

Agriculture Fact Sheet

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Some basic facts about agriculture

Since the Second World War, global agriculture has been transformed from small-scale, low-energy input, family-based farming to large-scale, high-energy input, corporate-based industrial farming. In most countries, the industrialisation of agriculture was aided and guided by government policy. The new agriculture held out the promise of feeding the hungry. Its goal was to increase yield while decreasing the cost of production. This was done by using economies of scale, thus increasing efficiencies and by importing exogenous energy in the form of fertilizer, irrigation and biocides coupled with genetic technology. Liberalised trade agreements ensured new markets for the products. Global food trade has grown three-fold since 1961. Industrialisation was introduced to the developing world by the Green Revolution, the result of programmes of agricultural research, extension, and infrastructural development promoted and funded by the Rockefeller and Ford Foundations and other major agencies.

Many farmers willingly adopted these new farming practices that eliminated much of the drudgery from their work. Remarkable increases in agricultural productivity stimulated export markets in many countries. In the developing world, the money received from these export commodities helped to pay foreign debts and fund education and health care programmes. In the developed countries, increase in the productivity helped to keep food prices low. Today, consumers of many developed countries spend less than 10 percent of their income on food.

The benefits of industrial agriculture have come with environmental costs such as depletion of soil, loss of biodiversity and pollution of water ways. It has also led to decline in rural communities and increased dependency of farmers on off-farm corporations and increased dependency of the developing world on the developed world. The following is a summary of the environmental and social costs associated with industrial agriculture.

Impacts and risks

Corporate control of agriculture

Industrialised agriculture has increased the corporate control of agriculture. The needed chemically-based fertilizers and pesticides were readily supplied by a growing number of agribusiness corporations. A small number of global corporations eventually came to dominate the agricultural market. For example, the number of important global food and beverage companies declined from 180 in 1980 to only 60 in 2001.¹ Today, 5 companies control 65 percent of the global pesticide market and 10 seed firms control 30 percent of the global seed market. Five companies control 75 percent of the global vegetable seed market and 5 grain trading enterprises control more than 75 percent of the cereal market.² While farmers were being encouraged to become more competitive, the companies that sold them the inputs and purchased their

¹ Documented by Hope Shand, a member of ETC (Erosion, Technology and Concentration), a group dedicated to the conservation and sustainable advancement of cultural and ecological diversity and human rights. The group is based in Ottawa, Canada. Cf. Halwell, Brian, 2002. Home Grown, WorldWatch Paper 163, November, p. 24.

² All these statistics are cited from Halwell 2002. p. 24.

crops became increasingly monopolistic.

These agribusiness corporations have profited greatly from the industrialised agriculture. Even when farmers have experienced severe financial problems, agribusiness has recorded record profits.³

Social costs of industrialised agriculture

- Rural communities have experienced great change, and in some cases have disappeared as the number of family farms decreased and the size of the farms increased.
- In the developed world surplus production is common, contributing to declines in crop prices, associated farm income, and increases in government subsidies for farmers.
- Increased stress for farmers (including suicide) due to financial problems and the loss of their independence.⁴
- In the developed world, the average age of farmers is above 50 years.
- Reduced biodiversity and a smaller number of economic players increases risks in food security.
- Small-scale agriculture is in crisis around the world.

Environmental costs of industrialised agriculture

- Food production is dependent on fossil fuels and synthetic fertilisers.
- Significant contributor to the production of greenhouse gases.
- Contamination of water by fertiliser- and pesticide-laden runoff.
- Soil degradation from wind and water erosion, the use of synthetic fertilisers and pesticides, compaction by heavy machinery, depletion of organic matter, and the salinisation of irrigated soils.
- Increased desertification.
- Decline in genetic diversity from animal and plant breeding programmes that emphasise traits linked solely to production, and by the reduction in the variety of crops and animals used in farming.
- Depletion of water sources due to irrigation
- Deforestation to clear land for crop production and associated loss in biodiversity.

Monocrop farming

In the developed world, agriculture has changed from primarily being small-scale, family-owned subsistence mixed farming to

³Canada's National Farmers Union tracked the profit margins of 75 agribusiness corporations for the year 2004, a year when per-farm Market Net Income for farmers was in the negative for the second year in a row. 76% of the companies had their best year, or nearly their best. None of the listed corporations experienced a record or near-record loss. Cf National Farmers Union, 2005. The Farm Crisis and Profits, , November 30 www.nfu.ca/new/corporate_profits.pdf

⁴ Vandana Shiva has discussed the suicide of farmers in India resulting, she suggests, from the implementation of Green Revolution policies. cf. Shiva, Vandana 2000. The Violence Of the Green Revolution, Zed Books Ltd., London, and Shiva, Vandana , 2000 Stolen Harvest, India Research Press, New Delhi.

large-scale monocrop production. Plantation agriculture has long been a part of the social and economic fabric of many countries. Yet the Green Revolution introduced large-scale monocrop production to many countries. With a reduced rotation system, monoculture production tends to deplete the soil. It also leads to reduced genetic and variety diversity. As a result, crops are more vulnerable to disease, necessitating increased use of pesticides.

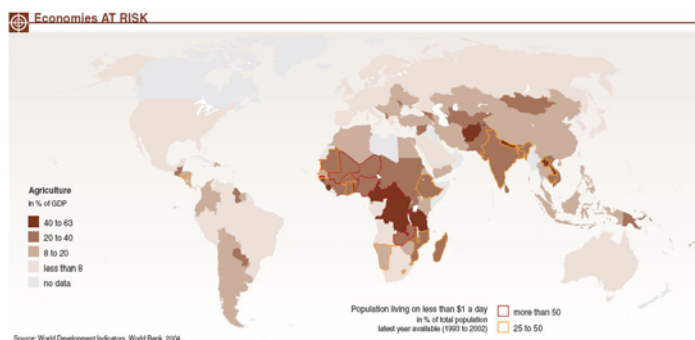


Fig. 1 A high dependence on agriculture signifies a high sensitivity to changes in the environment, such as drought and floods. This map highlights countries with high shares of agriculture (% of GDP).⁵

The effects of a changing environment on food production

The ecological crisis has consequences for the way we produce food in at least three ways:

- Climate change will result in more erratic weather. Farmers are already experiencing the effects of increased drought, flooding, hail storms, etc. It is predicted that many of the present bread baskets of the world could suffer from drought or be flooded by rising seas.
- Conventional agriculture is dependent on a diminishing supply of fossil fuels.
- The deterioration of the present food production environments through desertification and soil degradation will reduce the amount of land that can produce food.

Biofuels

Biofuels produced from maize, sugar cane or other crops have been promoted as an alternative source of fossil fuels. The largest producers of biofuels are the United States and Brazil. Many farmers welcomed the new markets and increased prices for their crops.

Small-scale production should be distinguished from large-scale production. Small-scaled production of biofuels is usually from agricultural residues or from cellulose and other non-food crops. Small-scale production managed by local communities could be part of a decentralised sustainable energy economy.

Some of the concerns about the development of large-scale biofuels are:

- Food-crops will be displaced by fuel-crops. This has the potential to increase food shortages for the poor and to displace small farmers.
- Cropping systems for fuel threatens vulnerable land such as the rain forests of Brazil.

- Cultivation of sugarcane, maize, soybean and oil palm has the negative environmental consequences associated with monocrop production.
- The production of biofuels is energy intensive, requiring fossil fuels for the entire production process. As well, biofuel production and use does not significantly reduce greenhouse gases.

World hunger and agriculture

A stated goal of the industrialisation of agriculture was the elimination of hunger. While increase production has happened, hunger has not been greatly reduced. Hunger has never been a problem of world food scarcity, but rather is a problem of politics. Though consumers of the developed world use a smaller percentage of their incomes on food, food is nevertheless expensive to produce. Hybrid seed, genetically modified seed, fertiliser and fuels needed for industrial agriculture are expensive and increasingly are produced and controlled by fewer monopolistic companies. Farmers in poor countries find it difficult to afford the inputs without subsidisation by foreign aid, and consumers of the developing world cannot afford to buy the food produced. Quite arguably, farmer's ability to overproduce what is actually needed, resulting in the dumping of food on the world market, actually disenfranchises developing world farmers who cannot hope to produce competitively at low, subsidised, developed world prices. In the years to come, hunger will be an even greater challenge with degraded environments.

What can be done?

The following can be encouraged and supported:

Sustainable agriculture: This may include integrated pest and nutrient management systems that reduce the input of pesticides and synthetic fertilizers. Organic agriculture eliminates the use of all chemical pesticides and synthetic fertilizers. The aim of organic agriculture is to grow healthy food that conserves the soil and water resources. Organic agriculture can reduce fossil energy inputs by up to 30%, conserves soil organic matter, has similar crop yields compared to conventional agriculture (though cash crops cannot be grown as frequently over time), has reduced soil erosion, pest problems and pesticide use and has increased biodiversity (aiding in the biological control of pests and increased crop pollination by insects)⁶.

Gene banks that protect heritage varieties of crops and rare breeds.

Organisations of small farmers promoting change in agriculture such as La Via Campesina.⁷

"Buy local food" or the "100-mile diet" campaigns.

Alternative production models that support organic farming such as Community Shared (Supported) Agriculture.

Cooperative movements that support sustainable farming and marketing of farm products.

The **training** of young people in sustainable agriculture.

⁵ Economies at risk - disasters, poverty and agricultural dependence. (2005). In UNEP/GRID-Arendal Maps and Graphics Library <http://maps.grida.no/go/graphic/economies-at-risk-disasters-poverty-and-agricultural-dependence>.

⁶ Pimentel, David, Paul Hepperly, James Hanson, David Douds, and Rita Seidel, 2005. "Environmental, Energetic and Economic Comparisons of Organic and Conventional Farming Systems," by BioScience, July 2005/Vol 55 No 7 pp. 573 - 582.
⁷ www.viacampesina.org