

Backgrounder

Food and agriculture

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Sustainable agriculture in China

Traditions, policies and challenges for feeding the world's most populated country

China's history of traditional ecological farming practices stretches back 4,000 years. But in recent decades the growth of conventional agriculture has taken an environmental toll. Recognition of this has helped spur the recent development — or resurgence — of sustainable agriculture in China. However, this system needs improved governance if it is to provide clarity for producers and consumers, and strengthen the market for sustainably produced foods.

Sustainable traditions

For most of its long history, Chinese agriculture was practised without chemical fertilisers or pesticides. Traditional practices included legumes for nitrogen fixation, intercropping, crop rotation, terracing and systematic recycling of waste. China's four millennia of land fertility can be ascribed to an 'agriculture without waste' ethos, with no

reliance on external inputs. This system was characterised by small-scale intensive farming designed to maximise land productivity in a context of high population density and limited arable land.

Ecological degradation

Industrialisation in the 1960s introduced conventional agriculture. By the 1980s, China's agricultural system was characterised by high inputs of agrochemicals and the pursuit of high efficiency and high output. Significant investments were made in farm machinery, chemical fertiliser industries, and agro-research and development. Indeed, technical progress during this period was impressive: China developed high-yielding rice varieties several years earlier than breakthroughs elsewhere. Modern inputs and advanced irrigation techniques facilitated wide adoption

KEY TERMS

Ecological agriculture: Integration of traditional sustainable Chinese agriculture practices with modern science and technology, based on the principles of ecology, ecological economics, biology and material recycling.

Circular agriculture: Aims to reduce agricultural waste and environmental pollution by focusing on reusing, reducing and recycling material and energy in agricultural production systems. Based on sustainable development thinking and circular economic theory.

Green foods: Certification designation signalling reasonable application of agrochemical inputs (including pesticides, fertilisers, veterinary drugs and additives). Aims to ensure environmental quality in production and safety in end product.

Hazard-free products: Certification designation signalling 'safe' use of government-regulated pesticides, fertilisers, genetically modified organisms and other inputs to food products. Can be understood as equivalent to conventional agriculture production methods.

VITAL STATISTICS

- About one per cent of China's agricultural land is under organic production.
- In 2013 sales of organic products reached ¥20–30 billion (US\$3.2–4.8 billion)
- The 'green food' market value was over US\$60 billion within China and over US\$2.6 billion for exports in 2013.

of the new varieties, which covered over 80 per cent of total rice acreage in 1977. Improved varieties of wheat, corn, sorghum and other crops were also introduced.

This rapid transition allowed food production to keep up with high population growth — a major achievement for a developing country with limited arable land. But this occurred at enormous ecological cost. A range of environmental problems, felt to this day, include: low food safety due to over-use of agrochemicals; excessive consumption and degradation of natural resources; and intensive land reclamation.

These problems pose a substantial threat to China's future agricultural production, and indeed to its economic development. Government and consumers' shared concerns over food safety and environmental sustainability have spurred the development of diverse sustainable agriculture approaches, supportive policy directives and labelling initiatives.

A policy push

In the late 1980s, the Chinese government began promoting 'ecological agriculture', designed to build on traditional production systems using modern science and technology. This approach sought to combine agricultural production and rural economic development with ecosystem protection and efficient use of natural resources, through 'integration, coordination, recycling and regeneration'. As a high-level central policy objective, ecological agriculture framed debate and development of sustainable agriculture in China for more than two decades. In the past decade, 'circular agriculture' has been added to this discussion: based on sustainable development thinking and circular economic theory, it relies on ecological engineering and technologies to increase reuse of material and energy in production systems, thereby controlling inputs and reducing waste.

Eco-labelling

Within this context, several food labels have been developed to indicate different levels of sustainability in their production: organic, green and hazard-free. As early as the 1980s, local governments in various provinces developed 'hazard-free' labelling in an attempt to improve food safety. Formally adopted by the Ministry of Agriculture in 2001, hazard-free foods guarantee 'safe' levels of agrochemicals. Testing and labelling is free of charge and generally applies to conventional agricultural production using government-

regulated pesticides, fertilisers, genetically modified organisms, and other inputs.

As hazard-free foods omit environmental considerations, the 'green food' label was introduced by the Ministry of Agriculture in 1990 in an explicit effort to alleviate the severe ecological impacts caused by intensive conventional farming. The green food label allows limited amounts of chemical fertilisers and pesticides in the production process, and has eco-quality controls in production, processing, packing, storage and transportation. This label is widely recognised by consumers and is credited for supporting the development of organic agriculture in the country, as the costs and requirements for certification are lower than that for organic status.

Organic foods were introduced to China in 1990 by international investors producing tea for export. Today, organic food continues to be exported, but domestic standards have also been developed — among the strictest in the world — and domestic consumption is growing rapidly. As with green foods, organic standards aim to address both food safety and agriculture-related ecological concerns.

Looking ahead

These policy objectives and labelling systems show us that sustainable agriculture is a priority for Chinese leadership. However, ecological and circular agriculture do not have clearly defined standards, and labelling criteria are complex, overlapping and confusing to consumers. Chinese consumers remain distrustful of these labels and sceptical about the effectiveness of the state enforcement systems. Those purchasing eco-labelled foods are largely concerned with food safety, rather than environmental protection. Finally, lack of substantive policy input from farmers, coupled with a limited level of environmental awareness, are barriers to the further development of sustainable agriculture in China.



Knowledge Products

The International Institute for Environment and Development (IIED) promotes sustainable development, linking local priorities to global challenges. We support some of the world's most vulnerable people to strengthen their voice in decision making.

- 'Green food' products are grown on around 6.4 per cent of China's arable land area.

WHY IT IS IMPORTANT

Food production and consumption in China have global impacts. China is the largest producer and consumer of many crops. Even as imports of grain, soybeans and other agricultural commodities continue to rise, the country is also a major agricultural exporter of fresh produce and processed foods. In this context, changes in China's agricultural sector matter everywhere.

But Chinese agriculture is facing major environmental challenges. The use of fertilisers and pesticides is among the highest in the world. Soil erosion, soil pollution and loss of agricultural biodiversity are widespread. Water scarcity affects many parts of the country, as evidenced by the north's plummeting water tables.

A national shift towards more sustainable production methods would benefit public health in China and beyond its borders. And the environmental gains that would be felt in China would have global repercussions, particularly if the move to sustainable practices brought a reduction in greenhouse gas emissions.



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FIND OUT MORE

Our work on agriculture in China is being undertaken as part of the Sustainable Agriculture in China project run by IIED's China Team and partners at the China Agriculture University. This group drives our efforts to better understand China's sustainable development experience and implications for global development policies. Find out more about our work on China at www.iied.org/China.