

UNIVERSITY OF  
**WATERLOO**



SUSTAINABLE  
DEVELOPMENT  
**GOALS**



**How Can Agroecology Contribute to  
SDGs in China?**  
**Information Toolkit for Researchers**

## What are SDGs?

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity[1].

From ending poverty and hunger to responding to climate change and sustaining our natural resources, food and agriculture lie at the heart of the SDGs[2].



## What is agroecology?

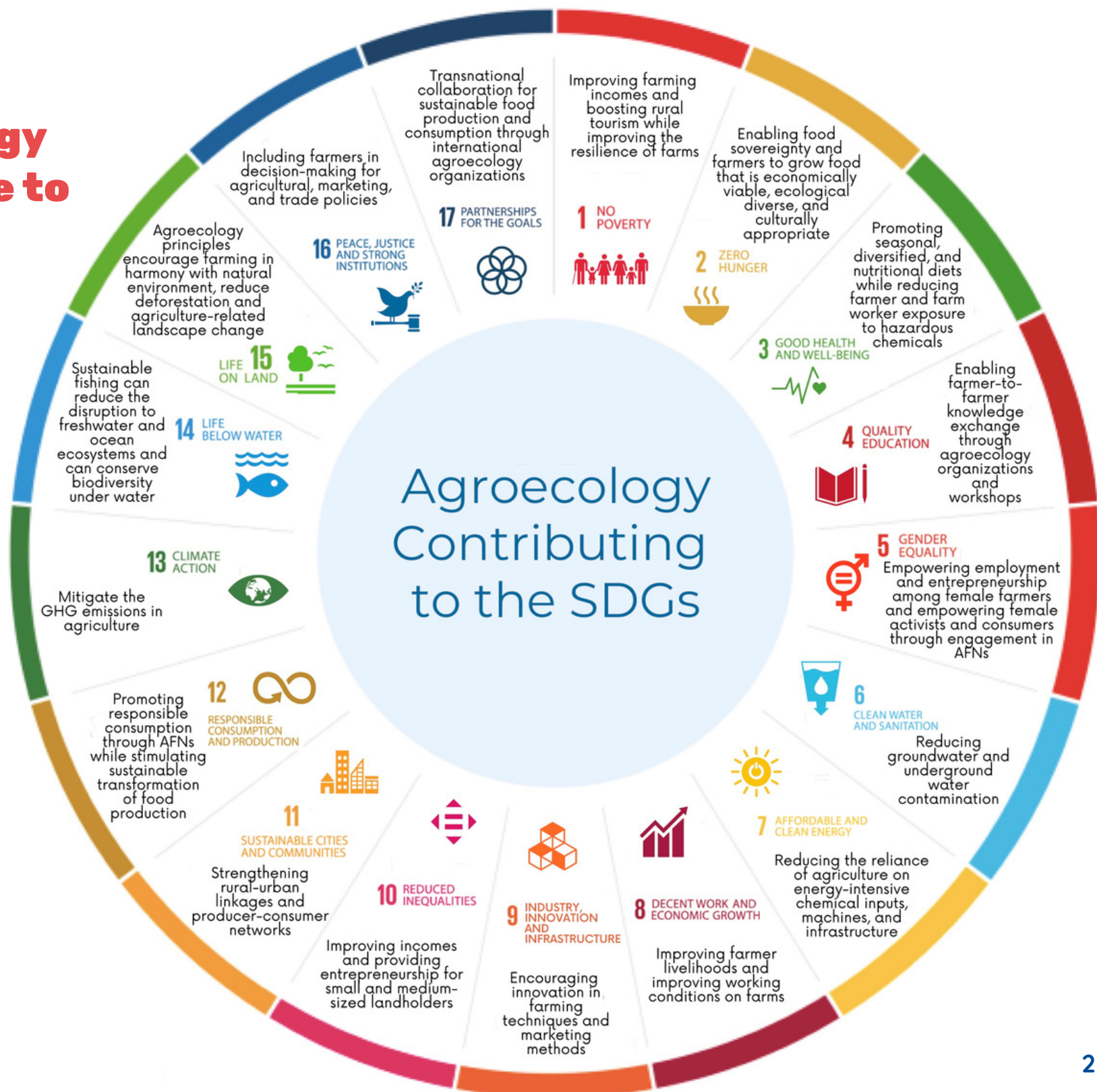
“Today, the term ‘agroecology’ means either a scientific discipline, agricultural practice, or political or social movement”[3]. The meanings of agroecology vary in different regions and contexts. In the 1930s, the term agroecology emerged strictly as a scientific discipline about agronomy and ecology. However, the definitions of agroecology evolved beyond a scientific discipline about food production.

Around the 1980s, the meaning of agroecology was extended to imply a set of ecological agricultural practices promoting environmentalism and rural development. In this information toolkit, our discussions on agroecology focus on agricultural practices and social movements that contribute to environmental sustainability and farmer empowerment.

### 10 elements of agroecology by FAO [4]

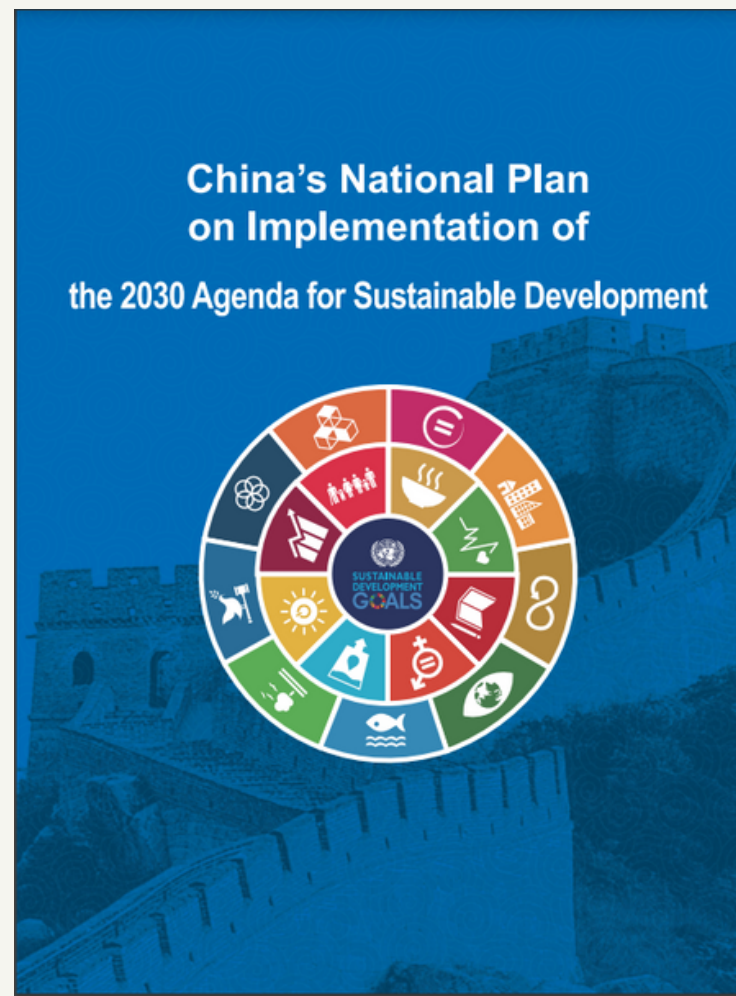


# How can agroecology contribute to SDGs?



# How do agroecology and SDGs feature in Chinese research and policy?

- Overall, there has been a wide range of academic studies established on SDGs in China.
- Existing studies have discussed the **opportunities** and potential for China to contribute to the SDGs[5] by integrating them into domestic development strategies[6] and by connecting them to China's Belt and Road Initiative and promote SDGs collaboratively with other countries in this initiative[7].
- Studies have also pointed out **challenges** facing China in fulfilling SDGs, including overall challenges that China needs to overcome and provide policy suggestions[5][8], and specific challenges such as the disconnect between SDG indicators and the indicators for environmental conservation in China[9], sustainable land use[10], and rural sustainability[11].
- **The Chinese state has integrated SDGs with national development plans.** In 2016, China put forward “China’s National Plan on Implementation of the 2030 Agenda for Sustainable Development”[12].
- Few existing studies have systematically connected the concept of agroecology to SDGs. As this information toolkit will showcase, **agroecology initiatives have contributions to all 17 SDGs.**



# SDGs

## Agroecology's contributions to the SDGs in general

## Agroecology's contributions to the SDGs in China

1 NO POVERTY



Agroecology improves farming incomes and boosting rural tourism while improving resilience of farms.

Short-chain agriculture provides market access and improves income for smallholder farmers in remote areas.

2 ZERO HUNGER



Agroecology enables food sovereignty and farmers to grow food that is economically viable, ecological diverse, and culturally appropriate.

Agroecology and CSA networks improve urban consumers' access to safe and nutritious food.

3 GOOD HEALTH AND WELL-BEING



Agroecology promotes seasonal, diversified, and nutritional diets while reducing farmer and farm worker exposure to hazardous chemicals.

Agroecology reduces the exposure of farmers and farm workers to hazardous chemicals while reducing consumer exposure to harmful chemical residues in food and water.

4 QUALITY EDUCATION



Agroecology enables farmer-to-farmer knowledge exchange through agroecology organizations, workshops, and school curriculums.

Community supported agriculture (CSAs) provide an inclusive and engaging learning space for consumers towards nutritious and low-carbon diets.

5 GENDER EQUALITY



Agroecology empowers employment and entrepreneurship among female farmers and empowering female activists and consumers through engagement in alternative food networks (AFNs).

Agroecology enables women to play a leadership role in food movements and empowers "left behind" women in rural areas by creating livelihood opportunities.

6 CLEAN WATER AND SANITATION



Agroecology reduces groundwater and underground water contamination.

Agroecology reduces the leaching of hazardous agricultural chemicals into the water systems.

# SDGs

## Agroecology's contributions to the SDGs in general

## Agroecology's contributions to the SDGs in China

7 AFFORDABLE AND CLEAN ENERGY



Agroecology reduces the reliance of agriculture on energy-intensive chemical inputs, machines, and infrastructure.

Agroecology reduces agricultural reliance on fossil-fuel based farming inputs including the fertilizer overuse in China.

8 DECENT WORK AND ECONOMIC GROWTH



Agroecology improves farmer livelihoods and improves working conditions on farms

Agroecology helps de-stigmatize farming while improving working conditions for farmers and farm workers.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



Agroecology encourages innovation in farming techniques and marketing methods.

Agroecology informs government policies supporting sustainable adaptation of agricultural industrialization.

10 REDUCED INEQUALITIES



Agroecology improves incomes and provides entrepreneurship for small and medium-sized landholders.

Agroecology initiatives reduce inequality by helping smallholder farmers earn premium prices.

11 SUSTAINABLE CITIES AND COMMUNITIES



Agroecology strengthens rural-urban linkages and producer-consumer networks and informs urban agriculture.

Agroecology promotes ecologically responsible diets and urban agriculture through engaging with urban consumers.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



Agroecology promotes responsible consumption while stimulating sustainable transformation of food production.

Agroecology initiatives promote responsible food production while cultivating responsible food consumption through producer-consumer connections.

# SDGs

## Agroecology's contributions to the SDGs in general

## Agroecology's contributions to the SDGs in China

13 CLIMATE ACTION



Agroecology mitigates greenhouse gas (GHG) emissions in agriculture.

Ecological agriculture has been highly regarded by the Chinese state as a pathway to reduce the application of chemical fertilizers and thereby cutting down agriculture-related emissions.

14 LIFE BELOW WATER



Sustainable fishing can reduce the disruption to freshwater and ocean ecosystems and can conserve biodiversity under water.

Ecological farming prevents and reduces the runoffs of agrochemicals into water and therefore mitigates China's lake water eutrophication challenges.

15 LIFE ON LAND



Agroecology principles encourage farming in harmony with natural environment, reduce deforestation and agriculture-related landscape change.

Agroecology initiatives as such Farmer Seed Network facilitate seed sharing and protect genetic resources of traditional crops and animal breeds.

16 PEACE, JUSTICE AND STRONG INSTITUTIONS



Agroecology initiatives include farmers in decision-making for agricultural, marketing, and trade policies.

Participatory plant breeding and farmer networks lend voice to farmers in decision-making.

17 PARTNERSHIPS FOR THE GOALS



Agroecology catalyzes transnational collaboration for sustainable food production and consumption through international initiatives.

Agroecology enables collaboration between the state, the private sector, and civil society initiatives and contributes to China's environmental and rural revitalization goals.

## SDG 8 DECENT WORK AND ECONOMIC GROWTH



Overall in China, ecological farming, marketing and eco-tourism innovations destigmatize farming and farmers while providing decent working conditions for farmers and farm workers.

Specifically, the average wage of farm workers at organic farms in Xichong county is higher than the local average wage, which contributes to Target 8.3 Promoting development-oriented policies that support decent job creation. The prioritization of organic agriculture has the major driver of economic development contributes to Target 8.4 Decoupling economic growth from environmental degradation.

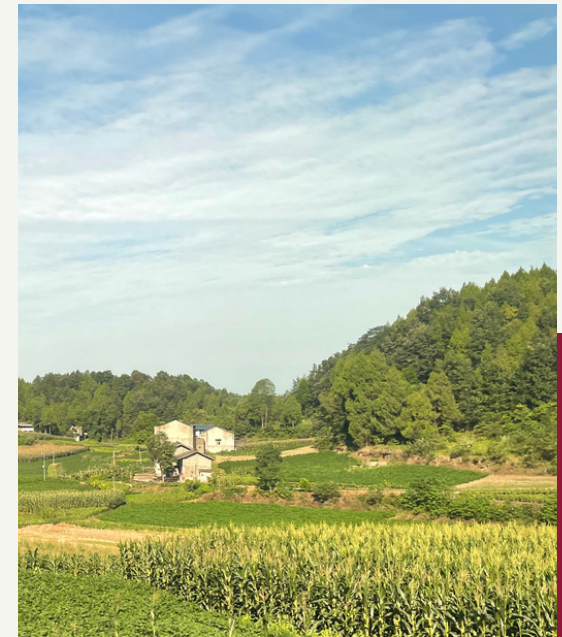


### Agroecology Case 1 Xichong county, Sichuan

Xichong county is located in a hilly area of northeastern Sichuan province, In 2008, the local government put forward the “Developing Organic Agriculture Industry and Building an Ecological and Economically Strong County” strategy. By the end of 2020, the county had built 15,333 hectares of organic food production bases, involving grain, oil, fruits, vegetables, bamboo shoots, sericulture, livestock, and aquatic products.

## Contributions to SDG 8

- Xichong county uses organic agriculture as a channel to market and promote eco-tourism, which has increased the visibility and attractiveness of the local eco-tourism industry.
- Organic agriculture has become the leading industry to the economic development of Xichong County. In 2020, the total output of local organic agriculture exceeded 385 million USD.







## Agroecology Case 2 Time Farm in Nanjing, Jiangsu

Time Farm was founded by James Gu in 2012 in Nanjing on a small piece of land about 3.3 hectares. James follows permaculture principles and prioritizes biodiversity and closed-loop nutrient cycling, insisting that inputs must be produced and processed on farm as much as possible. James increased farm biodiversity through intercropping and combining cropping with animal husbandry.

# SDG 12 RESPONSIBLE CONSUMPTION AND PRODUCTION



Overall, in China, ecological farming and public procurement of ecological foods support sustainable food production while cultivating sustainable food consumption

Specifically, practices by James and his customers contribute to Target 12.4 Achieving the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment and Target 12.5 Reducing waste generation through prevention, reduction, recycling and reuse.

## Contributions to SDG 12

- Time Farm minimizes external farm inputs and contributes to human and environmental health through close-loop nutrient cycling.
- Time Farm has agreements with customers to reuse food scraps from the kitchen. After food delivery, James collects food scraps from customers and makes compost at the farm.
- Time Farm works with customers to reduce plastic food packaging. Customers volunteer to make cloth bags using used clothing.





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### **Agroecology Case 3 Lijun farm in Yantai, Shandong**

Lijun Ecological Farm was founded by Li Lijun in his hometown Yantai City, Shandong Province. By 2021, Lijun farm consists of five pieces of land, a total of 200 mu, including 55 mu of apple orchards, 15 mu of cherry orchards, and the rest are mainly used for various agricultural experiments. The team at Lijun farm continuously learns from nature and conducts scientific research to improve organic apple cultivation.

## **SDG 15 LIFE ON LAND**



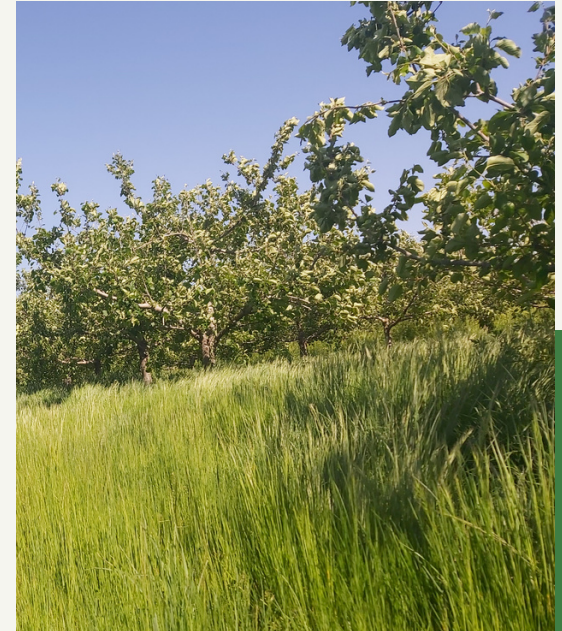
Overall, in China, agroecology practices protect the soil, biodiversity, and the genetic resources of traditional crops and animal breeds.

Specifically, the ecological practices by Lijun farm contributes to Target 15.3 Restoring degraded land and soil and Target 15.5 Reducing the degradation of natural habitats, halt the loss of biodiversity.

## **Contributions to SDG 15**

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- Rabbit manure is used in orchards to enrich the organic matter in soil while annual fescue is planted to maintain humidity and increase biomass in soil.
- Since the adoption of ecological practices, the populations of birds, reptiles, amphibians, rodents and wild plants have significantly increased. So have the populations of insects, such as dragonflies, butterflies, and bees, which are rarely seen in the nearby orchards.



## Main takeaways

- Existing studies and policies have outlined the challenges of and opportunities for China to achieve the SDGs, yet little is known on the systematic connections between agroecology practices and SDG progression in China.
- Agroecology practices and initiatives have broad contributions to ALL SDGs, in general and in the Chinese context.
- Three case studies highlight the contributions of agroecology practices to SDG 8, 12, and 15 by providing decent employment opportunities for farm workers, engaging consumers in waste reduction, and mitigating the decline of biodiversity at and around farms.

**Case studies show that in China agroecology has broad contributions to SDGs**

## Knowledge gaps

- How is agroecology related to each SDG target?
- How can agroecology practices and initiatives benefit from their connections to the SDG agenda and global efforts?

## Challenges

- Access to farmland for new farmers.
- High fees and complicated procedures for organic certification.
- Rising production costs especially due to increasing labour costs and a shrinking pool of farm workers.
- Lack of consistent and committed government support, especially towards small-scale ecological farms.
- Lack of trust in and knowledge about ecological foods among consumers.
- Rising competitive pressure from large e-commerce agribusinesses.



## Future research

- Linking agroecology practices and initiatives in China to the international dialogue on and strategies for achieving SDGs.
- Aggregating the agroecology practices and initiatives to build a comprehensive profile of agroecology contributions to SDGs in China.



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<https://uwaterloo.ca/chinas-changing-food-system/>

# Partner organizations

Food and Agriculture Organization in China  
(FAO China)



The Centre for Sustainable Food Systems at the University of British Columbia (CSFS)



The International Federation of Organic Agriculture Movements (IFOAM-ASIA)



Partnerships for Community Development in Hong Kong (PCD)



Organic Food Development and Certification Center of China (OFDC)



Community Supported Agriculture Coalition (CSA Coalition)

Sources for Action (SFA)  
co-organized by PCD and Beijing Cihai Environmental Foundation



农民种子网络  
FARMERS' SEED NETWORK(CHINA)

Farmers' Seed Network in China

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