Agriculture

A Catalyst for Shifting to a Green Economy

A UNEP Brief

Context

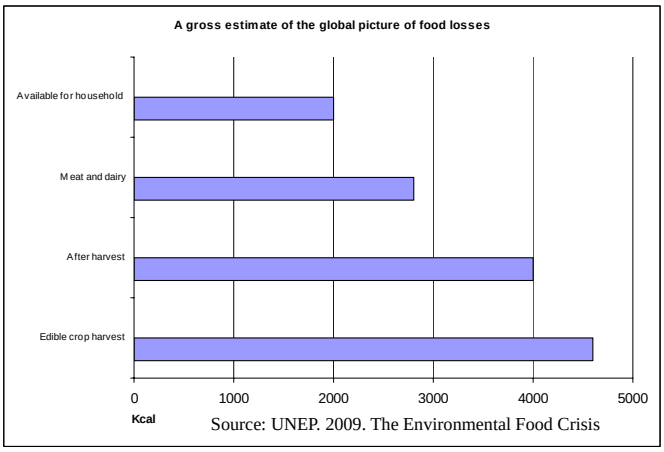
The world is in the grip of multiple economic, social and environmental crises. In 2009, between 53 and 100 million more people could fall into the US$2-a-day poverty trap as a direct result of the global financial crisis[1] and if economies continue to deteriorate, formal unemployment around the world could increase by up to 50 million from 2007 levels.[2] In 2008, almost 100 million people needed help from the World Food Programme,[3] while 57% of the potential edible crop harvest was lost during different stages of conversion from crop to food or as food waste[4]. Food losses and food waste affect supply and demand ratio and contribute to food prices which are expected to remain high[5]; a factor that limits access of the poor to food. After reaching record levels,[6] oil prices fell by over 60 per cent in 2008, but are once again on an upward trajectory. From an environmental perspective, ecosystems are under severe stress in many areas of the world and the impacts of climate change, exacerbated by increasing populations and consumption levels, are evident.[7]

The Green Economy approach

Bold leadership and new approaches to business, investment and policy are required to confront the crises. Interventions are needed to mobilize and re-focus the global economy towards investments and expenditures in economic sectors that can catalyze the creation of decent jobs and livelihoods, sustained economic development, poverty reduction, and the regeneration of life-sustaining natural resources. This is the objective of UNEP's "Green Economy" approach to sustainable development. One sector ripe for "green" investment is agriculture.

Achievements of agriculture

During the last few decades, there have been significant achievements in the agricultural sector:



Source: UNEP. 2009. The Environmental Food Crisis

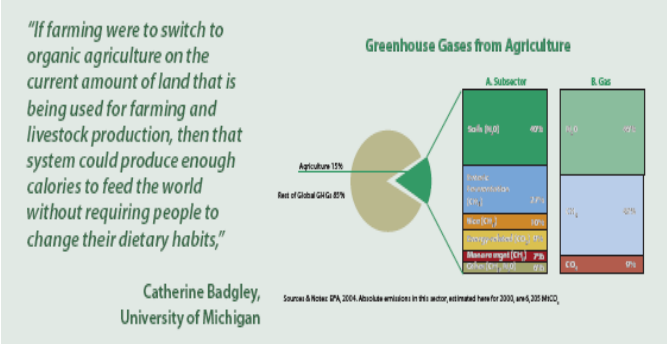
- Over the past 40 years, global crop production has more than doubled,[8] and the world now produces enough food to feed six billion people[9] although the distribution of food is uneven;
- An estimated 1.3 billion workers are engaged in the agriculture sector globally. In many parts of the world, and in most developing countries, agriculture is the largest source of employment and livelihoods,[10] especially in areas where poverty is concentrated;[11]
- Agriculture is the largest contributor to gross domestic product (GDP) in many developing countries. In sub-Saharan Africa and Asia, it contributes an average of 64 per cent and 20 per cent, respectively, to GDP;[12]
- Increased prosperity brought about by advances in agriculture has reduced poverty;[13]
- Many farmers have made significant contributions to the conservation of biodiversity and have been at the forefront in developing more sustainable approaches to farming.[14]

These achievements notwithstanding, the agricultural sector today is at a crossroad.

Challenges for agriculture

Agriculture faces, and contributes to, several challenges that involve enormous economic, social and environmental costs:

- Globally, the growth rate of agricultural productivity is declining, and in many countries productivity is actually falling.[15]
- "Agriculture is ranked as one of the three most hazardous sectors along with mining and construction. Machinery such as tractors and harvesters cause the highest frequency and fatality rates of injury. Exposure to pesticides and other agrochemicals constitute major occupational hazards which may result in poisoning and death and, in certain cases, work-related cancer and reproductive impairments."[16] Every year three million cases of pesticide poisoning result in approximately 220,000 deaths. [17]
- Agriculture workers, especially in rural areas and in the informal sector, are under serviced by basic health and occupational health services. The most vulnerable groups are workers in family subsistence agriculture, daily labourers in plantations, seasonal and migrant workers, women workers and child labourers.
- Increasing numbers of suicides, a phenomenon reported among farmers in Asia, can be attributed in part to increasing costs of inputs and shrinking profit margins.[18]
- Agriculture accounts for 70 per cent of global freshwater use and is also responsible for most surface water pollution. If current patterns of consumption continue, the world is expected to run out of fresh drinking water well before it runs out of oil.[19]
- About 13 per cent of global greenhouse gas emissions come from agriculture,[20] mainly due to its heavy reliance on nitrogen fertilizers. Nitrous oxide has global warming potential that is 310 times greater than CO_2.[21]
- Agricultural production is dependent on subsidies, particularly in developed economies. In 2008, agricultural subsidies in OECD countries amounted to US$265 billion.[22]
- The impacts of unsustainable agro-chemical use are increasingly evident. Agriculture is now a major cause of biodiversity loss.[23]
- Land scarcity and land degradation associated with agriculture are rising. Declining soil fertility and increasing erosion are leading to growing levels of desertification.[24]
- Nutrients, such as phosphorus, needed for mineral-based fertiliser production, are becoming scarce (current reserves are forecast to last only another 100 years).[25] The economic scarcity of these resources may emerge much sooner and could substantially raise the cost of food production, unless dependency on mineral-based fertilisers is reduced.



What is certain is that increasing yields for the next 40 years cannot rely on a "business as usual" model that replicates the practices of last 40 years. This is a critical because by 2050 levels of food production must increase to meet the demand that will result from increasing incomes, urbanization, dietary changes and population growth.[26]

Ever green agriculture

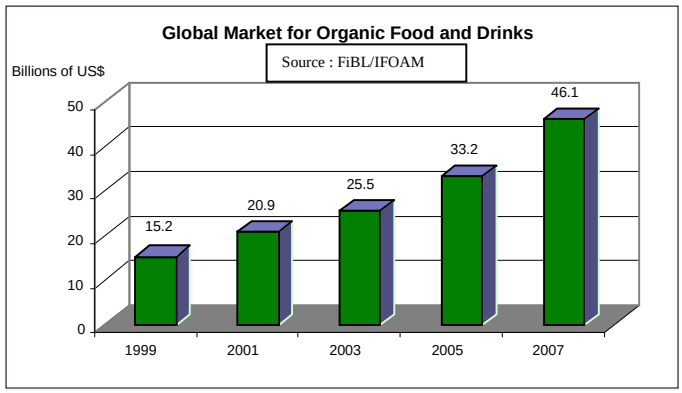
Evidence is mounting from around the world that new sustainable systems for agricultural production[27] present viable alternatives to existing, unsustainable farming practices. These new systems offer opportunities for competitive economic returns, the supply of essential and life-supporting ecosystem services, the creation of decent jobs and livelihoods, smaller ecological footprints, increased resilience to climate change, and enhanced food security. Some common types of sustainable agriculture include: organic, biodynamic, Fairtrade, and Global GAP.

"The way the world grows its food will have to change radically to better serve the poor and hungry if the world is to cope with a growing population and climate change while avoiding social breakdown and environmental collapse"

The International Assessment of Agricultural Knowledge, Science and Technology for Development.

Agriculture: A catalyst for shifting to a Green Economy

- Purchasing patterns of Fairtrade products have remained strong despite the global economic downturn. In 2008, global sales of Fairtrade products exceeded US$3.5 billion.[28]
- The major markets for organic food and beverages are expanding on average by 10 to 20 per cent per year and the global trade now stands at US$50 billion.[29]
- Organic and biodynamic farming uses 20 to 56 per cent less energy per produced unit of crop dry matter.[30] Results of the only available trial in developing countries suggest that the energy efficiency of organic farming is between 70 and 100 per cent.[31]
- Shifting to organic farming can create between 10 and 30 per cent more employment opportunities, depending on farm size and crop.[32] In 2007, Mexican farmers contributed to the creation of an additional 178,000 jobs by converting some agricultural production to organic.[33] Creation of better and more sustainable jobs in rural areas can discourage rural-urban migration and support community development, while increasing and sustaining food supplies to cities.
- Sustainable products command high price premiums, resulting in more income for farmers and others in the supply chain. For example, in Uganda farmers earn up to 180 per cent more for ginger that is produced organically, compared with conventionally produced ginger.[34]
- An FAO study that analysed 50 different cases,mostly from USA, reports that "The overwhelming majority of cases show that organic farms are more economically profitable"[35]
- $C0_2$ emissions, per hectare, from organic agricultural systems are 48 to 60 per cent lower than emissions from conventional farms.[36]
- Sustainable products offer poverty reduction and trade promotion opportunities. For example, while 80 per cent of organic producers (a significant proportion of them women) are in developing countries, about 97 per cent of sales revenue is generated in industrialized countries. This offers the possibility for small farmers to become part of the US$50 billion global organic food market.[37]
- A joint UNEP-UNCTAD study analysing 114 cases, showed that farmers in Kenya, Tanzania and Uganda have doubled their productivity – and ensured food security – by shifting their production to organic or near-organic methods.[38] Data from the UN Food and Agriculture Organization suggest that in subsistence agricultural systems, conversion to organic farming can increase yields by up to 180 per cent.[39]
- The carbon sequestration efficiency of organic systems in temperate climates is almost double that of conventional methods.[40]



- Sustainably managed lands around the world maintain higher soil fertility than other systems.41 They also produce yields that, depending on a range of factors, can be equivalent to,42 or higher than, conventional farming systems.[43]

The business-as-usual temptation might be to clear more forests, drain more wetlands, and dam or divert more river systems, while pouring even greater quantities of fertiliser and pesticides on chemically saturated soils. This approach is likely to prove an environmental dead end, and a market failure of enormous and far-reaching consequences.

Achim Steiner, Executive Director of UNEP

- Higher levels of biodiversity have been recorded on sustainably managed farms around the world in terms of both terrestrial components and soil biodiversity, leading to improved long-term soil fertility and ecosystem efficiency.[44]

Investing in agriculture for a Green Economy

Evidence and analysis suggest that investments in greener and sustainable multifunctional agriculture offer high returns as well as multiple economic, social, and environmental benefits. Governments and businesses are therefore encouraged to invest in sustainable agriculture as a catalysing force for a global shift to a Green Economy. Several investment opportunities exist, including in the following areas:

- Storage and transport infrastructure, especially in developing countries, to reduce post-harvest losses;
- Green industrialisation for adding value through processing raw harvested produce;
- Infrastructure for production, marketing and trade in green inputs, such as organic fertilizers and biological and integrated pest control methods;
- Improving irrigation infrastructure and its efficiency, including at the farm level, to reduce water losses;
- Establishing Green Banks and/or micro-credit programmes for farmers and small- and medium-sized enterprises to offer small "green" loans to buy organic inputs or pay for organic certification, for example.

Enabling Conditions

Changes in behaviour are required to promote the shift to an ever green agriculture and these can be encouraged by new policies to move away from the "business as usual" approach that has dominated the agricultural sector for the past 40 years. Looking to the future, governments and stakeholders should focus their efforts in the following areas.

- Re-directing agricultural subsidies towards supporting more sustainable agriculture;
- Re-aligning trade regimes to support diversification of agricultural production and reduce poverty;
- Lobbying and advocacy efforts to encourage governments, the private sector, and consumers to reduce food waste, and procure and purchase sustainably produced agricultural products;
- Supporting and redirecting agricultural research, academic institutions and training of extension workers and farmers to make sustainable agriculture a model sector for a Green Economy;
- Assisting institutions and facilitating partnerships to build supply side capacities;
- Building capacity to meet the requirements of major markets – especially related to health and environment – at all stages of supply chains, but particularly at the production level, resulting in the creation of a decent work environment and improved occupational health and safety;
- Building institutions that can train policy-makers and negotiators to promote the use of a holistic approach to economic decision making and address issues and negotiations related to subsidies, fiscal and monetary instruments, and trade-distorting measures, among others, as they relate to agriculture;
- Creating and strengthening institutions and entrepreneurial skills that can ensure continuity and sustainability in agriculture's contribution to a Green Economy.

For comments, feedback and more details:

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[27] Among other principles, sustainable agriculture emphasises sustainable resource management – using resources more efficiently and productively e.g, low or no tillage, crop rotation, bio-based fertilisers, native crops, 'more crop per drop' for efficient irrigation systems and post harvest crop management to reduce losses.

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