency preparedness and response mechanisms. WFP manages five UN Humanitarian Resource depots in Italy, Ghana, Panama, Malaysia, and Dubai for more than 30 humanitarian organizations that use this network in the various locations for storage of emergency stocks. The depots are stocked with standardized relief materials and are geared to ship essential relief supplies wherever needed within 24 to 48 hours.

The vision of an economy based on low-carbon incentives and “Green Growth” will only succeed if global partnerships and common framework agreements manage to bring adaptation in the least developed countries to the forefront. WFP has itself started to reduce its carbon footprint in its offices around the globe and to mainstream climate adaption activities into all of its programming areas. WFP will be engaging governments, the private sector, and civil society to also implement innovative solutions to reduce the impact of climate change and its effects on food security and hunger.

### Related tags

[WFP](#), [Climate Change](#)

### Related articles

- [WBCSD and IFC announce cooperation towards low carbon growth in Indian cement sector](#)
- [“1+3”: Building a responsible value chain](#)
- [A Greener Tomorrow – How Caring for Climate Signatories are Leading the Way to a Low Carbon Economy](#)  
[more](#)

This article was originally published in the Global Compact International Yearbook 2009.

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ABOUT THE AUTHOR

**World Food Programme (WFP)**

*WFP is the food aid arm of the United Nations system. Food aid is one of the many instruments that can help to promote food security, which is defined as access of all people at all times to the food needed for an active and healthy life. The policies governing the use of World Food Programme food aid must be oriented towards the objective of eradicating hunger and poverty. The ultimate objective of food aid should be the elimination of the need for food aid.*

*Targeted interventions are needed to help to improve the lives of the poorest people - people who, either permanently or during crisis periods, are unable to produce enough food or do not have the resources to otherwise obtain the food that they and their households require for active and healthy lives.*

*The views expressed in this article are the author's own and do not necessarily reflect CSR Manager's editorial policy.*

Comments

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**0 Comments**

<http://csr-manager.org/en/agenda/Dossiers/Climate-Change/Viewpoints-Copenhagen/World-Food-Programme-s-Perspective-for-a-Future-Climate-Change-Policy.php>

## Dispatches from the Food Movement

By University of Vermont Continuing Education

03:32 PM, August 16, 2012

Regional food systems that are ecologically sound, economically viable, and that encourage healthy communities were at the epicenter of conversation at the University of Vermont's first-ever food systems summit with a public conference titled "The Necessary (r)Evolution for Sustainable Food Systems Amplified," held on June 28, 2012, to a packed house and a digital audience from around the country.

The conference highlighted innovative ideas and initiatives for transforming the food system from 15 food movement experts. The event was also livestreamed. Institutions and organizations participating in the livestream included Emory University, Wilson College, Cal Poly Pomona, New England Culinary Institute, Sterling College, Vermont Fresh Network, and Chelsea Green Publishing.

Of the many takeaways from the TEDx-style event, five key points became common threads that wove together into one overarching idea: change the way you see food to understand the change that needs to take place. Those threads included:

1. **What's on Your Plate?** UVM unveiled a new illustrated video challenging viewers to see and think differently about the food they eat. In the simple story of one woman's gnawing questions about food, UVM encourages the SEED way of seeing: that means considering social, economic, environmental, and diet and health factors. Watch the [video](#).
2. **Less Vertical More Horizontal.** Vertical systems concentrate power and only benefit the few – in the food world, that's large companies. Horizontal systems reach outward, consider the human scale, and mutually beneficial relationships. Take seafood for example. Long ignored, the industry suffers the same issues, including domination by a few big companies. Thanks to organizations like the Northwest Atlantic Marine Alliance, there are now 30 community-supported fisheries in the US. Boston recently lifted its ban on fisherman selling at farmers markets.
3. **Food industry = Food insecurity.** Think about the people who make our food. Did you know that they use SNAP (the federal supplemental nutrition assistance program) at twice the rate of other US workers? That 75% of the world's poor live in rural areas? We largely turn a blind eye to labor issues. Irit Tamir of Oxfam US asked us to start looking and start changing those statistics. The Equitable Food Initiative (<http://www.equitablefood.net/>) is just one way of doing so.
4. **"It's easier to raise healthy kids, then to fix broken men."** So said Stephen Ritz, a South Bronx teacher, who with the help of an extended student and community family has grown more than 25,000 pounds of vegetables in the Bronx while generating extraordinary academic performance (Check out Green Bronx Machine at <https://www.facebook.com/green.BX.machine>). LaDonna Redmond, senior program associate at the Institute for Agriculture & Trade Policy, described that it was easier to find semiautomatic weapons in her community (in Detroit) than tomatoes. So she started growing food for her community. Transformation starts with simply planting seeds.
5. **Short term is easy; Long term is hard.** Sustainability advocates know that short-term thinking erodes the evolution of long-term change. That idea is just as relevant in the realm of food systems – and on a very human scale. Corie Pierce, a Vermont farmer, discussed the short-term trials, but long-term joys of farming. We need to invest in long-term solutions not only in our food systems, but also for our food systems advocates, rebels and change agents – the next generation. That's how we ensure long-term change and success. UVM's Breakthrough Leaders Program, a two-week program that took place

### Related tags

[Food Movement](#), [Regional Approach](#), [Nutrition](#)

### Related articles

- [Committee of Entities in the Fight against Hunger and for Life \(COEP\)](#)
- [Food security for Africa: an urgent global challenge](#)
- [Meeting the Global Water Challenge](#)  
[more](#)

around the conference is one such investment.

Near the end of the summit, Governor Peter Shumlin of Vermont, took the stage to deliver a speech in which he stated that “Our best agricultural days are ahead of us, not behind us.” The audience agreed.

*Source: University of Vermont Continuing Education*

## Comments

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**0 Comments**

<http://csr-manager.org/en/agenda/News/North-America/Dispatches-from-the-Food-Movement.php>

# CSR Manager

## Land Use Futures: Making the most of land in the 21st century

*Edited by Foresight, Government Office for Science*

*325 Pages, 2012*

*Price: -*

### About the Study

The project aimed to provide an evidence base which will support government and other policy makers in ensuring the UK's land use patterns and practices are fit for the future, including:

- An analysis of land use challenges the UK could face over the next 50 years;
- An examination of existing structures and mechanisms and their capacity to help us meet these challenges; and
- Identification of opportunities to use and manage land differently now so that UK society continues to enjoy a good quality of life in the future.

The project was conceptualised around the idea that human use and management of land interacts with natural processes and ecosystems. These biophysical, social and economic processes come together to form a "land system". Having a systemic perspective will help us to gain a better understanding of where "interventions" in the system may cause unforeseen problems and exacerbate vulnerabilities. Using systems thinking we were able to explore the future of land use in an integrated way.

#### **What types of questions did it explore?**

- What are the major global and national drivers of change?
- Is the 'land system' sufficiently resilient and flexible?
- Are there key decisions about land use which should be taken in the short term with the benefit of new insights?
- Could existing land use practices lead to unintended consequences?
- How could behaviours and attitudes towards land change?
- What developments in science and technology could affect land use?

#### **Global Food and Farming Futures project**

Foresight is also currently undertaking a Global Food and Farming Futures project which is due to report in November 2010. There are likely to be some useful synergies with the Land Use Futures project but the key differences between the two projects are:

- The Land Use Futures project specifically considers the UK whereas the Global Food and Farming Futures project is taking a global perspective on the long-term challenges of a growing world population and increasing pressures on food production.
- The Land Use Futures project considers all possible uses of land whereas the Global Food and Farming Futures project focuses on land use that directly affects the food system and also considers oceans, seas and lakes in this context.
- The Global Food and Farming Futures project will consider how policy both within the UK and more broadly, particularly internationally, can contribute to alleviating hunger and sustaining a well-fed world in the future.

*Source: All information was taken from the Website & the Publication.*

## Table of Content

Executive summary

1 Introduction

2 Current patterns of land use and historical drivers of land use change

3 The value of land and the framework for land use decisions

4 Major land use sectors – past and future: part I

4.1 Land for water resource management

4.2 Land use for conservation

4.3 Agriculture

4.4 Land for woodlands and forestry

4.5 Land for managing flood risk

5 Major land use sectors – past and future: part II

5.1 Energy production

5.2 Residential and commercial development

5.3 Land for transport infrastructure

5.4 Land for recreation

6 A geographical perspective

7 Achieving sustainable land use

8 Conclusions – next steps

Appendices and references

Appendix A: Acknowledgements

Appendix B: Evidence reviews and other project documents

Appendix C: Glossary of terms and acronyms

Appendix D: List of important research, futures projects, and government initiatives drawn upon during the Project

Appendix E: Scenarios

Appendix F: Definitions of land use – urban and rural

References

*Source: All information was taken from the Website & the Publication.*

## Research Team

Foresight projects involve leading experts from the widest scientific and other disciplines in order to ensure that our work is of the highest technical and scientific standard.

A Lead Expert Group worked with Foresight to ensure Land Use Futures included the most relevant evidence and its findings are of a high technical and scientific standard.

Professor David Newbery - Chair (Professor of Economics, Cambridge University),

Professor Marcial Echenique OBE (Professor of Land Use and Transport Studies, Cambridge University),

Professor John Goddard OBE (Professor of Regional Development Studies Newcastle University),

Professor Louise Heathwaite (Director of the Centre for Sustainable Water Management, Lancaster Environment Centre, Lancaster University),

Professor Joe Morris (Head of Natural Resources Management Centre, Cranfield University),

Professor Carys Swanwick (Professor of Landscape, Sheffield University),

Professor Mark Tewdwr-Jones (Professor of Spatial Planning and Governance, UCL).

*Source: All information was taken from the Website & the Publication.*

[Download the Study](#)



# CSR Manager

## Global Food and Farming Futures

*Edited by Foresight, Government Office for Science*

*211 Pages, 2012*

*Price: -*

### About the Study

The Foresight project Global Food and Farming Futures explores the increasing pressures on the global food system between now and 2050. The Report highlights the decisions that policy makers need to take today, and in the years ahead, to ensure that a global population rising to nine billion or more can be fed sustainably and equitably.

The Foresight report makes a compelling case for urgent action to redesign the global food system to meet the challenge of feeding the world over the next 40 years.

The Project analysed five key challenges for the future:

- A. Balancing future demand and supply sustainably – to ensure that food supplies are affordable.
- B. Ensuring that there is adequate stability in food prices – and protecting the most vulnerable from the volatility that does occur.
- C. Achieving global access to food and ending hunger - this recognises that producing enough food in the world so that everyone can potentially be fed is not the same thing as ensuring food security for all.
- D. Managing the contribution of the food system to the mitigation of climate change.
- E. Maintaining biodiversity and ecosystem services while feeding the world.

The Project has involved around 400 leading experts and stakeholders from about 35 countries across the world. Drawing upon over 100 peer-reviewed evidence paper commissioned by the Project which can be accessed in full.

The Project was sponsored by the UK Government's Department for Environment, Food and Rural Affairs (Defra) and Department for International Development (DFID).

*Source: All information was taken from the Website & the Publication.*

### Table of Content

1. Introduction
2. Important drivers of change affecting the food system
3. Challenge A: Balancing future demand and supply sustainably
4. Challenge B: Addressing the threat of future volatility in the food system
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7. Challenge E: Maintaining biodiversity and ecosystem services while feeding the world
8. Priorities for action
9. Why action is needed now
10. Conclusion
11. Annex: Project reports and papers

*Source: All information was taken from the Website & the Publication.*

## Research Team

Professor Charles Godfray CBE FRS - Chair (Hope Professor at Oxford University, Trustee of the Royal Botanic Gardens at Kew, President of the British Ecological Society and Fellow of the Royal Society),

Professor Ian Crute CBE (Chief Scientist at the Agriculture and Horticulture Development Board, Ex-Director of Rothamsted Research and Chairman of the Sainsbury Laboratory Council.)

Professor Lawrence Haddad (Director of the Institute of Development Studies (IDS) and Professor of Development at the University of Sussex),

Dr David Lawrence (Ex-Head of Research and Development at Syngenta),

Professor Jules Pretty OBE (Professor of Environment & Society at the University of Essex),

Professor Sherman Robinson (Professor of Economics at the University of Sussex and on the Globalisation team at the Institute of Development Studies),

Dr Camilla Toulmin (Director of the International Institute for Environment and Development (IIED)),

Professor James Muir (University of Stirling).

*Source: All information was taken from the Website & the Publication.*

[Download the Study](#)



## Partnerships for More High-Quality Food

By [Dr. Wolfgang Große-Entrup](#) (Bayer Group), [Bayer Group](#)

02:56 PM, March 16, 2012

Safeguarding food supplies for a constantly growing world population will be among the most pressing problems of the future. Bayer is providing an innovative solution with the program “food chain partnership.” This business model supports the United Nations Millennium Development Goal of fighting poverty and hunger throughout the world and contributes to sustainable development.

The situation is alarming. Studies undertaken by the United Nations forecast that the world’s population will increase by three billion between today and 2050. All these people will require sufficient and affordable food. This is reason enough to begin reacting already today. With our “food chain partnership” program for vegetables and fruits and further crops, we help to enable farmers worldwide to raise agricultural yields, increase food quality, and improve their income situation.

### The food chain partnership concept

Experts from our Bayer CropScience (BCS) subgroup advise mainly fruit and vegetable farmers on all matters from seeding to harvesting. The BCS professionals teach the farmers about sustainable cultivation in keeping with good agricultural practice.

This also includes the controlled, environmentally friendly use of crop protection agents. High-quality seed, improved treatment plans, and consistent monitoring of pest infestation increase not only agricultural yields, but also in particular the quality of vegetables and fruits.

An important aspect is that the farmers document every single cultivation step and each crop protection measure. Ultimately, monitoring and transparency benefit the entire supply chain: Exporters, importers, and traders can be sure that the produce was grown properly and that they are buying and selling products of the highest quality. For their part, consumers can assume they are purchasing high-quality fruits and vegetables.

#### Related tags

[Food Chain Partnership](#),  
[Development](#), [Nutrition](#)

#### Related articles

- [Partnerships for More High-Quality Food](#)
- [Partnerships for More High-Quality Food](#)
- [The times they are a-changing more](#)

The producing farmers see their livelihoods become more secure, as the integrated measures significantly increase their net incomes.

### **Pioneering lighthouse project in India**

As one of the lighthouse projects of our Sustainable Development Program, the food chain partnership project focusing on vegetables in India plays a pioneering role in safeguarding food supplies. To date, Indian food chain partnership projects have been organized in about 100 planting regions, accounting for 30,000 hectares of field area. A total of 40,000 farmers participated directly in the program in 2010. The relevant vegetables are okra, chili, tomatoes, eggplants, potatoes, and cucumbers. It is planned to further increase the area of cultivated land and expand the program to include additional regions by the end of 2011.

The activities are a response to rising quality demands on the part of consumers. After all, as in many other emerging countries, the standard of living is also increasing in India. Many people are buying more food, which they want to be fresh, healthy, and affordable. Furthermore, the processing industry and the export trade are also placing higher demands on food in terms of quality. The example of 27-year-old farmer Ashishkumar Patel shows how a food chain partnership works in practice. Patel cultivates some 2.4 hectares in the village of Chandrala in Gujarat state on India's western coast. In addition to cotton and eggplants, he mainly grows okra, which is among the most popular foodstuffs in India.

Our experts from Bayer CropScience advised him to plant a new okra variety that perfectly fits the requirements of the Indian food industry – and it is of such high quality that it can be exported as well. Our teams then regularly visited his fields and offered him advice and practical support, especially with regard to pest control.

## Key Facts

Initiator	<u>Bayer CropScience</u>
Project start	2009
Status	active
Region	Worldwide
Contact person	<u>Dr. Wolfgang Große-Entrup</u>
Awards	-

### **Project benefit**

- bring together farmers, suppliers, dealers and exporters in food chain partnerships
- experts support farmers in cultivating vegetables in compliance with the rules of good agricultural practice based on high-quality seed, modern crop protection agents and systematic monitoring
- harvest is protected and can in many cases be increased; quality is improved; farmers work more profitably, have access to new markets, their net income increases
- Suppliers, dealers, processors and consumers get the produce they want

## Main Issue

Anti-Corruption	-
Business & Peace	-
Development	-
Environment	-
Financial Markets	-

Implementing UNGC Principles in your Corporate CSR Management	-
Human Rights	X
Labour Standards	-
Local Networks	X

## Project Type

Advocacy of global issues	-
Business opportunities in low income communities/countries	X
Project funding	-
Provision of goods	-
Provision of services/personal	X
Standards and guidelines development	-

## Partner

- [German developmental aid organization GIZ \(Deutsche Gesellschaft für internationale Zusammenarbeit GmbH\)](#)
- Equity Bank of Kenya

The effects were already noticeable after less than a year: The farmer's okra yields alone rose from 4.2 to 6 metric tons. Moreover, he was able to achieve better prices due to the increased quality of his crops. As a result, his net income rose by 40 percent. This stands as one of many examples.

Yet it is not only farmers who benefit from this arrangement. What makes the food chain partnership concept special is that all partners along the food chain benefit from it – from farmers and traders to sellers and consumers, and over the long term Bayer as well. In the state of Gujarat, for example, one of the food chain project's steady partners is a supermarket chain. The goods grown by Ashishkumar Patel and other farmers are sold in its shops.

### Supporting the Millennium Development Goals



**Farmers in India can increase yields significantly with a combination of modern seeds, plant protection and good agricultural practices.**  
**Photo: Bayer CropScience**

With concepts such as the food chain partnership projects, we are actively helping to realize the United Nations Millennium Development Goal of fighting hunger and poverty and providing a growing world population with sufficient food quantities. The radius of action here goes far beyond India.

This is also evident in the "Green World" project launched in Kenya in 2006. With a surface area of 582,000 square km, this East African country is about the size of France. Among its more than 30 million inhabitants are a small number of large-scale farmers with significant land holdings, as well as about five million small farmers. These growers subsist on the production of the most important export crops – coffee, tea, and flowers – as well as increasingly on the cultivation of vegetables such as

sugar peas, beans, and corn cobs, or bananas, pineapples, coconuts, and other exotic fruits.

Most of these farmers are not familiar with modern cultivation methods. There is a lack of awareness about environmental issues and knowledge about the safe use of crop protection agents. The improper use of unregistered products is a major problem, as are counterfeit substances and the use of low-quality products.

Only 20 percent of Kenya's surface area is suitable for agricultural cultivation. It is thus all the more important for small farmers to be able to optimally cultivate their plots of land while at the same time meeting the rising demands placed on food safety in the most important export markets of Europe.

### **Cooperation with development aid organizations**

Many of these farmers have already taken a big step toward this goal by participating in the Green World project. We have joined together in a public-private partnership with the German developmental aid organization GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH).

Specifically, about 100 selected businesses in Kenya's villages have already been transformed into what are known as "Green World Shops." The owners have received comprehensive training in good agricultural practice and the responsible use of crop protection agents, and are themselves offering training measures for small farmers. At the same time, GIZ has also launched a special training program for farmers.

Included in the project are seed producers, exporters, and the national agriculture ministry, among other players. Furthermore, Equity Bank of Kenya grants microloans to the farmers, thus enabling them to purchase seed, fertilizer, and crop protection agents.

The objective of all these efforts is to produce high-quality, safe food. As in India, the focus is not just on successful export business, but also on improving the living conditions of farmers – who benefit from higher yields, improved quality, and better prices. Another goal is to maintain the village structures that are of importance to people's lives.

Bayer is engaged in 250 food chain partnership projects worldwide, for example in southern Europe, South Africa, Latin America, and Asia. Projects primarily involve the cultivation of fruit and vegetable varieties. However, Bayer still wants to do more. In the coming years the company aims to further drive forward the food chain partnerships worldwide. Existing projects are being expanded and new projects initiated with food industry partners. For consumers around the world, this means more high-quality and affordable food.

### **Global Sustainable Development Program**

For Bayer, sustainability means ensuring future viability. It is therefore firmly established in our core business. Food chain partnerships are thus a key element of the Bayer Sustainable Development Program launched at the end of 2009. With this program, Bayer is responding to global challenges including not just food safety, but also healthcare, climate protection, and resource efficiency. As a research-based enterprise, we want to contribute to tackling these challenges successfully. We want to take on responsibility for the world of tomorrow – a world that will change significantly.



**Tomatoes are one of the many vegetable species in Food Chain Partnerships. Photo: Bayer CropScience**





## Bayer CropScience - Food Chain Partnership

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### ABOUT THE AUTHORS

#### **Große-Entrup, Wolfgang**

*Dr. Wolfgang Grosse Entrup is Head of Environment and Sustainability of Bayer AG. Since 2007, he is responsible for global management of group activities in these areas. He reports directly to the Group Management Board. Dr. Grosse Entrup is both Chairman of the German Federal Commission on Environmental Policy of the Economic Council and the board of management of the German econsense-Forum.*

#### **Bayer Group**



#### **About Bayer**

*Bayer is a global enterprise with core competencies in the fields of health care, nutrition and high-tech materials. The company's products and services are designed to benefit people and improve their quality of life. At the same time Bayer creates value through innovation, growth and high earning power.*

*The Group is committed to the principles of sustainable development and to its role as a socially and ethically responsible corporate citizen. Economy, ecology and social responsibility are corporate policy objectives of equal rank. In fiscal 2011, Bayer employed 111,800 people and had sales of €36.5 billion. Capital expenditures amounted to €1.7 billion, R&D expenses to €2.9 billion.*

*The views expressed in this article are the author's own and do not necessarily reflect CSR Manager's editorial policy.*

### Comments

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## Good Agricultural Social Practice for Fruit and Vegetable Farming

By [Emma Arvidsson](#) (Coop)

02:20 PM, April 18, 2012

Corporate social responsibility has become an emerging issue in global food supply chains. Partners involved in the food sector are challenged to find innovative and meaningful approaches to ensure that their agricultural products are produced in line with internationally agreed labor requirements such as the UN Global Compact Principles.

Millions of rural workers worldwide, among them seasonal and migrant workers, are active in agricultural production processes. Lacking viable economic alternatives, workers in many cases agree to work in poor social and depreciative conditions. Improving working conditions of farm workers is on the agenda of various actors and has presented itself as a complex area. Differing from the often precarious situation of rural workers on farms producing for the mainstream market, numerous social standards, private guidelines, and labels have emerged to address and improve the situation on farms, providing for niche markets. Examples are the Fairtrade label and other organic labels. Farmers producing for such markets often have to carry the burden of multiple checks though different initiatives, but on very similar topics. So far, there are very few approaches trying to bridge the gap between full social audits for a limited market and mainstream agricultural production.

### Related tags

[Agricultural](#), [Labour Standards](#), [Nutrition](#), [Procurement/Supply Chain](#)

### Related articles

- [For You, for Us – Carrefour Commits Itself](#)
- [Lead by Example](#)
- [FIT5 - Factory Improvement Training in China](#)
- [more](#)

### Key Facts

Initiator	<a href="#">Coop</a>
Project start	2005



Status	completed 2008
Region	worldwide, focus on Spain and Marocco
Contact person	<u>Arvidsson, Emma</u>
Awards	-

### Project benefit

- > implementing social standards in agriculture
- > ensure that agricultural products are produced in line with internationally agreed labor requirements such as the UN Global Compact Principles

## Main Issue

Anti-Corruption	-
Business & Peace	-
Development	-
Environment	-
Financial Markets	-
Implementing UNGC Principles in your Corporate CSR Management	-
Human Rights	-
Labour Standards	X
Local Networks	-

## Project Type

Advocacy of global issues	-
Business opportunities in low income communities/countries	-
Project funding	-
Provision of goods	-
Provision of services/personal	-
Standards and guidelines development	X

## Partner

- > GlobalGAP
- > GIZ

Perceiving this need for action, GLOBALG.A.P., the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ – former GTZ) on behalf of the German Federal Ministry for Economic Cooperation and Development, and Coop Cooperative initiated the GRASP project in June 2005 as a tripartite development partnership within the program develoPPP.de. The abbreviation GRASP stands for Good Risk-based Agricultural Social Practice. The aim was to develop an approach covering basic social criteria, applicable to all agricultural production systems and different farm sizes. In the first phase, completed in 2007, a module consisting of 14 criteria for good social practice in agriculture was developed and discussed in stakeholder workshops.

Over 30 test audits were performed in five countries



**Photo: Heiner H. Schmitt/COOP**

and the first implementation tools were created. By using synergies with the GLOBALG.A.P. auditing system, assessment costs could be kept low, which made the module affordable to the mainstream production. The GRASP module – a tool to support farmers in helping them to demonstrate their compliance with international as well as national labor legislation – was introduced as a voluntary module to be audited in the framework of a normal GLOBALG.A.P. audit. The GRASP Assessments do not offer complete social audits with in-depth

investigations, but rather focus on the review of an implemented social management system. For its successful implementation, farmers are supported with guidelines providing background information and practical examples.

In the second project phase, additional retailers were involved in further developing GRASP. The purpose of this phase was primarily to adapt GRASP to local conditions, train the auditors, help more producers with implementation and, lastly, assess the value of GRASP. Local experts and NGOs were also involved in this phase. Using a range of methods, Coop raised awareness of social requirements among its suppliers in selected risk regions and then trained them to implement the requirements. The Almería region in southern Spain is a major sourcing region for fresh fruit and vegetables for Coop and other retailers participating in the GRASP project. Therefore, the vegetable suppliers of the region were the first to be audited for compliance with GRASP requirements at the end of 2008.

In the last years, cooperation with the BSCI (Business Social Compliance Initiative) has been stepped up. Coop has played a key role in ensuring that the experience gained in manufacturing and non-food is successfully integrated into the agricultural sector with the help of the primary production module. With GRASP and the BSCI's primary production module, two instruments are now available for implementing social standards in agriculture, resulting in a marked improvement in awareness among facility managers.

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#### ABOUT THE AUTHOR

**Arvidsson, Emma**

*Emma Arvidsson is CSR project manager at Coop.*

*The views expressed in this article are the author's own and do not necessarily reflect CSR Manager's editorial policy.*

#### Comments

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## FDS™: A Small-Scale Farming Revolution

By [Netafim](#)

03:33 PM, August 29, 2012

Hundreds of millions of smallholders are struggling to survive from subsistence farming in developing countries across South America, Asia, and Africa. Given the lack of water infrastructure throughout these and other areas, there is a critical need to make the most of the limited available water sources in such regions. In response, OECD countries, international donors, and NGOs have been promoting technologies such as drip irrigation, which optimizes resources, enhances global food security, and promotes sustainable productivity.

As the global pioneer in drip irrigation, Netafim introduced Family Drip System™ (FDS) in the early 2000s. Suitable for small plots (250 - 1,000 m<sup>2</sup>), FDS is targeted to smallholders, who constitute over half of the world's rural poor yet produce about 80 percent of the food supplied in developing countries, according to [FAO](#) sources. A unique, gravity-based system requiring no electricity or energy source, FDS is revolutionizing small-scale family farming. Maximizing high-quality yields with existing resources, FDS enables smallholders to increase productivity and achieve self-sufficiency.

### Related tags

[Netafim](#), [Added Value](#), [Business Ethics](#), [Corporate Citizenship](#), [Development](#), [Desertification](#), [Nutrition](#), [Poverty Eradication](#), [Resources Efficiency](#), [Water](#)

### Related articles

- [Fairtrade International \(FLO\)](#)
- [Cotton made in Africa \(CmiA\)](#)
- [Meeting the Global Water Challenge](#)  
[more](#)

## Key Facts

Initiator	Netafim
Project start	2012
Status	ongoing

Region	worldwide
Contact person	
Awards	

### Project benefit

- Inexpensive drip irrigation solutions for underdeveloped rural areas.
- Help for farmers to increase their income.
- Reduced water consumption in dry regions.

## Main Issue

Anti-Corruption	-
Business & Peace	-
Development	X
Environment	-
Financial Markets	-
Implementing UNGC Principles in your Corporate CSR Management	-
Human Rights	-
Labour Standards	-
Local Networks	-

## Project Type

Advocacy of global issues	-
Business opportunities in low income communities/countries	-
Project funding	-
Provision of goods	X
Provision of services/personal	X
Standards and guidelines development	-

## Partner

- Ministry of National Integration, Brazil
- CODEVASF(Company for the Development of the Sao Francisco Valley, Brazil)
- Bharti Walmart
- Friends of Kitui

Supporting Global Compact Principles, the user-friendly FDS is accompanied by capacity-building tools including cropgrowing and farm-management planning, training, and knowledge-transfer services. In addition, FDS is available with an optional “training-the-trainer” package focusing on drip irrigation, best agricultural practices, and capacity building. FDS is also an environmentallyfriendly solution that prevents water runoff, deep percolation, leaching, and soil erosion, while significantly lowering energy reliance and consumption.

Much more than just technology transfer, FDS represents a paradigm shift by helping subsistence farmers build up their agribusiness capabilities and become commercial farmers. Based on its experience, Netafim recognizes that training and knowledge transfer are key success factors for making a substantive change. With thousands of successful deployments across the globe, FDS delivers benefits to farming families, their

communities, and the world at large.

## Best Practices

### 1. Modern irrigation returns to the land of the Incas

Over 700 years ago, the Incas developed an irrigation system by artificially watering their plantations via terraced buildings in which their food grew. Historians studying human evolution cite this method as the source for water being considered fundamental in agricultural management and operation.



Photo: Netafim

As part of an Ecuadorian government assistance program, Netafim installed 850 FDS units in the country's Andean highlands – the same area where the Incas developed their groundbreaking irrigation method. The project gives indigenous communities in these areas the opportunity to grow their own basic food more efficiently and safely. These communities also have more time to engage in other activities, enabling them to earn extra income. At the same time, mothers can better manage their day, and, as a result, invest more quality time in educating and bringing up their children.

Netafim is proud to be contributing to the social development, health, and welfare of communities that are continuing the Incas' tradition.

### 2. Partnering in Brazil

Netafim introduced FDS to small-scale Brazilian growers suffering from low levels of food productivity and subsistence. In partnership with Brazil's Ministry of National Integration and CODEVASF (Company for the Development of the Sao Francisco Valley), a local government development company, Netafim installed a pilot project in the northeastern state of Piauí, a poor region with low amounts of rainfall.

Based on the pilot's success, the local government acquired 75 FDS kits and assisted families in implementing the system. In less than a year after the project was launched, growers successfully harvested squash, watermelon, bananas, and eggplant. Meanwhile, CODEVASF recently purchased over 1,000 kits and has begun distributing them to neighboring municipalities.

The project provides growers with food security – while not having to depend on rain – high food productivity, and savings in water and energy, which is a very scarce resource in the region. As a result of the project, the Irrigators Agriculture Association was established, enabling participating growers to share their know-how and experiences.

## Into Africa

In addition to carrying out FDS projects throughout South America and Asia, Netafim is deploying the breakthrough system across Africa. One example is a recently launched project in Kitui in Kenya's semiarid Eastern Province. Based on a partnership among the government, NGOs, and the private sector, the project is targeting 200 poor, small-scale crop growers – primarily women and elderly individuals who were selected by the local NGO Agrosphere.

The results of the project after its first season were quite significant:

- > 40 percent increase in yield
- > 200 percent increase in income
- > increase in crop-growing capacity and know-how
- > increase in basic farm management know-how
- > 60 percent savings in water (due to moving away from bucket irrigation)

To find out more about the Kitui project, please go to: [www.youtube.com/watch?v=cmqyD\\_TjrEA](http://www.youtube.com/watch?v=cmqyD_TjrEA)

### 3. An Indian enterprise

Netafim entered into an agreement with Bharti Walmart, a joint venture between Bharti Enterprises and Walmart, whereby Netafim will provide water conservation and sustainable food production training to 40,000 farmers throughout India. Launched in 2012, the project involves installation of Community Irrigation systems (FDS version in India) and greenhouse systems in model farms and six training centers across India as part of the Bharti Walmart Direct Farmer Initiative.

The three-year project aims to drive sustainable agriculture, enhance agri-input spending efficiency, reduce intermediation and waste, and move farmers up the value chain, while increasing their income by at least 20 percent.

#### Best of both worlds

These and other FDS projects serve two main purposes – improving the welfare of smallholders and achieving sustainable productivity. And the results have been successful on both fronts.

When it comes to enhancing smallholders' welfare, FDS increases productivity, improves yields, and positively impacts on individual farmers and their region. At the same time, FDS empowers women – who are often responsible for fetching water and farming family plots in poor regions worldwide – by teaching them advanced farming practices that help enhance their lives.



Photo: Netafim

And when it comes to achieving sustainable productivity, FDS is an energy-independent, environmentally-friendly solution that optimizes available water and arable land resources. Addressing the point where many of the world's challenges meet – water scarcity and aquifer depletion, arable land reduction and soil erosion, and energy constraints – FDS is successfully promoting Global Compact Principles worldwide.

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#### ABOUT THE AUTHOR

##### **Netafim**

*Netafim is the global leader in smart drip and micro-irrigation solutions for a sustainable future. Since introducing the world's first drip irrigation solutions in 1965, we have led the way by developing products that help our customers optimize results.*

*The views expressed in this article are the author's own and do not necessarily reflect CSR Manager's editorial policy.*

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