



China – Country profile

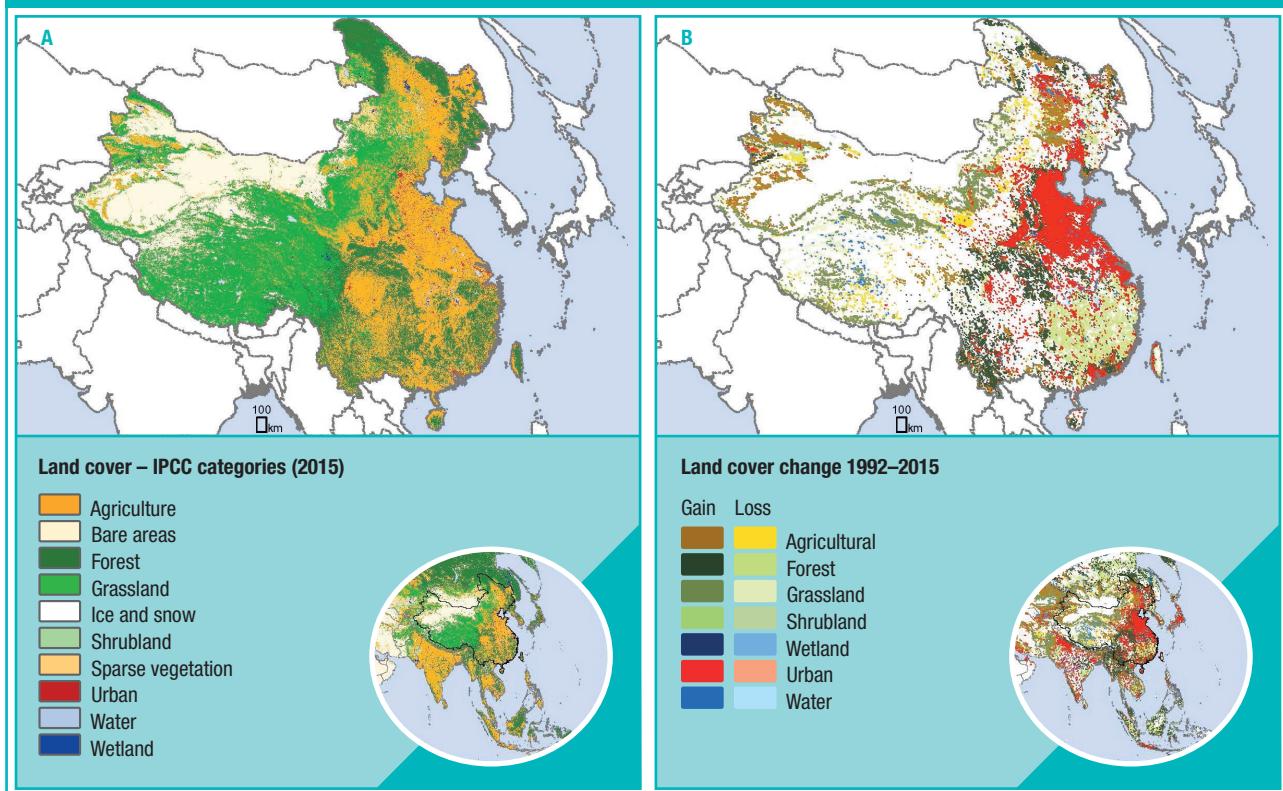
Context

- In China, agriculture occupies about 56% of total land area (Figure 1A) and employs about 27% of the population. In 2017, the sector contributed 8% of gross domestic product and China's agricultural raw material exports accounted for 0.4% of merchandise exports in the same year.ⁱ The country hosts three major agroecological zones: a pastoral region in northern China, a rice region in southern China and a wheat region across the centre.ⁱⁱ China plays an important role in tea and rice production, which are grown in the southern region, mostly for domestic consumption.ⁱⁱⁱ
- China, together with North and South Korea, forms one of the eight Vavilov centres of origin of cultivated plants, with high genetic diversity for at least 136 endemic plants, including several

grains (e.g. rice, sorghum), legumes (e.g. soybean, velvet bean), roots and tubers (e.g. Chinese yam), vegetables and fruits (e.g. Chinese cabbage, onion, cucumber, pear, apricot), drug and fibre plants (e.g. ginseng, opium).^{iv}

- China hosts one of the world's four largest national genebanks at the Chinese Academy of Agricultural Sciences (ICGR-CAAS), with around 450,000 accessions representing more than 180 plants.
- Around 35% of young children (6–23 months) in the country consume a minimum diet diversity. Among adults, the mortality rate attributable to inadequate diets is 350 per 100,000 population.^v
- Accelerated urbanization, industrialization and overexploitation (Figure 1B) have led to habitat loss and serious land degradation, putting higher pressure on agricultural potential.^{vi} The IUCN Red List estimates that in 2015 around 1,040 plant and animal species across taxa were threatened in the country directly or indirectly related to agriculture.^{vii}

FIGURE 1 – Major land use (A) and changes in major land use (B)



Source: Adapted from: A) European Space Agency, 2017;^{viii} B) Nowosad, et al., 2019.^{ix}

Agrobiodiversity Index results

- China scores medium for the present **status** of agrobiodiversity (Figure 2A). Agrobiodiversity in genetic resource management for future use contributes most strongly to the status score, followed equally by agrobiodiversity in markets and consumption and agrobiodiversity in production systems for sustainable agriculture. This trend indicates the high potential for unlocking further use of genetic resources in sustainable production and consumption.

- The **progress** score, which is the cumulative score for commitment and actions, is medium-low (Figure 2B). Commitments, expressed as policies, to enhancing the management of agrobiodiversity across the three pillars are relatively similar to the averages, but evidence of actions on genetic resource management for future use options lags behind.
- Compared to the 10-country average, China scores just below average for both the status and progress scores. Its increasing focus on sustainability can further boost efforts that help unlock the potential of agrobiodiversity along the value chain, from genetic resource management to production and consumption.

FIGURE 2 – Overview of Agrobiodiversity Index scores for China

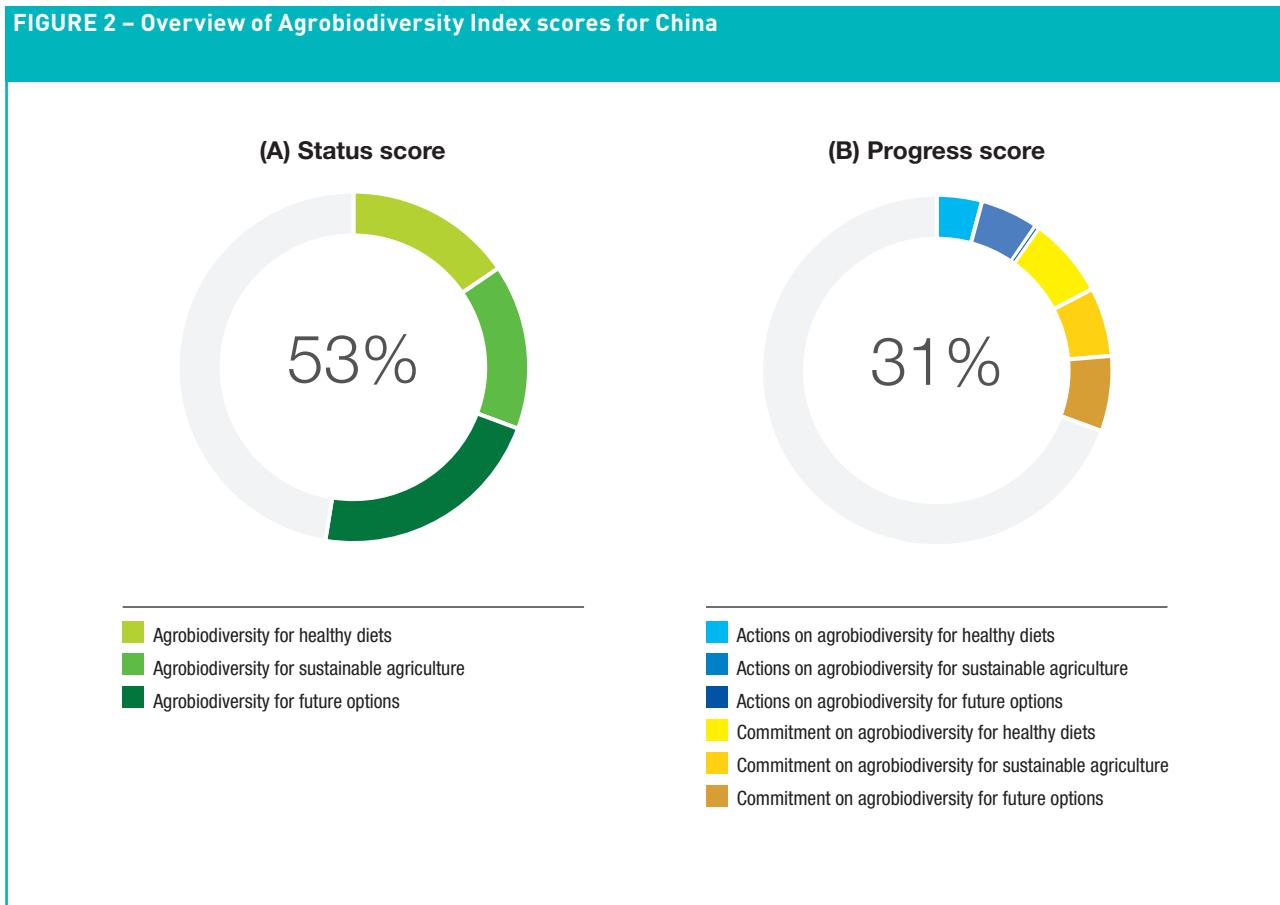


TABLE 1 – Overview of the Agrobiodiversity Indicator scores per pillar for China

		Pillar 1	Pillar 2	Pillar 3
		Agrobiodiversity in markets and consumption for healthy diets	Agrobiodiversity in production for sustainable agriculture	Agrobiodiversity in genetic resource management for future options
Commitment	Level of commitment to enhancing consumption and markets of agrobiodiversity for healthy diets	44		
	Level of commitment to enhancing production and maintenance of agrobiodiversity for sustainable agriculture		38	
	Level of commitment to enhancing genetic resource management of agrobiodiversity for current and future use options			42
Actions	Consumption and market management practices supporting agrobiodiversity	25		
	Production practices favouring agrobiodiversity		17	
	Production diversity-based practices		48	
	Genetic resource management practices supporting agrobiodiversity			2
Status	Species diversity	76	56	89
	Varietal diversity			94
	Functional diversity	14		
	Underutilized/local species	49		14
	Soil biodiversity		31	
	Pollinator biodiversity			
	Landscape complexity		50	

Note: All scores are scaled from 0–100. The colour scheme was changed on 1 August 2019 to reflect more accurately the scores

Leading practices

- Species diversity:** China has high species diversity in genetic resource management, in agricultural production and in markets and consumption. The importance of vegetables in China's production and consumption practices contribute to this high species diversity. Particularly in northeastern China, where farm sizes are very small, species diversity is very high.^x
- Afforestation and agroecology:** China leads large-scale afforestation programmes which, between 2010 and 2015 have contributed to net gains in forest accounting to 1.5 million ha^{xi} and, relevant for agrobiodiversity, to larger amounts of natural vegetation on agricultural land. In ecologically fragile zones in northwestern China, China promotes agroecology, along with ecotourism and rotational grazing, to improve the living standards of local farmers and livestock keepers while conserving biodiversity, including agrobiodiversity.^{xii}
- New food-based dietary guidelines:** China's National Nutrition Plan (2017–2030) aims to achieve a healthy country by 2030, increasing people's nutrition and health literacy, and reducing prevalence of anaemia, stunting and obesity. The newly revised Chinese Dietary Guidelines, which target specific populations, such as infants and children under different ages, vegetarians and pregnant women, aim to increase public awareness of healthy diverse diets.^{xiii}

Areas for improvement

- Genetic resource management practices:** Crop wild relatives of eleven globally important crops are found in China and about 17% of national high-priority native crop wild relatives are considered threatened or near threatened.^{xiv} The country is, therefore, encouraged to develop systematic crop wild relative conservation planning as well as to implement policies to support the conservation and sustainable use of agrobiodiversity for agriculture and food security.
- International reporting on agrobiodiversity:** While China manages a large diversity of plant accessions *ex situ*, information on these accessions is not yet available in the World Information and

Early Warning System (WIEWS) on Plant Genetic Resources for Food and Agriculture. However, China has contributed an in-depth country report to the FAO *State of the World's Biodiversity for Food and Agriculture 2019*, indicating that it has developed a national biodiversity monitoring network, including the use of a habitat-quality index, to evaluate the biodiversity maintenance function of habitats.

- Sustainable production practices:** Land areas under production practices that support agrobiodiversity are limited. For example, agroforestry occupies only 12% of land, conservation agriculture 6%, and organic agriculture 0.3%. Nitrogen-use efficiency (the ratio between the amount of fertilizer removed from the field by the crop and the amount of fertilizer applied), considered as a proxy for avoided overuse of nitrogen, is low at 0.27, highlighting the risk of fertilizer overuse.

Notable findings

- Agrobiodiversity in production:** Out of 122 crops for which global production data are available, China cultivates almost all with 118 in total. Preliminary varietal information indicates that landraces and old cultivars of rice, wheat, soybean, potato, millet and yam have been relatively well conserved but endemic species such as tea, apple and pear demand urgent conservation actions.
- Crop-livestock integration:** 84% of China's agricultural land integrates crop and livestock production. Such integrated systems can contribute to more closed and efficient nutrient cycles, soil fertility, and diversified and resilient production systems.
- Agrobiodiversity monitoring:** China's 12th 5-year Plan for Agricultural Technology Development, compiled by the Ministry of Agriculture, includes monitoring of biodiversity in agroecological systems. China has been involved in large-scale surveys, such as the Sixth National Forest Resources Inventory, the National Wetland Survey, the National Wildlife Resources Survey and the National Survey on Livestock Genetic Resources, resulting in the publication of inventories such as the *China Red Data Book on Endangered Animals*. A national forest, agricultural and marine resource monitoring system has been established at municipal and county levels to support monitoring of trends in species diversity.
- Wild-food resources:** China notes that development and use of wild-food resources has attracted the attention of local governments and enterprises, creating job opportunities and incentivizing environmental protection.^{xv}

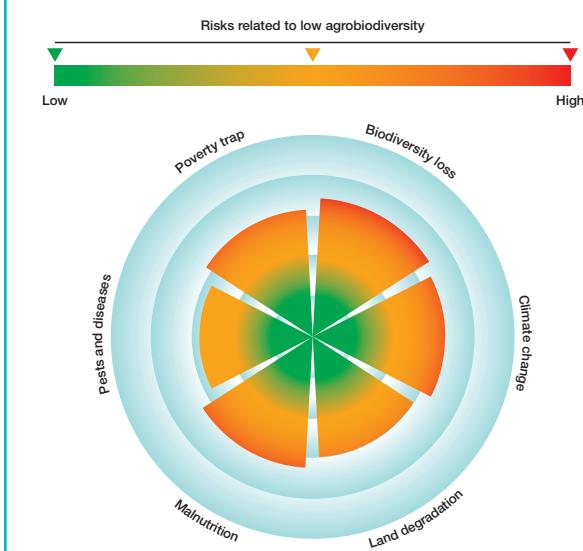
Risk assessment

China is exposed to medium levels of risks related to low agrobiodiversity (Figure 3). This can be explained by the medium-weak explicit commitments and actions to manage and use agrobiodiversity as an adaptation mechanism. The risk for malnutrition, climate change and biodiversity loss are slightly higher. Despite high species diversity, more than 50% of dietary calories come from staples, especially rice. Consumption of fruits, legumes and whole grains is far below the recommended values.^{xvi} For every 100,000 people in China, 7,054 disability-adjusted life years are attributed to inadequate diets.

Resilience building

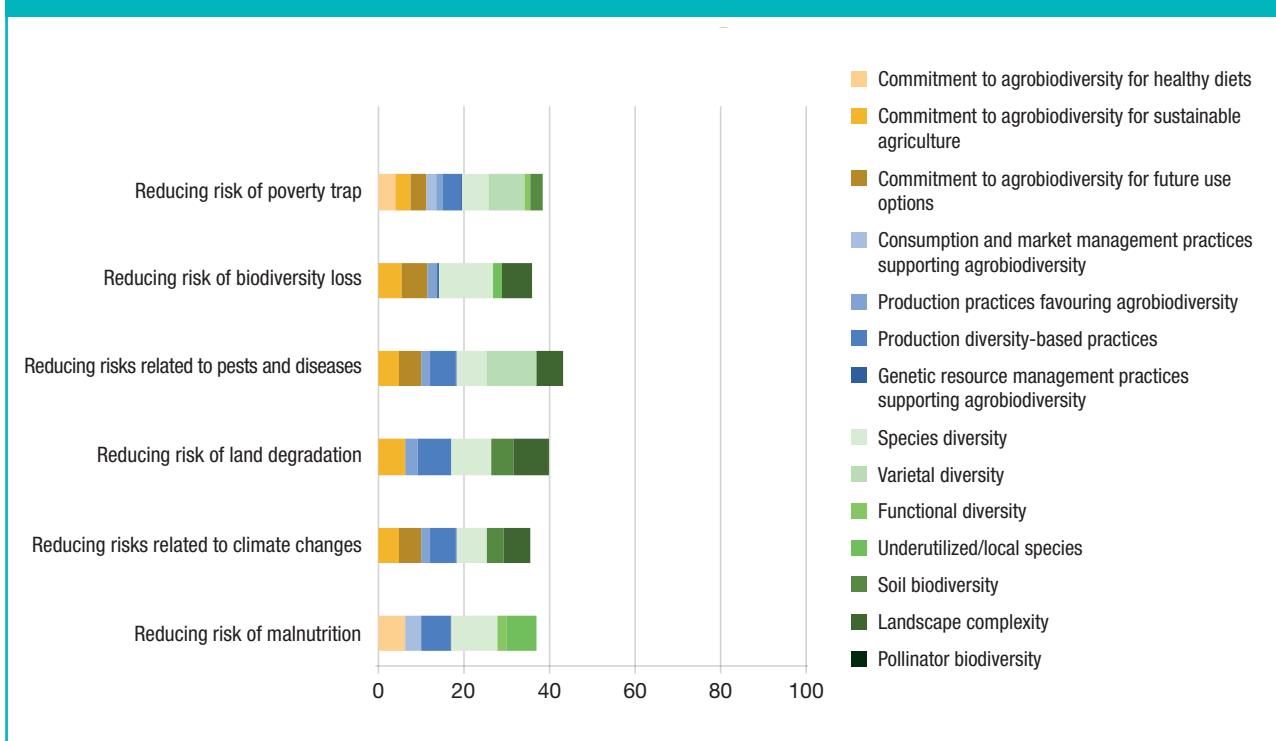
Reversing the risk assessment, existing agrobiodiversity and related actions and commitments help build resilience to multiple risks (Figure 4). Current agrobiodiversity management in China contributes most significantly to managing risks related to pests

FIGURE 3 – Increased risks related to low agrobiodiversity levels in China



and diseases, through the availability of within-species diversity, high species diversity and integration of natural vegetation in agricultural land.

FIGURE 4 – Contributions of Agrobiodiversity Index indicators to resilience building in China



Note: All scores are scaled to a maximum of 100. Colours indicate relative scores of individual agrobiodiversity indicators that contribute to building resilience for that specific risk area. No data available for pollinator biodiversity.

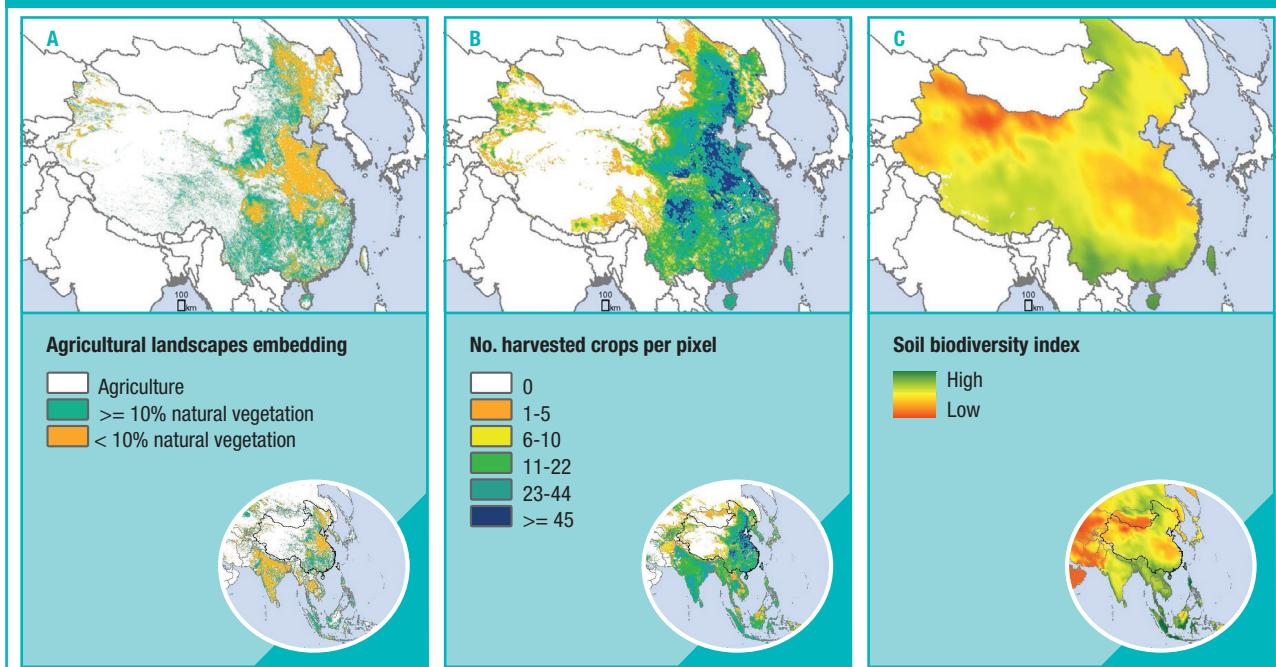
Indicator trends

Spatial trends

In China, 50% of agricultural land contains a minimum of 10% of natural or semi-natural vegetation (Figure 5A). The map indicates that agriculture is more intertwined with natural vegetation in southern China, compared to northeastern areas of the country. On the contrary,

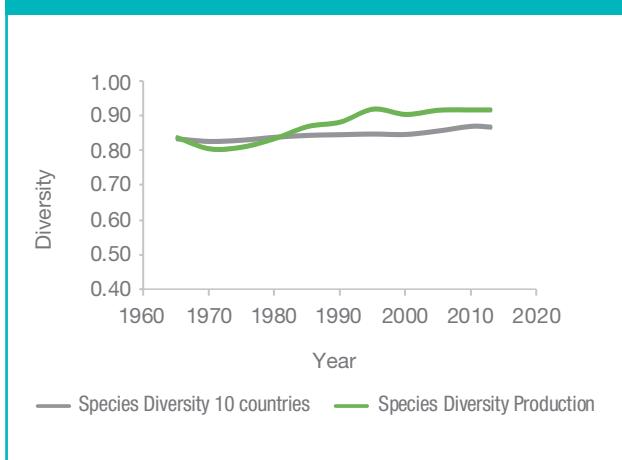
crop species diversity is very high in northeastern China, where farms sizes are very small,^{xvii} and lower in southern China (Figure 5B). Compared to other countries, species diversity per unit of land is high across the whole country (Figure 5B). The soil biodiversity index (Figure 5C) is medium-low in the northwestern arid area, where fragile ecosystems exist, and in the eastern agricultural area, where there is a lower proportion of natural vegetation. Improved management of the intersection of natural vegetation in agricultural land in these areas can help increase soil biodiversity and ecosystem resilience.

FIGURE 5 – Spatial trends in agrobiodiversity indicators for sustainable agriculture, including A) agricultural land with >10% natural or semi-natural vegetation; B) number of harvested crops per pixel, and C) soil biodiversity index



Source: Adapted from: A) European Space Agency, 2017; B) Monfreda et al., 2008;^{xviii} C) European Soil Data Center, 2016.^{xix}

FIGURE 6 – Temporal trends in species diversity in production in China (Shannon diversity index)



Source: FAO, 2019^{xx}

Temporal trends

Overall, species diversity in production increased between 1975 and 1995, reaching levels above average. After the Great Chinese Famine between 1959 and 1961, species diversity started increasing in the 1970s, in parallel with the country's economic development. From 1995 onwards, species diversity in production has remained stable, while the country's economy has transformed vastly.

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