

## Policy pointers

**China's experience** shows that sustainable agriculture can boost farmers' incomes and may offer a means of stemming rural-urban migration.

**Policies need to provide** an enabling environment for the emergence of a range of scales and sustainable agricultural models rather than push for large-scale farms and one-size-fits-all approaches.

**Collective organization** is key to the viability of sustainable agriculture as well as the livelihoods of smallholders and policy needs to support a range of collective arrangements.

**There is a key role for** the state — particularly local government — in promoting sustainable agriculture, such as in providing financial support for certification and organic inputs; attracting investment; and mediating between farmers and enterprises.

## Fertile futures: nurturing the shoots of China's sustainable agriculture

In only a few decades, China's farming has evolved from a diverse 'agriculture without waste' to one increasingly reliant on specialised, high-external input, resource-intensive, commercially-oriented models. Today, Chinese agriculture faces major environmental challenges, from unsustainably high applications of fertilisers and pesticides to widespread soil erosion, pollution, water scarcity and the loss of agricultural biodiversity. Coupled with the dramatic depopulation of rural areas and high-profile food safety scares, these challenges are prompting the emergence of a growing movement towards sustainable agriculture, witnessed by the rise in ecological farms and organic farmers' markets in major cities, as well as increasing emphasis on sustainability in Chinese policies related to agriculture. This briefing paper summarises these 'new shoots' in sustainable agriculture, drawing on detailed research conducted by IIED and its Chinese partners. It concludes by offering insights into how sustainable agricultural practices can be better supported, both in China and elsewhere.

### Sustainable agriculture in China: then and now

Agriculture in China has developed over thousands of years, laying a solid foundation for sustainable agricultural initiatives in the modern era. In a challenging context of rapid population growth, combined with land and resource scarcity, China's farmers have evolved a wealth of approaches to maintain the fertility and productivity of their land — the return of all human and animal waste to the land; the use of legumes as green manures; the recycling of crop residues, composting, terracing, crop rotations and intercropping; and the adaptation of multiple crop varieties to increase diversity, maintain soil fertility and control diseases

and insect pests.<sup>1</sup> Before the advent of modern agriculture in the 20th century, China's traditional agriculture was among the most advanced and productive agricultural systems in the world.

The transition towards conventional agriculture began from the 1950s and 1960s in the context of industrialisation. The 1970s and 1980s saw the government step up efforts to modernise the nation's agriculture and increase productivity through mechanisation, improved plant breeding and increasing use of agrochemicals. These measures enabled food production to keep up with high population growth — a major achievement for a developing country with limited arable land.<sup>2</sup> However, they also resulted in serious pollution, food safety problems, over-exploitation of water

## *A diverse food system will be more resilient, and there is no blueprint model that works everywhere*

resources, excessive land reclamation and heavy dependence on agro-chemicals. For example, China's applications of fertilisers and pesticides are among the highest in the world, affecting both human health and the environment.

The challenges that China is facing in its food system do not solely hinge on the environment and public health. The rapid pace of urbanisation has led to a mass exodus from rural areas, with major implications for the availability of agricultural labour. Labour shortages in rural areas are a key issue throughout China, as in many other countries. Agriculture holds little appeal for young people, who are migrating to cities in large numbers. Many middle-aged farmers have also migrated to urban areas in search of better livelihoods and social benefits such as education and health care. The result is that the rural population is increasingly made up of women and the elderly. This has influenced their farming operations, such as contributing to the over-use of inorganic fertiliser for reasons of convenience, with resulting impacts on the sustainability of agro-ecosystems. The exodus from rural areas is also prompting many to ask who will do farming in the future.<sup>3</sup>

### **New shoots of sustainability**

Encouragingly, a small but growing trend towards sustainable food production and consumption is emerging once again in China. Government and consumer concerns over food safety and environmental sustainability are spurring the development of a diverse array of sustainable

agriculture approaches, supportive policy directives and labelling initiatives.

### **An increasingly supportive policy context.**

In recent years, national development policies supportive of more sustainable agricultural practices have emerged, in addition to numerous plans, policies and programmes designed to address specific environmental and socio-economic challenges to agricultural sustainability. The most ambitious and overarching of these is the National Plan for Sustainable Development of Agriculture (2015–2030), issued jointly by the Ministry of Agriculture and seven other ministries in 2015. The plan sets out ambitious targets for waste reduction and re-use, and maintaining the quantity of arable land, as well as measures to promote soil fertility management practices, manage soil pollution and redress land degradation. The plan addresses food safety, institutional aspects of agricultural production, as well as promoting farmer cooperatives and specialised producers.

Another aspect of government policy is the growth of officially sponsored certification schemes, which are designed to address food safety and environmental concerns. There are three main certification schemes in China<sup>4</sup>, which represent a spectrum of sustainability, from very high to relatively low:

- **Organic certification** began for export in the 1990s and is now gaining strength in the domestic market as well. Organic standards in China are comparable to international organic standards and are by far the strictest certification system in use in China.
- **'Green food' certification** began in the early 1990s and is awarded to foods that meet standards issued by the Ministry of Agriculture for the use of pesticides, production methods and residue testing.
- **'Hazard-free' certification** was introduced in 2001 and focuses on controlling the illegal use of highly toxic agricultural chemicals and violations of pesticide residue standards.

### **A growing diversity of sustainable initiatives.**

An increasingly supportive policy environment is evolving alongside the growing practice of sustainable agriculture in China. IIED's research (Box 1) has explored these aspects through detailed case studies of cooperatives, companies, Community Supported Agriculture (CSA)<sup>5</sup> schemes, and government- and farmer-led initiatives. Together they illustrate the wide range of interpretations and manifestations of 'sustainable agriculture' in China — from small community-led farmers' associations and remote sheep-rearing societies with targeted local urban

### **Box 1. IIED and our partners' research on sustainable agriculture in China**

While there is already a large body of research into sustainable agriculture in China, it mostly focuses on agricultural technologies, modes of waste recycling, and pollutant reduction and control, as well as agricultural technology demonstration sites in different regions. Few studies pay attention to who applies different types of technology or the driving forces behind their success. There is a dearth of ground-level analysis of what these various approaches to sustainable agriculture look like in China, their motivations, complexity and socioeconomic aspects, the factors which made them viable and the obstacles which need to be overcome to scale them up. To fill this gap, in 2014 and 2015 Chinese researchers from China Agricultural University and the Chinese Centre for Agricultural Policy, and two senior researchers from IIED, conducted in-depth research of eight sustainable agriculture initiatives from seven provinces in China.<sup>6</sup> A desk-based study also explored the historical evolution of agriculture in China with a focus on sustainability — economic, environmental and social. It asked how China's modern development is affecting sustainability in farming and the rural environment, and looked in detail at the influence of policies and measures to transform agricultural production systems in more sustainable ways.<sup>7</sup>

consumers, to large certified organic companies with national distribution. In some cases local government has driven the adoption of sustainable agriculture, as in the case of Wanzai county (Box 2). Here local government spearheaded the promotion of organic agriculture for the export market in order to raise farmers' incomes and promote development in this poor county. In other cases, farmers and consumers have developed innovative models together. For example, CSA is growing rapidly in China and there are now over 300 CSA farms scattered throughout the country (Box 3). Agribusinesses focused on organic and green foods are increasingly common. These trends are being driven by burgeoning demand for 'safe' and healthy food, reflected in the rising market share of organic and 'green' products, both from domestic and imported sources.

### Nurturing the re-emergence of sustainable agriculture

As China is a laboratory for development in many respects, its experiences with a range of scales of production, technologies and institutional arrangements have relevance for other countries and contexts. The lessons emerging from IIED's research provide insights for researchers, practitioners and policy makers into how sustainable agricultural practices can be better supported, both in China and elsewhere.

- **Promote a diversity of approaches.** A central insight is into the value of and need for a diversity of models. There are multiple pathways towards sustainable agriculture, shaped by the tremendous variety and complexity of local conditions which demand context-specific approaches. Initiatives spearheaded by farmers, cooperatives, companies, local governments and urban intellectuals can all be viable in different contexts. Policy therefore needs to preserve and foster a range of models: a diverse food system will be more resilient, and there is no blueprint model that works everywhere.
- **Match scale to context.** Sustainable agriculture can be practised at a small, medium or large scale; the scale should match the circumstances of the particular actors and geographies involved. Though sustainable agriculture is increasingly supported in principle in China, policies normally focus on promoting large-scale farms. Efforts to promote sustainable agriculture in China would benefit from a closer look at the benefits of operating at a variety of scales according to the specific needs and circumstances of different systems.
- **Support collective organisation.** In a context of labour and land shortages, collective organisation is key to the viability of sustainable agriculture. Smallholders acting alone often lack market information and marketing channels and may struggle to adopt technical innovations, such as biogas, mechanisation or agroecological practices. They often lack sufficient inputs such as organic fertiliser or have difficulty getting it to their fields. Collective organisation — eg through cooperatives or CSA — opens up a whole range of resources and services to farmers. Policy on cooperatives needs to be flexible enough to reflect this diversity, particularly by allowing for multi-product cooperatives.
- **Support diversity in marketing.** Marketing is a critical factor in the success and failure of sustainable agriculture efforts. Certification can be one important marketing tool, but this depends partly on geographic location, the nature of local markets and the extent to which farmers are integrated into wider commodity chains. In some cases, such as CSAs, it may not be necessary. Organic certification in particular can be prohibitively complicated and expensive for small farmers and cooperatives. More attention needs to be directed towards simplifying the required certification procedures, unifying the plethora of standards and ensuring that certification fees are covered by government.
- **Attract people back to farming.** There is a need to attract youth back to rural areas, or to

### Box 2. Case study: organic agriculture at scale in Wanzai county

Wanzai county, situated in a remote mountainous area in western Jiangxi province, has played a pioneering role in the development of sustainable agriculture in China. The county's experience can serve as a useful example for other areas in China (and other countries) with similar environmental and economic conditions. Organic agriculture began in one township during the late 1990s with the production of ginger for export, and later expanded to rice, sweet potato, soybean, strawberries, peanut, garlic, radish and many other crops. The local government has been the driving force behind promoting and implementing organic agriculture in Wanzai, providing financial support for certification and organic inputs; attracting investment; mediating between farmers and enterprises; supervising organic production; and providing overall direction. Key among the many lessons that Wanzai has to offer is the crucial role of local government in scaling up sustainable agriculture.

Another important finding from Wanzai is that organic farming can provide better economic returns to farmers than conventional agriculture. A survey of 99 farmers in the county found that regardless of whether calculations of profitability are made on a per-land unit basis or a per-household basis, rice farming is far more profitable for organic farmers than for conventional farmers. This is despite the fact that conventional yields are higher than organic yields. The reason is that organic products tend to have higher market prices than conventional products. Today organic agriculture has become the main strategy for income generation, environmental protection and economic development in the region. Wanzai county is also a national organic agricultural demonstration area — one of about 30 nationwide.

### Box 3. Case study: Shared Harvest CSA

Established in 2011 by Director Dr. Shi Yan and her husband Cheng Cunwang, Shared Harvest is one of the leading CSAs in China. It has over 500 urban member consumers who invest upfront in the farm production each season (by purchasing annual membership plans costing around US\$1,600). In return they receive weekly deliveries of a range of vegetables, grains and meat to their homes throughout the year. The majority of the production comes from two farms on the outskirts of Beijing. In addition, there is a growing number of 'group buyers' (300 at the time of the research) who collectively order goods for weekly pickup at five locations throughout Beijing.

In 2014, Shared Harvest had a total income of about US\$920,000 and a net profit of 10%, without any direct subsidies or government policy support. It aims to stem the trend of out-migration of farmers, as well as to attract more young people into farming. Shared Harvest's vision is that this collaboration between community-based local farmers and 'returned youth' can ultimately help revive rural economies while providing healthy livelihood options for both urban youth and rural peasants. It also aims to educate urban residents about healthy eating and sustainable food systems.

According to Cheng Cunwang, the main challenge facing farmers practising sustainable methods is marketing, not production. 'China's farmers and cooperatives have no real problems with sustainable agricultural production using both traditional and modern technology. The main problem is the market, and the difficulty of communicating the ecological value of sustainable food products.' Certification is one way of accomplishing this, but it is prohibitively expensive for small farmers in China. While all of Shared Harvest's vegetables, grains and meat are produced according to strict organic standards, they are not organically certified. As Shi Yan explains, 'the consumer's belief in you is more important than certification.'

prevent them from leaving in the first place. This is crucial in the light of the country's ageing rural population. Enabling farmers to earn higher incomes in rural areas is the key; our research found evidence that sustainable farming can boost incomes (see Box 2). Other potential solutions are to augment the number of local jobs, for example in marketing by developing local brands of food products, and through on-site food processing. Increased opportunities in commerce and eco-tourism — spurred by the practice of ecological agriculture — have in some cases attracted young people back to rural areas. CSAs have been the most successful model for reversing out-migration, albeit on a small scale (see Box 3).

- **Promote participatory research into ecological farming.** The agricultural research and development system in China prioritises commercialisation and modernisation, with the aims of achieving higher productivity and food security in the short term. However, it is also important to devote resources to research on ecological agriculture methods, particularly those that are viable in the context of labour shortages and difficulties in accessing markets. Modern

approaches and local knowledge should be integrated into research on specific technologies. The evidence from our studies points to the efficacy of conducting participatory action research together with villagers to support sustainable agriculture.

- **Raise awareness of the multiple benefits of sustainable agriculture.** These benefits include not only food security and food safety, but also higher incomes, reduced rural-urban migration, increased biodiversity and environmental health, social harmony and other less tangible but equally important elements. Introductions to ecological agriculture could be integrated into the education system and training programmes for cadres, including visits to demonstration farms. Producers also need training and extension in ecological agriculture to understand its benefits and to implement agroecological practices effectively. Training in marketing is also essential.

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#### Notes

- <sup>1</sup> King, F (1911) *Farmers of forty centuries, or permanent agriculture in China, Korea and Japan*. Rodale Press, Inc., Emmaus, Pennsylvania. / <sup>2</sup> Wang, Z (1999) Theoretical bases of Chinese ecological agriculture. In: Wang, Z and Li, Q (eds), *Chinese ecological agriculture and intensive farming systems*. China Environmental Science Press, Beijing. / <sup>3</sup> Zhu, Q and Yang, H (2011) Who is going to till the land? Survey and thoughts on agricultural labour. *Journal of China Agriculture University (Social Science Edition)* 28(1): 162-169. / <sup>4</sup> Garnett, T and Wilkes, A (2014) Appetite for change: social, economic and environmental transformations in China's food system. Food Climate Research Network, Oxford. / <sup>5</sup> CSAs vary in form, but generally involve an urban 'member' paying a fee for a share of the harvest of a local farm. CSAs facilitate upfront investments in farming activities and provide market stability to farmers, while allowing city residents to have direct access to seasonal produce grown by regional farmers. CSA equivalents originally developed in Japan and Europe in the 1960s, and are becoming increasingly common elsewhere. CSAs often practice organic or ecological agriculture. / <sup>6</sup> Cook, S and Buckley, L (eds) (2015) *Multiple pathways: case studies of sustainable agriculture in China*. IIED, London. <http://pubs.iied.org/17579IIED>. / <sup>7</sup> Wilkes, A and Zhang, L (2016) *Stepping stones towards sustainable agriculture in China: an overview of challenges, policies and responses*. IIED, London. <http://pubs.iied.org/14662IIED>.



### Knowledge Products

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