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Challenges and perspectives in the food and agriculture sector in post-2020 China²

POST-2020 CHALLENGES

The year 2020 has been a remarkable year for China in many respects. Despite the COVID-19 pandemic, China's grain output reached a record high of 670 million metric tons in 2020. At the end of 2020, China announced it has eliminated absolute poverty. Yet, China will be confronted with several challenges in the years to come:

- **Achieving carbon neutrality by 2060:** China committed to achieving carbon neutrality by 2060. However, this goal cannot be reached by relying solely on a low-carbon transition of the energy system. To achieve this goal, emission reductions in agrifood systems and the potential of land use, land-use change and forestry as a carbon sink (LULUCF) must be considered.
- **Ensuring environmental sustainability:** The “high-input-high-output” approach that has characterized China's extensive agricultural production over the past decades has placed a heavy burden on China's ecosystems. A “green” transformation of China's agricultural production is critical to pursuing long-term environmental sustainability.

1. This policy note is issued in response to a request from the Permanent Representation of the People's Republic of China to the United Nations Food and Agriculture Agencies in Rome to provide advice on China's agro-economic situation (May 2021).

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- **Protecting the vulnerable and ensuring a smooth transition from smallholder to modern agriculture:** A significant share of the population remains vulnerable to shocks and at risk of falling back into poverty. Although the smallholder model is not viable and not sustainable in the long-term, there are still more than 200 million smallholder farmers in China. Protecting the vulnerable and managing the full transition from smallholder to modern agriculture is critical to maintaining social stability in the country.

The year 2021 offers China an opportunity to further advance its food and agricultural development model: greener, more sustainable and more inclusive.

ACHIEVING CARBON NEUTRALITY: THE POTENTIAL ROLE OF AGRIFOOD SYSTEMS

In September 2020, at the United Nations General Assembly, China indicated it will reach its peak of carbon dioxide emissions before 2030 and achieve carbon neutrality by 2060. The ambitious goal of achieving carbon neutrality by 2060 cannot be reached by relying solely on a low-carbon transition of the energy system. To achieve this goal, emission reductions in agrifood systems and the potential of land use, land-use change and forestry as a carbon sink (LULUCF) must be considered.

According to the China and Global Food Policy Report 2021, greenhouse gas (GHG) emissions from the country's agrifood systems represented only 8.2 per cent of the total country's GHG emissions in 2018. Yet emissions from agrifood systems were still as high as 1.09 billion tons CO₂eq, of which 710 million tons from agricultural activities (compared with 600 million tons in 1990). GHG emissions of agricultural activities are primarily from farmland emissions, animal enteric fermentation, rice cultivation, manure management and agricultural residuals. Agricultural mechanization, the lengthening of the agriculture-related industry value chain, the increased energy consumption in food processing, warehousing, transportation, wholesaling, retailing and catering have certainly contributed to the increase of emissions.

Improving agricultural technologies³ and reducing food loss and waste along the food chain can significantly reduce GHG emissions from agrifood systems. If these measures are also combined with changes in dietary patterns, the report estimates that GHG emissions from agrifood systems can be reduced by 47 per cent by 2060 from the 2020 level, thus significantly contributing to total emissions reduction. In order to promote reduction of GHG emissions from agrifood systems, incentives for the adoption of improved crop and husbandry technologies and energy efficient technologies should be made available (e.g. subsidies for the adoption of improved technologies or practices and for the use of non-fossil energy, and taxes on highly GHG-emitting technologies and sources of energy). Changes in consumers' consumption habits (e.g. recycling, re-using, reducing food waste and shifting to more sustainable diets⁴) should also be promoted through educational campaigns and an appropriate incentive system (subsidies and taxes).

LULUCF offers a considerably cost-effective approach to reducing GHG emissions. In 2014, the carbon sequestration from LULUCF was around 1.1 billion tons CO₂eq. Forestland accounts for about 85 per cent of total net carbon sequestration, whereas farmland, grassland and wetland contribute the remaining 15 per cent. According to the report, carbon sequestration from LULUCF can increase to 1.6 billion tons by 2060. LULUCF can thus completely offset GHG emissions from the agrifood systems. China's current investments in reforestation should be continued. Land saved through technological improvements should be converted into grassland, woodland or wetland. The establishment of a carbon market can contribute to providing incentives to further expand carbon sinks.

3. e.g. Adopting high-yield crops, improving the efficiency of chemical fertilizer use, reducing the overall use of chemical fertilizers, promoting green fertilizers/pesticides, lowering carbon emissions from rice fields through dry-wet alternating measures, using high-efficiency machinery and low-carbon planting and pollution-prevention technologies, adopting improved livestock and poultry production management, smart-healthy breeding, improved feed quality, integrated green-panting and breeding technologies, improved manure-use technologies, green-processing technologies.

4. e.g. The growth of meat consumption in consumers' diets is one of the factors of increased GHG emissions from agricultural activities as livestock enteric fermentation and animal waste management are important sources of GHG emissions. It is estimated that GHG emissions can be reduced by 146-202 million metric tons if consumers adopt more sustainable diets, reducing meat consumption.

ENSURING ENVIRONMENTAL SUSTAINABILITY: PROMOTING SUSTAINABLE AGRICULTURE MORE WIDELY

The “high-input-high-output” approach that has characterized China’s extensive agricultural production over past decades has placed a heavy burden on China’s ecosystems. It has caused pollution and degradation of soil and water resources, and a decline in land fertility, affecting people’s health and causing losses to agriculture. The major sources of agricultural pollution include livestock farming, excessive use of chemical fertilizers and pesticides, burning crop residues and plastic film waste.

A “green” transformation of China’s agricultural production is critical to pursue long-term environmental sustainability. China’s policies have focused on preventing and controlling pollution as the main approach. In addition to that, greater emphasis should be placed on “greening” agriculture, i.e. promoting sustainable agriculture more widely. The adoption of sustainable agricultural practices (e.g. technologies that are less polluting and use land and water resources more sustainably, crop varieties that are more resilient to the effects of climate change, and infrastructure that improves water efficiency) proved effective in reducing the impact of agriculture on natural resources and improving the quality and safety of agricultural products, and should be promoted widely. The application of digital technologies in agriculture can contribute to a more efficient and less polluting use of resources.

Financial incentives (e.g. subsidies to reduce the financial burden on adopters and incentivize the adoption of green technologies and practices, or taxes to discourage the use of environmentally-harmful technologies) can be used to promote wider adoption of sustainable agricultural practices. In addition, new, innovative mechanisms, such as “ecological compensation” (or payment for ecosystem services) can be explored.



PROTECTING THE VULNERABLE AND ENSURING A SMOOTH TRANSITION FROM SMALLHOLDER AGRICULTURE

At the end of 2020, China announced it had eliminated absolute poverty. Yet according to the World Bank, more than 300 million people live on less than US\$5.50 per day (2011 PPP) – the typical poverty line in upper-middle-income countries. Premier Li Keqiang recently declared that there are over 600 million people in China whose monthly income is barely 1,000 yuan. These people are vulnerable to shocks, and at risk of falling (or falling back) into poverty when facing a sudden, unexpected event. As the COVID-19 pandemic has shown, while anyone may contract the disease, it was the most vulnerable who were more severely impacted. A recent study on the impact of COVID-19 on the rural economy in China conducted by the China Academy of Agricultural Sciences and IFAD has shown for instance that 33-40 per cent of the surveyed rural households, the most vulnerable part of the population, reported some level of food insecurity, and that the proportion of rural children who reduced their food consumption during the pandemic was almost twice that of urban children.






China needs to strengthen the capacity of the most vulnerable part of the population to cope with shocks. This can be achieved by increasing and diversifying the income-generating opportunities in rural areas, enhancing access to financial services – credit and insurance – for rural households, and by expanding the coverage of social protection and safety net mechanisms.

Despite the profound transformation in the agriculture sector over the past forty years, China's agricultural production and operations still rely extensively on smallholders' participation. It is estimated that there are still more than 200 million smallholder farmers in China. Although the increasing costs of production and the lack of sufficient scale to be competitive make the smallholder model unviable, and certainly unsustainable, in the long-term, it is likely that a full transition to a large-scale and mechanized agriculture will take some time, and that smallholder production will remain an important feature of China's agriculture sector for still some time. At the same time, the rising demand for high-value agricultural products from an expanding urban middle-class, the rapid transformation of the agrifood value chains, and the spreadout of technological innovations (cellphone coverage, electronic platforms for marketing, etc.) open up opportunities for smallholders, as high-value products are more labour-intensive to produce and generate a higher return per hectare.

In this context, China should pursue a dual strategy. On the one hand, integrating smallholders into modern agriculture. This would entail improving their capacity both to produce at the required quality standards and to access high-value and remunerative markets, including through improved collective organization capacity. On the other hand, favouring the release of labour currently engaged in smallholder farming to more productive and remunerative activities. This would require both creating new, off-farm income generating opportunities in rural areas (e.g. services, tourism, logistics, transport, construction, local entrepreneurship, digital economy), and reforming the household registration system (*hukou*) to remove the disincentives to move away from an inefficient smallholder farming system.



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