



IMPACT OF THE COVID-19 PANDEMIC ON THE RURAL ECONOMY IN CHINA

IMPACT OF THE COVID-19 PANDEMIC
ON THE RURAL ECONOMY IN
CHINA

© 2021 by the International Fund for Agricultural Development (IFAD)

The opinions expressed in this publication are those of the authors and do not necessarily represent those of the International Fund for Agricultural Development (IFAD). The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of IFAD concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The designations “developed” and “developing” countries are intended for statistical convenience and do not necessarily express a judgement about the stage reached by a particular country or area in the development process.

All rights reserved

Cover: ©IFAD/Yinyin Shi

ISBN 978-92-9266-155-7

Printed November 2021

CONTENTS

Background and rationale	8
Objectives	9
Methodology	10
IMPACTS OF THE COVID-19 PANDEMIC ON AGRICULTURAL DEVELOPMENT	12
Impacts on the agricultural product markets	12
Macroeconomy	12
Agricultural products market	13
Impact on agricultural trade	14
Impacts on agrifood chains	15
Impact pathway of agricultural supply chains	15
Impacts on agrifood value chains	16
Impacts on agribusiness and value chain stakeholders	17
Agricultural productive service industry	17
Food processing industry	18
Agricultural enterprises/cooperatives	18
IMPACTS OF THE COVID-19 PANDEMIC ON RURAL LIVELIHOOD DEVELOPMENT	21
Impacts on the income of rural people	21
Impacts of the COVID-19 pandemic on rural household income	21
Impacts of the COVID-19 pandemic on rural household income by main livelihood patterns	23
Impacts on rural employment	24
Impacts on rural employment	24
Impacts on rural employment by type of employment	25
Impacts on saving and spending of rural people	26
Changes in prices of food compared to the previous year	26
Impacts on saving, spending and credit	27
Impacts on food security in rural areas	28
Overall food security	28
Access to food	29
Food consumption	29
Impact on poverty in rural areas	31

POLICY SUPPORT AND COPING STRATEGIES OF RURAL HOUSEHOLDS	
IN RESPONSE TO THE COVID-19 PANDEMIC	33
Government policy support	33
Restoring market function and connectivity for agriculture	33
Promoting alternative coordination and innovation chains	34
Assistance to key agrifood stakeholders	36
Integrating crisis management with the poverty reduction agenda	37
Strengthening employment opportunities by networking local businesses	38
Adhere to the goal of eliminating absolute poverty	39
Rural communities and alternative networks	41
Community-based adaptation and social networks	41
Crisis communication, public awareness and collective action	41
Farmer organizations as the coordinator to cope with disruptions	42
Rural community to harness trust and credibility	43
Hybrid forms of agribusiness through rural communities	44
Agribusiness adaptation and innovation	45
From business to social responsibility: Chinese enterprises in the pandemic	45
Developing resilience and looking for transformation	46
Capacity of logistics and distribution systems	47
E-commerce and agrifood innovations	47
Storage facilities and cold chain as the key	48
Creating employment opportunities through innovation	49
LESSONS LEARNED AND RECOMMENDATIONS	50
Experiences and lessons learned	50
Recommendations	52
References	55

EXECUTIVE SUMMARY

People in rural areas of China, the first region affected by COVID-19, had an extremely challenging year in 2020. The pandemic posed a potential threat to their lives, well-being and livelihoods. While the government was announcing the eradication of extreme poverty in China, the pandemic threatened to reverse years of hard work and success. Though the government adopted strict measures to try to contain the spread of COVID-19, its short- and long-term socio-economic impact on rural people could not be avoided. To mitigate additional negative impacts on the economy, especially for poor people in rural regions, China combined measures to promote economic recovery with the agenda of achieving poverty reduction, a notable success. The understanding of the impact pathways, mitigation strategies and adaptation in China's rural economy during COVID-19 potentially provides a lesson learned of global public good and fills the knowledge gaps in policy advisory and public policy formation at the regional and global levels. This report aims to provide analytical information about the impact of the COVID-19 pandemic on agriculture and the rural economy in China, with a focus on smallholder farmers and vulnerable rural people.

With an approximate meta-analysis approach, the authors of this report collected and analysed a volume of research conducted by various sources. A “disruption-impact pathway-livelihood” framework was developed to analyse the disruptions in the rural economy categorized as supply, consumption, cash flow, microfinancing, employment and trust. The impact pathway, as the consequence of the disruptions, reveals the pathway through the agrifood market, alternative food networks and off-farm activities. Livelihood – as the outcome of the impact – was analysed through income, employment, saving, spending and credit, food security and poverty. Some cross-cutting themes, such as nutrition, gender and migrant workers, are also mentioned.

The key findings are as follows.

Economy. The COVID-19 pandemic caused systematic disruptions in the rural economy, especially in the early stages of the first quarter of 2020. China's gross domestic product (GDP) decreased by 6.8 per cent in the first quarter, affecting the secondary sector in particular, which decreased by 9.6 per cent, while the primary sector decreased by 3.2 per cent.

Prices and trade. The price of agricultural products fluctuated, with a sharp increase in the first quarter due to the overlying impact of the Spring Festival, and a slight increase in the second and third quarters. International trade in agricultural products was severely impacted because of the lockdowns and social distancing measures introduced all over the world. Trade in fisheries, poultry and vegetables suffered a significant negative impact.

Agricultural value chain. Chains of production, transportation, distribution and consumption experienced different impacts. In terms of agricultural products, the impact on cereals was relatively small, while perishable products such as vegetables, fruits and fisheries experienced

severe shocks, mainly in sales. Livestock suffered difficulties due to the limited availability of inputs, disease prevention measures, and in slaughtering and marketing. Disruptions in the agrifood chain were quite challenging: a shortage of farming inputs, transportation and delivery difficulties, reduced labour force, delayed farming practices, and increased levels of food loss and waste. The effects varied by commodity, position in the value chain, and size; short-term effects were more evident for vegetables and poultry than for grain and pigs, and more severe for smallholder farms with limited capacities and smaller networks than large farms.

Coping strategies. Stakeholders' coping strategies differed according to their position in the value chain, and size. The upstream pig producers were forced to sell pigs and downsize piglets to avoid additional fattening and increasing costs; vegetable growers switched to alternative channels, such as e-commerce, and local markets to avoid additional food loss and waste. Enterprises in the primary sector were affected less by the pandemic than those in the secondary and tertiary sectors, but enterprises in the primary sector and agricultural cooperatives still faced five major challenges: the rising cost of agricultural materials, financing difficulties, logistics and transportation disruptions, labour shortages and order cancellations.

Income. There was an obvious decrease in rural household incomes, with the degree of impact varying greatly at different times in various areas and livelihood groups. The wage income of farmers, income from tourism and takings at local restaurants dropped significantly. The large decrease in income in the agriculture sector was mainly due to the decline in livestock sales. Migrant workers' households relied on remittance savings, while farmers relied on perishable products, and self-employed business households saw a significant fall in income.

Women. Women were affected more than men, since a large proportion of women in rural areas work in the agriculture sector. The other hardest-hit sectors were fresh markets, accommodation and catering, wholesale and retail trade, and manufacturing.

Migrant workers. COVID-19's negative impacts on employment were significant. Migrant workers were affected even more than local workers. The higher prices of basic goods increased living costs, while the decrease in income reduced consumption. The vast majority of households resorted to other livelihood coping strategies such as the use of savings or borrowing money from relatives and friends.

Food security and nutrition. COVID-19 had a limited impact on food security in China. However, access to fresh food was negatively impacted because of transportation disruptions, which resulted in a lower quality of food consumption and reduced dietary diversity.

Poverty. Since China was close to eradicating extreme poverty before the pandemic, and the remaining small population living in poverty, mainly residing in the remote western region of the country which had almost no outbreak of COVID-19, was well supported by continuing government poverty reduction programmes, the impact was well managed, and eventually China announced the successful eradication of poverty in December 2020. Some data show that marginally non-poor households are still vulnerable to the risk of falling back into poverty if sustainable livelihood opportunities are not created in the rural economy. It was also found that rural farmers are in dire need of social protection due to their high level of vulnerability, since the quality of education and medical services for poor people in rural areas is still far below that in the eastern coastal regions and urban centres.

The most useful mitigation policy regarding logistics and the transportation of agricultural products from farms to markets is the “Green Channel” policy, which fosters multisectoral coordination to enable market exchange. By providing particular support and attention to large-scale actors, with whom the Ministry of Agriculture and Rural Affairs was directly coordinating, the government avoided food shortages and large price hikes for consumers. Interventions targeted key agrifood chain stakeholders, such as leading agribusiness firms, big chain retailers, e-marketplaces and platforms, with tax reductions, interest-free loans and rental fee reductions. Measures such as subsidies and coupons to boost consumption proved effective. The presence of e-commerce and the use of widespread social media in China’s rural economy during the COVID-19 pandemic mitigated its negative effects and facilitated innovation and the transformation of agribusiness. In addition to functioning long-distance agrifood markets, alternative food networks and community-led innovations – for example, farmer organizations, community-supported agriculture, and village support centres – displayed great potential for harnessing resilience and avoiding further disruptions across regions and sectors.

To ensure sustainable rural livelihoods and a shock-resilient food system, the following recommendations are proposed.

Ensure the availability of and trade in food products by reducing transport barriers. Build on the success of the Green Channel, which re-established the transportation of and trade in essential agricultural inputs and outputs. It was most effective for products that are not rapidly perishable, such as cereals. Improving access to high-quality and hygienic slaughtering facilities and improving storage facilities for producers and collectors would help cushion the impact of a future crisis. Such measures would allow smallholders to increase direct sales to customers or large retailers. Ensure continued access to food, particularly for the most vulnerable households, casual workers, unemployed migrants, and those relying on remittances and smallholder farming. Targeted transfers to these households seem essential to prevent a rise in food insecurity.

In the long term, developing off-farm income-generating opportunities, while taking advantage of the opportunities generated by a modernizing agricultural sector, would help to create sustainable livelihood opportunities. The focus should be on creating additional and diversified off-farm income-generating opportunities – for instance, strengthening cooperatives, local entrepreneurship, the digital economy, services, tourism, logistics, transport and construction. The expansion of the service industries linked to agriculture (e.g. post-harvesting, agroprocessing, food services) has the potential to attract investors and generate new employment opportunities that could retain people in rural areas, and should be leveraged. Moreover, the application of digital technologies and other innovations to agriculture can help increase agricultural productivity and maintaining a role for agriculture in supporting growth.

Expand the social protection system. Though large investments have been made in the rural social protection system since the initiation of targeted poverty alleviation, the COVID-19 pandemic reveals that further investment is required in rural medical care, education and agricultural insurance to prevent people falling back into poverty and to reduce inequality. Extending insurance and pension coverage to migrant workers is very important, as they have limited access to public services and social protection due to their household registration, which is back in their home villages. The rural economy also needs to expand and develop a rights-based, inclusive social protection system to enhance the resilience of relatively poor and low-income groups to any shocks and risks.



INTRODUCTION

©IFAD/Susan Beccio

Background and rationale

After COVID-19 was detected in December 2019 in Wuhan, the capital of Hubei province, it spread rapidly to other provinces of China in the following weeks. In Hubei alone, the number of confirmed cases had grown exponentially to nearly 60,000 by mid-February 2020. After over two months, China had achieved initial success in its containment efforts. The government adopted rigorous quarantine and prevention measures to control the spread of the disease. After the mid-February peak in the number of new cases, the number of confirmed cases of COVID-19 nationwide declined steadily to single digits by mid-March. On 11 March 2020, the World Health Organization officially designated the COVID-19 crisis a pandemic, as the number of cases increased exponentially globally. The COVID-19 pandemic has affected the global economy and social safety nets in an unprecedented manner, and the world is facing great challenges and uncertainty to overcome the crisis. China is no exception, although its containment measures have worked well.

China's rural regions have historically hosted a sizeable population of vulnerable and poor people, the number of whom fell from 98.99 million in 2012 to 5.51 million in 2019 (the State Council Leading Group Office of Poverty Alleviation and Development, 2020). The diagnosis of the impact of COVID-19 on rural communities becomes critical for all development partners, including the United Nations, to share evidence-based good practices and lessons learned with national governments.

From the onset of the pandemic, the Chinese Government adopted strict measures that effectively contained the spread of COVID-19. To mitigate additional negative impacts on the economy, especially on poor people in rural regions, China combined measures to promote economic recovery with the agenda of poverty reduction programmes. The global pace of poverty reduction is slowing down because of COVID-19, which has affected poor and vulnerable people the most and has pushed an additional 88 million people into extreme poverty (Blake and Wadhwa, 2020).

The understanding of the impact pathways, mitigation strategies and adaptation in China's rural economy during the pandemic potentially provides an opportunity to share knowledge of global public good and provide an insight into the knowledge gaps in public policy formation at regional and global levels.

Various institutions have researched these issues from different perspectives, according to their mandates and target groups, and have analysed the impact on agricultural markets and rural livelihoods with a value chain approach and a focus on food consumption.¹ The International Food Policy Research Institute (IFPRI) and Peking University surveyed the impact on livestock and planting from the perspective of agricultural enterprises. The Chinese Academy of Agricultural Sciences (CAAS), with its advantage of wide coverage of agricultural disciplines, analysed the impact on the rural economy and agricultural subsectors in a series of reports on the impact of COVID-19. The United Nations Development Programme (UNDP) and the China International Center for Economic and Technical Exchange (CICETE) assessed economic and social impacts, including on household income, employment, self-employed business, agricultural production and social safety nets, with a focus on poor counties and vulnerable groups, and summarized the lessons. Other studies have assessed the pandemic's impacts on different regions and sectors.²

This report aims to: provide analytical information about the impact of the COVID-19 pandemic on agriculture and rural development in China, with a focus on smallholder farmers and vulnerable people in rural areas; summarize successful government policies and measures and the coping strategies adopted by smallholders; and provide recommendations to increase resilience and reduce vulnerability in the future.

Objectives

The overall objective of this study is to provide a comprehensive, synthesized analysis of the impact of the COVID-19 pandemic on the rural economy, with a particular focus on rural livelihoods at the household level and smallholder farmers. The specific objectives include:

- Analysing the impact on China's overall agricultural development, including on agricultural product markets and agricultural supply chains, and identifying the commodities most impacted;

1 Preliminary findings of a joint report by FAO and the CAAS.

2 For example, Huazhong Agricultural University, China Agricultural University, Chinese Academy of Social Sciences, UNDP, UNAIDS, International Labour Organization.

- Analysing the impacts on China’s rural livelihood development, including income of the rural population, rural employment, saving and spending, food security and poverty, with a particular focus on:
 - Migrant workers due to lockdown and movement restrictions;
 - Challenges faced by smallholder farmers to continue on-farm activities;
 - The impact on food availability, covering agricultural inputs and production;
 - The impact on access to diversified categories of food, and the price impact on basic food items; and
 - The impact on household income from different sources, and householders’ coping strategies as a result of reduced income and saving opportunities;
- Analysing the successful measures that have been taken at various levels, including government, community and household, and the lessons learned in this regard; and
- Providing recommendations to help increase resilience and reduce vulnerability in the future.

Methodology

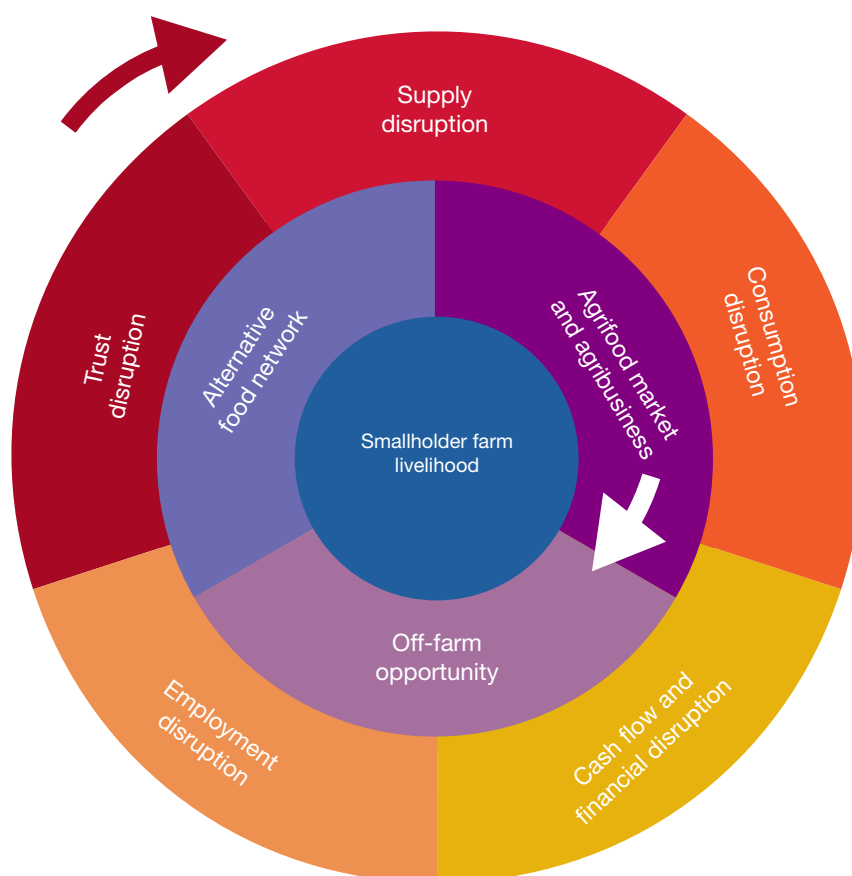
An approximate meta-analysis approach³ was used for this study. This report benefits from a volume of research conducted by various sources, including the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP), the Joint United Nations Programme on HIV/AIDS (UNAIDS), the International Labour Organization (ILO), the World Bank, IFPRI, Johns Hopkins University, the Chinese Academy of Agricultural Sciences (CAAS), Peking University, China Agricultural University and the Chinese Academy of Social Sciences (CASS). Recognizing the various thematic areas, distinct geographical focus and different approaches of existing research, the report preparation process began by compiling, clustering and comparing existing findings from various sources. The references were not limited to academic articles and published bulletins but also included information from a broad range of institutions.

The key questions were the impacts of the COVID-19 pandemic on agricultural development and rural livelihoods. The findings of the report are framed through the nexus of “disruption-impact pathway-livelihood” (figure 1). At the outer layer, disruptions of different types form the changing “landscape” as a result of the COVID-19 pandemic and the subsequent containment measures. The disruptions in the rural economy are categorized as supply, consumption, cash flow and finance, employment and trust. The impact pathway is positioned in the middle of the framework. As a consequence of the disruptions, the livelihood of smallholder farms is impacted through several pathways, including the agrifood market, alternative food networks and off-farm activities. At the centre of the nexus, livelihood is mostly affected through the impact pathways.

3 A meta-analysis is an approach to the synthesis of research results. Key steps include: identify key questions to be answered according to the objectives; identify sources for the study; compile, cluster, compare and synthesize the impact; and reporting.

The approach allows for a great diversity of practices in different contexts of rural economies and locations. The blocks of the outer and middle layers have multiple possibilities of combinations, indicating complexity and diversity of causes, effects, sequence, adaptation and innovation at different levels. For example, containment measures and regulations relating to COVID-19 cause supply disruptions, preventing farmers from procuring inputs (such as fertilizer or vaccinations) or selling agricultural products. The shortages, even in the short term, result in disruptions to retailing. As a chain effect, social trust collapses, and such high-order changes further stress the markets and chain networks towards a regional and system-level disruption.

FIGURE 1: Framework of the “disruption-impact pathway-livelihood” nexus



Source: Jia X.P. 2020. *Holistic and system approaches to the COVID-19 pandemic in rural economy: Beyond sectoral mindset and solutions*. Beijing: Chinese Academy of Agricultural Sciences.



IMPACTS OF THE COVID-19 PANDEMIC ON AGRICULTURAL DEVELOPMENT

©IFAD/Susan Beccio

Impacts on the agricultural product markets

Macroeconomy

From a macroeconomic perspective, the pandemic caused economic growth to slow down and the downward pressure to increase, which directly affected the domestic economy and agricultural and rural development. According to the National Bureau of Statistics of China, China's gross domestic product (GDP) decreased by 6.8 per cent in the first quarter of 2020. The secondary sector was affected most (a decrease of 9.6 per cent), while the primary sector decreased by 3.2 per cent, and the tertiary sector by 5.2 per cent. Nevertheless, the agricultural sector was protected from much of the negative impact of the pandemic and grew by 3.5 per cent nationally due to the priority given to the sector to continue its activities smoothly, even as movement restrictions paralysed the rest of the economy (National Bureau of Statistics, 2020a). With significant strategic achievements in disease prevention and control, and positive results achieved in the resumption of work and production, China's GDP grew by 3.2 per cent in the second quarter. The economic recovery accelerated further in the third quarter, with year-on-year growth of 4.9 per cent, which continued the relatively strong trend of recovery (National Bureau of Statistics, 2020b).

Agricultural products market

The pandemic has increased the instability of the domestic agricultural products market and the volatility of agricultural products prices in the short term.

As shown in table 1, the impact of COVID-19 is most obvious in the first quarter of 2020. The prices of agricultural products increased by 39.0 per cent year-on-year, and by 10.5 per cent compared to the fourth quarter of 2019, and rose sharply for three consecutive quarters. The sharp increase in the prices of agricultural products was mainly driven by the price of livestock products, especially live pigs. Prices of pigs continued to rise sharply, driving up the production prices of live cattle and sheep. Due to the combined impact of African swine fever and COVID-19, the price of pigs is running at a high level. The price of pigs (gross weight) increased by 133.2 per cent year-on-year, and by 23.7 per cent compared to the fourth quarter of 2019. However, with the introduction of a series of measures to resume pig production and the increase in frozen pork reserves, the market supply increased, and the high price of live pigs gradually declined in the second and third quarters of 2020.

When compared with the livestock sector, COVID-19 has not seriously affected the grain production cycle. As shown in table 1, there were stable stocks and supplies of wheat and rice in the first quarter of 2020, and producer prices fell by 5.2 per cent and 3.6 per cent, respectively, while producer prices of corn rose by 0.3 per cent. In the second quarter of 2020, China's agricultural economy demonstrated growth, and the prices of wheat and rice increased by 1.8 per cent and 1.2 per cent, respectively, year-on-year. Affected by the increasing demand driven by the continuous improvement of pig production capacity, corn prices rose by 4.8 per cent year-on-year. In the third quarter of 2020, the prices of corn and rice rose, while wheat prices fell by 1.2 per cent.

TABLE 1: The price of agricultural products in the last five quarters (year-on-year, %)

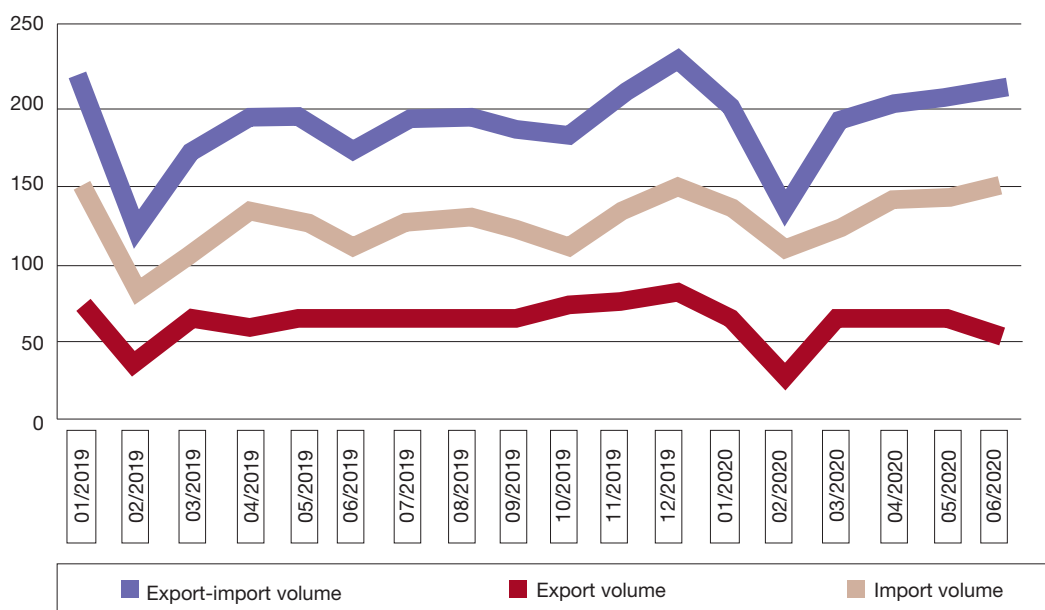
	2019		2020		
	Q3	Q4	Q1	Q2	Q3
Agricultural products	13.9	28.5	39.0	21.1	14.8
Livestock products	32.0	69.7	88.6	50.3	-
Pigs	49.3	109.5	133.2	89.3	59
Sheep	14.2	15.5	10.7	10.2	8.9
Cattle	11.6	22.6	17.5	12.6	-
Poultry	16.4	13.3	-2.3	-10.5	-
Crops	1.1	1.5	1.9	0.5	-
Wheat	-1.9	-0.2	-5.2	1.8	-1.2
Corn	1.3	2.5	0.3	4.8	8.5
Rice	-1.3	-2.0	-3.6	1.2	2.3
Vegetables	-	-	-	-3.2	9.1
Fisheries	1.2	-0.3	-0.1	-3.5	-

Data source: National Bureau of Statistics of China.

Impact on agricultural trade

Imports and exports of agricultural products are facing significant risks caused by the global pandemic. The overall estimation is that the impact is greater on exports than on imports (CAAS, 2020a). As shown in figure 2, the trade value of China’s agricultural products declined most obviously in February 2020, with trade valued at US\$13.9 billion, a decrease of 31.4 per cent month-on-month but an increase of 13.5 per cent year-on-year. Among this trade, the value of exports was US\$2.93 billion, down 55.2 per cent month-on-month and 21.4 per cent year-on-year, while the value of imports was US\$10.96 billion, down by 19.9 per cent month-on-month but up by 28.8 per cent year-on-year. This situation was mainly caused by disease prevention measures, such as movement restrictions and delays in resuming work at enterprises, and blockages in the supply chain of agricultural export products, resulting in considerable operational difficulties.

FIGURE 2: Imports and exports of China’s agricultural products from January 2019 to June 2020 (US\$100 million)



With the continuous improvement of disease prevention and control measures and the downward adjustment of the emergency response level, the Chinese Government has issued a series of policies concerning the transportation and logistics of agricultural products and materials, taxes and fees, credit, and the resumption of work and production, and the effects have been remarkable. The supply chain of imported and exported agricultural products has been gradually restored. According to statistics from the Ministry of Agriculture and Rural Affairs, in the first half of 2020, the value of China’s imports and exports of agricultural products was US\$116.68 billion, an increase of 7.4 per cent year-on-year, with a US\$45.84 billion trade deficit. As shown in tables 2 and 3, imports of cereals increased significantly, the trade surplus of vegetables narrowed, and the trade deficit of livestock products grew by nearly 60 per cent. Imports and exports of livestock products both increased, mainly due to an increase in pork and beef imports, while mutton imports decreased by 4.4 per cent.

TABLE 2: Imports and exports of China's agricultural products in the first half of 2020 (i)

	Import		Export	
	Volume (1 000 tons)	Year-on-year (%)	Volume (1 000 tons)	Year-on-year (%)
Cereals	12 599	33.9	1 561	-8.6
Wheat	3 352	90.3	138	-10.6
Corn	3 657	17.6	2 096	-76.2
Rice	1 238	-2.4	1 361	-7.4
Soybean	45 044	17.7	–	–
Rapeseed	1 475	-23.4	–	–
Pork	2 074	150	–	–
Beef	997	42.9	–	–
Mutton	206	-4.4	–	–

Data source: Ministry of Agriculture and Rural Affairs of China.

TABLE 3: Imports and exports of China's agricultural products in the first half of 2020 (ii)

	Import		Export	
	Value (US\$ billion)	Year-on-year (%)	Value (US\$ billion)	Year-on-year (%)
Vegetables	7.15	-1.0	0.53	11.2
Livestock products	24	43.4	2.64	-18.1

Data source: Ministry of Agriculture and Rural Affairs of China.

Impacts on agrifood chains

Impact pathway of agricultural supply chains

Agriculture is characterized by uncertainty and volatility, making the supply chain of agricultural products more vulnerable than industrial products when facing a crisis such as the COVID-19 pandemic. The impact of the pandemic on the supply chain of agricultural products mainly comprises the following aspects (Zhang X C, 2020).

- **The origin.** During the pandemic, it became more difficult to sell fresh agricultural products. In addition to Hubei, where the pandemic was most serious, fresh agricultural products were affected in Shandong, Henan, Yunnan, Jiangxi, Sichuan and other places, resulting in a significant decline in sales. On the one hand, the cold chain and logistics network for agricultural products faces considerable problems, lacking an early-warning system and effective planning tools, making it easily disrupted. On the other hand, a serious shortage of pre-cooling storage facilities in the producing areas leads to the problem of centralized clearing of agricultural products, which is always difficult to solve.
- **Transportation.** The pandemic forced many upstream agricultural product bases to urgently change their traditional circulation routes. Previously, agricultural

products generally passed through distribution channels such as brokers of origin, first-class wholesalers, second-class wholesalers and terminal retailers, and finally reached consumers. After the outbreak of COVID-19, the traditional access routes were blocked, and the supply of and demand for e-commerce and direct sales increased sharply.

- **Warehousing and distribution.** Terminal cold chain storage and distribution facilities are lacking, making it difficult to meet the rapid growth of online demand. With the change in the status of the pandemic and the increase in return passenger flows, communities (villages) have implemented closed management, and residents' demand for fresh agricultural products such as vegetables has increased. Online cost reduction, direct distribution and contactless shopping pose great challenges to the current cold chain storage and distribution system. According to the investigation in Beijing, the total amount of direct sales and distribution in the supply chain after the pandemic will increase by about 2 million tons within two or three months, and the amount of fresh agricultural products that need direct distribution will increase by about 8.03 million tons within a year, which makes it difficult for the traditional cold chain supply chain to adapt in such a short time. Facilities such as front warehouses and cold storage distribution centres for fresh e-commerce are in especially short supply.
- **Consumption.** Against the background of disease prevention and control, large numbers of offline catering enterprises closed, the demand for fresh fruits from offline channels plummeted, and some local wholesale markets closed down. The proportion of food and beverages consumed in catering enterprises will be greatly reduced, household consumption will be greatly increased, and the proportion of e-commerce will be greatly increased. In the long term, farmers' markets are still the most important sales channel for fresh products, highlighting the importance of standardized operation of farmers' markets. Small, scattered and chaotic farmers' markets are bound to face the prospect of being banned or extensively overhauled. The old wholesale market of agricultural products has serious drawbacks, and its elimination is an inevitable trend.

Impacts on agrifood value chains

Cereals. Since the outbreak of the pandemic and the lockdown measures that followed took place earlier than the main cropping seasons in March, the impact on cereal production was limited. The main impact affected early rice, due to difficulties in accessing seeds, fertilizer and chemical pesticides, and large-scale producers suffered more than small-scale producers, as there was a delay in labourers returning to farming, while small-scale farmers mainly rely on household labour.

Vegetables and fruits. COVID-19 impacted the whole value chain of vegetables and fruits. Insufficient labour because of the lockdown delayed harvests and caused loss. A shortage of labour in procurement, grading and packaging also impacted sales, together with the constraints on transportation, which further reduced marketing. In an online survey organized by the CAAS,

67 per cent of households that produced vegetables and fruits in Hubei reported difficulty in selling. In a survey of 46 cooperatives in Shanghai, almost half of households reported adjusting their planting structure, and a third will consider adjusting the scale of farming. E-commerce has become a new vegetable value chain in China, although there are still challenges for smallholder actors to participate in and benefit from online selling.

Livestock. Livestock suffered severe impacts for three reasons. First, insufficient inputs and the rising price of piglets, chicks and feedstuffs. increased production costs. Second, the slaughterhouses were closed, which made it difficult to slaughter and then sell livestock. Third, the lockdown policy hindered livestock disease prevention, transportation and marketing.

Pig production and pork consumption play an important role in the agriculture sector of China, with pork accounting for about two thirds of meat consumption in the country. The value chains of live pigs and pork are of great strategic significance for the food and agricultural value chain. Environmental protection policies and African swine flu caused significant damage to pig production in 2019, and the volume decreased by 21.3 per cent compared to 2018, but the trend had become optimistic since the end of 2019 (CAAS, 2020b). After the outbreak of COVID-19, pig supply chains were first affected by limited supplies of raw materials and low sales of inputs. The increase in transportation costs caused increases in input and marketing costs. As a result, the entire pig supply chain was affected by lower production and sales volumes at a time when the pork industry was just starting to recover from African swine flu. It is predicted that it may take another two years for the pig industry to recover to reach the same level of production as in 2018.

Poultry is the second-largest meat consumption [sector] in China. However, due to the short production cycle and long value chain, the short-term impact of containment measures on the poultry value chain is expected to be significant. In the poultry value chain, smallholder producers were more vulnerable to the closure of live animal markets, whereas for large-scale enterprises, shortages of raw materials, chicken inputs and labour caused disruptions in farm management and led to a reduction in profits.

Impacts on agribusiness and value chain stakeholders

Agricultural productive service industry

During the period of travel restrictions and road closures caused by the pandemic, the agricultural productive service industry was greatly affected, and the services that needed to enter villages or cross districts could not be carried out normally. Most of the agricultural product sales outlets, agricultural product and material transportation entities and agricultural machinery service entities stopped operating. According to the investigation by the research team on rural organization of the Institute of Rural Development at the Chinese Academy of Social Sciences, 76 per cent of businesses involved in agricultural services were affected by the pandemic, among which 30 per cent were worried about the pandemic, and 27 per cent were stopped by travel restrictions. During the disease prevention and control period, the costs of services increased due to the inability to hire and purchase agricultural materials normally, and the inability to provide services normally. More than three quarters (76 per cent) of the service providers believed that total costs would increase to varying degrees. The rising costs of providers of agricultural services were passed on to agricultural management enterprises, and the extra

costs of adopting disease prevention measures increased agricultural production costs in the current season. According to the survey, the total production costs of family farms increased by an average of 22.9 per cent, and the total costs of more than 70 per cent of family farms increased by between 20 per cent and about 40 per cent (Wei et al., 2020).

Food processing industry

The pandemic has had a significant short-term impact on agricultural businesses, especially on large-scale businesses, private enterprises, state-owned enterprises and those processing agricultural products (Yang et al., 2020). On the one hand, due to the delay in the resumption of work and the return of migrant workers to their posts, the production recovery of agricultural enterprises has been slow, affecting their capital structure, product structure and market structure. On the other hand, the limited supply of upstream raw materials and the poor circulation of downstream products has obstructed the industrial chain related to the production and operation of enterprises. A series of policies and measures to support enterprises to overcome difficulties has been issued by the state and various localities, but few of the many small agricultural enterprises have been included in the list of key guarantee enterprises. In the short term, it is difficult for agricultural enterprises to completely return to their normal state of production and operation, which also affects related industries, and even employment and economic development.

In China, only 24 per cent of fresh agricultural products are directly consumed by households, while 77 per cent are used as intermediate inputs, of which 41 per cent go to food processing enterprises and 3 per cent are used by restaurants. During the pandemic, many orders were cancelled, and many restaurants had to close. The supply of processed foods remained relatively stable at the early stages of the outbreak (Chen, K. et al., 2020).

According to Shandong Weifang Food Association, by 22 February 2020, 58 per cent of food processing enterprises surveyed had not resumed operations, whereas 81 per cent had resumed or were planning to restart operations in March, and 3 per cent had no idea when they would be able to restart. By March, 68 per cent of firms surveyed had partially resumed operations at between 30 per cent and 60 per cent of their production capacity, while only 10 per cent of firms had fully resumed to pre-COVID-19 levels. For those that had resumed operations, 65 per cent had resumed production of fewer than 60 per cent of their product varieties, of which 39 per cent had resumed production of fewer than 30 per cent of their product varieties and only 16 per cent had resumed production at pre-outbreak levels (Jiang et al., 2020).

Agricultural enterprises/cooperatives

According to UNDP (2020a), COVID-19 has created many challenges for enterprises, including tighter cash flows, a general decline in both market supply and demand, and disrupted supply chains. A third of enterprises only have enough cash for less than one month of operation, and less than 10 per cent of enterprises have enough cash for over six months. The cash reserves of small and medium-sized enterprises (SMEs) are expected to be lower than those of large enterprises. During the pandemic, the three largest operating costs for affected enterprises were staff salaries, loan repayments and rent. Declining market demand is a major pressure faced by enterprises. Enterprises look forward to more policy support on financing from the government and the banking system, and industry-specific support policies.

Enterprises in the primary sector have been affected by the pandemic less than those in the tertiary and secondary sectors, but enterprises in the primary sector and agricultural cooperatives have still faced five major challenges: the rising cost of agricultural materials, financing difficulties, logistical and transportation disruptions, labour shortages and order cancellations. The operation of the entire agricultural product sector was affected by logistical disruptions.

According to the online survey conducted by the Postal Saving Bank of China with 2,240 randomly sampled SMEs (Zhang D, 2020), 148 SMEs in the agriculture sector were interviewed, of which only 20 per cent reported no delays in resuming production, while 65 per cent predicted lower revenues due to the lockdown policy and a lack of cash flow. More than half of enterprises in all sectors reported expecting to face difficulties maintaining the business for more than three months, although this was lowest for SMEs in the agriculture sector (51 per cent). According to a telephone survey of 16 agricultural enterprises and farmer cooperatives in Sichuan, Yunnan, Gansu and Xinjiang by the CAAS, the major difficulties lie in the purchase of inputs, and the transportation and selling of agricultural products. The enterprises faced cash flow pressure caused by rigid expenditures, including staff salaries, rent, loan repayments and electricity expenditure and delays to production and marketing. Countermeasures taken included reducing the scale of production, reducing the workforce and cutting salaries, and reducing investment in agricultural equipment and machinery. Among enterprises in the primary sector, those operating in the tourism sector, restaurants run by local cooperatives, and farmers have been impacted more severely than those involved in production, processing and marketing. Demands from enterprises and farm cooperatives include: opening the “Green Channel” to transport agricultural inputs and agricultural products; supporting the labour force to return to work; and fiscal and financial support, including waiving taxes and fees, delaying and reducing social insurance contributions, increasing loans and minimizing the application procedure for loans.

A survey conducted on the impact of COVID-19 on farmers’ cooperatives in Hubei province (Hubei Province Agriculture and Rural Affairs Department, 2020) found that 44 per cent of enterprises or cooperatives’ agricultural products were either difficult or impossible to sell. The reasons given were as follows: 1) traffic control: local vehicles could not get out, and foreign vehicles could not get in. Even within a county, they often had to go through more than 10 checkpoints, which made driving too difficult; 2) freight costs: whether for local or foreign vehicles, the freight rate increased to up to twice the usual price, and some agricultural products with a low profit margin would be sold at a loss; and 3) psychological panic: after the onset of the pandemic, “fear of Hubei” appeared in many places, and people were generally afraid to consume agricultural products originating from Hubei.

According to a survey conducted by the Hubei Agriculture and Rural Affairs Department, which randomly selected from 132 farmer cooperatives in various cities and counties, during the pandemic, 21 per cent of cooperatives stated that sales income would drop by more than 60 per cent, 35 per cent stated by about 40 per cent, and 16 per cent stated by about 20 per cent. Some cooperatives have no way to respond to a crisis such as a pandemic, generally due to inflexible working practices and a lack of leadership ability.

The survey found that 74 per cent of enterprises or cooperatives experienced difficulty in purchasing agricultural products. The main reasons include: 1) enterprises involved in agricultural production stopped work or reduced production; 2) the main roads were closed. Except for three kinds of substances, others were not allowed to use the roads, and agricultural

distributors could not distribute their supplies; and 3) villages were blocked. The agricultural products stored by distributors could not reach villages and towns, and the distributors could not enter villages and cooperatives.

According to the survey, 78 per cent of enterprises or cooperatives found it difficult to resume production. Because all the rural groups in the province were under closed management, many farmers were also worried about going out and becoming infected, so they generally stayed at home. In addition, hiring workers became more expensive, with wages generally between 20 per cent and 40 per cent higher than normal, and even double or more, which made it difficult to carry out agricultural activities such as spring ploughing or preparing for ploughing.

The survey also found that 74 per cent of business entities had difficulty in financing loans. Because the pandemic affected financial institutions' confidence in the viability of farmers' cooperatives, and the grass-roots financial institutions and guarantee institutions in counties and townships had not yet resumed their normal business activities, it was difficult for most enterprises or farmers' cooperatives to obtain loans.

COVID-19 also added to the uncertainty of business operations. A survey of agricultural export companies in Fujian (Lin et al., 2020) found that although on average agricultural businesses experienced declines in exports, exports of some agricultural products – especially grain and oil – held strong and even increased, implying an essential demand for staple foods during the pandemic. Not surprisingly, exports of medicinal herbs also increased significantly during the pandemic. However, exports of goods such as edible fungi and horticultural products decreased sharply.

During the lockdown period, the cost of remote office communication and coordination increased, the efficiency of employees generally decreased, the difficulty of recruiting suitable employees increased, and the operational efficiency of enterprises decreased significantly. Communication among employees and between employees and managers decreased; it was easy for employees to have doubts about the company's values, their sense of security reduced, and their enthusiasm for work diminished. Besides, to evaluate employees, performance indicators are generally not suitable for remote offices and may be less effective without personal contact.

Faced with the impact of force majeure, many agricultural enterprises had no experience to deal with it. On the one hand, in the disease prevention and control work such as detection and screening, commuting support, and personal protection before returning to work, many enterprises lacked professional health knowledge, resulting in loopholes in prevention and control measures. On the other hand, employees' occupational health/hygiene awareness was generally weak, ventilation in the workplace was generally poor, and it was difficult to handle emergency situations comprehensively, smoothly and in an orderly manner. In addition, the upstream and downstream suppliers of enterprises have a cycle of debt, debt recovery and interest disputes, which applies additional pressure to enterprises in a pandemic.



IMPACTS OF THE COVID-19 PANDEMIC ON RURAL LIVELIHOOD DEVELOPMENT

©IFAD/Guangxi PPMO

The COVID-19 pandemic has had significant impacts throughout the agriculture sector, on employment and on rural livelihoods. This section will analyse the impact on China's rural livelihood development from the perspective of income, employment, savings and expenditure, food security and poverty, identifying the households at risk of poverty and food insecurity and most in need of assistance.

Impacts on the income of rural people

Impacts of the COVID-19 pandemic on rural household income

Due to the various ways in which COVID-19 affected the economy, the pandemic had a marked impact on rural household income. In general, there was an understandable decrease in rural household income, and the degree of impact varied greatly according to the different time periods assessed in various research studies.

Using a social accounting matrix of the input and output of 149 sectors in the economy, the CAAS estimated that per capita income in the first quarter of 2020 would fall by CNY158 (1.0 percent) in rural areas, due to COVID-19, compared to a fall of CNY272 (0.9 percent) for the whole population. The annual per capita disposable income of rural households is roughly one third of the income of urban households. More pessimistic results from the CAAS found that only

1.4 per cent of rural households believed that their annual income had maintained the previous growth rate, and the majority believed that their annual income would decrease by more than 5 per cent. By February 2020, different scenarios estimated that farmers' income would fall by CNY1,634.7 (10.2 per cent), CNY2,046.5 (19.3 per cent) or CNY6,273.3 (39.2 per cent), while the real income of rural households fell by 4.7 per cent in the first quarter of 2020, according to the National Bureau of Statistics.

COVID-19 has also had different impacts on financial resources. According to a survey conducted by the CAAS (2020a) in 19 provinces in 2020, farmers' operating income suffered a loss of about 1.9 per cent, which is relatively small. In terms of income from crops, the impact of the pandemic was mainly due to factors such as disruptions to supplies of agricultural materials, supplies of and demand for agricultural products, and hired labour supply, which are direct impacts. In terms of income from livestock, road closures and other measures taken in various places to block traffic caused shortages of feedstuffs and agricultural materials, which harmed farmers' income to a certain extent. The impact on income from crops in areas with high poverty rates was less severe than in Hubei province and north-eastern and eastern areas of China. Farmers' income from livestock was impacted more severely, with an estimated decrease of 21.4 per cent in the central region, 12.7 per cent in the eastern region and 4.4 per cent in the western region.

Income from rural tourism and local restaurants was estimated to have fallen by 30 per cent, which also marks a significant impact of COVID-19.

The wage income of farmers dropped significantly. According to UNDP and CICETE, the wage income of nearly half of the sample decreased between January and May 2020. The situation was even worse according to the CAAS survey, with up to 47.3 per cent of sampled households predicting that wage income would decrease by between 10 per cent and 30 per cent in 2020, while 21.7 per cent expected a drop of less than 10 per cent, 12.4 per cent expected a drop of between 30 per cent and 50 per cent, 4.6 per cent expected a drop of more than 50 per cent, and 13.2 per cent of respondents expected no impact on their family labour income.

This fall in income was primarily caused by business stagnation, and the resumption of business faced severe challenges such as a lack of funds and materials. Men's wages decreased more than women's, most likely because men's wage per unit of time is generally higher than women's. The decrease in wages for rural workers was smaller than that for urban workers. Wages for rural workers decreased less for female workers than for male workers. The decrease in the wages of workers in poor villages was comparable to that in non-poor villages. The decrease in the wages of local workers was less than that of non-local workers, and less for part-time workers, office clerks, and production and service personnel than for managerial and technical staff. Wages decreased less for workers in the private sector than in state-owned enterprises.

The pandemic had a minor impact on farmers' property income. Only 10 per cent of the farmers surveyed estimated that their family property income would decline substantially, with an average decrease of 10.9 per cent, although the numbers were much higher in the eastern region (60 per cent) and the central region (40 per cent).

The impact on transfer income was also limited. About 10 per cent of rural households predicted a decrease in transfer income, and the average decrease was 8 per cent.

Impacts of the COVID-19 pandemic on rural household income by main livelihood patterns

Based on their income sources, households can be categorized by different livelihood patterns. Employees and migrant workers were greatly affected, which significantly affected the income of farmers. Also, the income of self-employed people decreased on the whole.

According to an online survey conducted with 107 households by the CAAS (2020h) in Linxia prefecture, Gansu province, it was estimated that the pandemic would reduce the income of migrant workers by 20 per cent and the total income of farmers by about 15 per cent. A joint report by the FAO and the CAAS found that in both Hubei and Henan, casual migrants were the most likely to report decreases in income, which were particularly severe in Hubei, where the restrictions were strictest. In Hubei, the second most affected category was that of local casual labourers, while in Henan those depending on remittances from migrants working in other provinces (most likely Hubei) were the most affected.

Recent research (Zhang Y. M., 2000) assessed these impacts on the income and poverty levels of remittance-receiving households using household-level data in an ex ante microsimulation analysis. The analysis found that 70 per cent of migrants were affected by the pandemic – primarily those working in microenterprises, and small and medium-sized businesses. Nearly 50 per cent of remittance-receiving households were affected by remittances falling by more than 45 per cent on average during the lockdown. Nearly 13 per cent of remittance-receiving households that had a low income but were not considered poor before the pandemic fell into poverty due to the crisis, and the poverty rate increased by about 4 percentage points among remittance-receiving households as a whole. The poverty gap index also increased, indicating that many previously poor households became more impoverished.

According to UNDP and CICETE, the pandemic negatively impacted the income of self-employed workers. For example, the number of stores in Yilong, in Sichuan province, particularly those in the service industry, fell by about 10 per cent as a result of COVID-19. During the pandemic, stores were unable to operate normally. They were completely shut down for about two months and had to bear such pressures as rent payments and commodity backlogs.

Only 7 per cent of households growing crops or rearing livestock experienced a fall in total income of more than 50 per cent. Thus, the impact of the pandemic on these households was less than on working households. At the time of spring ploughing, growers faced delays in sourcing farming inputs and a production lag caused by the pandemic. Most of the farmers failed to sell during the period of high prices before and after the first month. This not only caused a loss of income but also hit the confidence of farmers to continue livestock raising in the coming year.

Nearly two thirds (66 per cent) of elderly households lost the opportunity to work outside the home due to the pandemic, and 34 per cent of elderly households were affected by the company that employed them. Some elderly households were working in poverty alleviation workshops; if they lost their jobs, the proportion choosing local work and farming was relatively small. A similar proportion (61 per cent) of households that have family members attending school lost the opportunity to work outside the home due to the impact of the pandemic, while 48 per cent were affected at a company. This may be related to the large number of households with school-attending members employed in companies and enterprises. If they lost their jobs due to the pandemic, the proportion of these households who chose to work locally was low,

and they would not choose to plant crops or rear livestock as an alternative occupation. The survey found that most school-attending households had a wait-and-see attitude towards the pandemic and were unwilling to give up their original high-income jobs. Choosing to wait directly led to a reduction of more than 20 per cent in the total income of more than 43 per cent of school-attending households (CAAS, 2020g).

Impacts on rural employment

Impacts on rural employment

The negative shocks to employment from COVID-19 have been significant. According to Zhang et al. (2020), total employment decreased by 175 million people, or about 23 per cent of the workforce, in the lockdown phase. Employment in manufacturing fell by 63.8 million, in services by 77.0 million, and in agriculture by 34.4 million. While some of the lost jobs will reappear when the economy starts to recover, total employment still declined by 26.2 million jobs in the recovery phase. The impacts of export shocks on employment have been significant. If export demand does not recover, more than 17 million jobs will be lost. Both unskilled and skilled labour have been affected significantly, with unskilled labour hit much harder.

On the whole, the pandemic has caused employment difficulties and labour shortages. For enterprises, the cost of resuming work and the risk of resuming production have been high, and it has been difficult for workers to return to work. For individuals, villages and cities have been blocked off, and it has been more difficult to leave the village to find work (CAAS, 2020b). Also, the pandemic has led to a reduction in labour demand. In the short term, labour demand will decrease by more than 40 per cent in the transportation, storage, postal, accommodation and catering sectors, and will increase by 12.5 per cent in the information transmission, software and information technology service industries. The employment of 90 million labourers will be affected in the short term, and the employment pressure on migrant workers will increase (CAAS, 2020c).

To be more specific, there are three primary reasons why the pandemic caused employment difficulties. First, the pandemic led to a rapid decline in demand, and it was difficult for the service industry to absorb young and middle-aged rural labourers. Due to its labour-intensiveness, the greater concentration of personnel and the greater mobility of employees, the service industry was subject to stricter disease prevention and control measures. The revenues of the catering, accommodation and tourism industries fell significantly, and the rent pressure has been considerable. Most express logistics companies were late to resume operations. Second, due to the spread of COVID-19 and the disease control measures, manufacturing capacity was forced to shrink, construction and infrastructure industries could not start on time, and it was difficult to guarantee employment income for migrant workers in the short term. Third, the pandemic blocked transportation and logistics networks, it was difficult to market agricultural products in winter and spring, and rural tourism stopped completely.

According to research based on national economic statistics for 149 sectors in 2017 released in 2019 (CAAS, 2020c), compared with the baseline plan before the onset of COVID-19, labour demand fell by 43.8 per cent in the first quarter of 2020 in the transportation, storage and postal sector, by 41.6 per cent in the accommodation and catering sector, and by 31.3 per cent in the retail sector. Due to the pandemic, labour demand in the information transmission, software and information technology service industries increased by 12.5 per cent.

Compared to the baseline data from before the onset of COVID-19, the number of employees in secondary and tertiary industries is expected to have decreased by 90.71 million in the short term. This includes a decrease of 13.23 million employees in the manufacturing industry, 19.56 million in wholesale and retail, 15.61 million in the transportation, storage and postal sector, and 7.4 million in accommodation and catering. It is expected that in the second quarter of 2020, compared with the baseline plan without a pandemic, the number of employees in secondary and tertiary industries will have decreased by 12.4 million.

The COVID-19 crisis has severely affected women's employment, since a large proportion of women were working in the rural economy and other hardest-hit sectors, including accommodation and catering, wholesale and retail trade, and manufacturing. The domestic service sector, which employed 30 million domestic workers (96 per cent of whom were women), lost almost all its orders by the end of February 2020. Another reason for the higher unemployment of women is motherhood and family care. Many pregnant women chose to quit their job in fearing COVID-19 infection. The burden of caring for older people and children was exacerbated by the lockdown, as school children stayed home and elderly people were mostly kept indoors, resulting in greater care responsibilities for women (International Labour Organization, 2020).

Impacts on rural employment by type of employment

Migrant workers were the employment group that suffered most from the pandemic. The International Labour Organization (2020) indicates that 25 million migrants were either waiting to return to work because their enterprises had not yet resumed production, or were unemployed, or had no desire to look for jobs again. One key reason is that most of the migrant workers were employed in the hardest-hit sectors. In accommodation and catering, for example, over 60 per cent of jobs are filled by migrant workers, and the output of this sector decreased by 35 per cent in the first quarter of 2020. The proportion of migrant workers who may lose an employment opportunity due to the pandemic is 78 per cent, while the proportion of those who may lose work in a company is 46 per cent. However, in terms of the response to losing their jobs, only 3 per cent of migrant households chose local work and farming. This may be due to few employment opportunities and low wages.

In recent years local poverty alleviation workshops became an effective way to absorb local farmers – especially female workers – in local employment. During the pandemic, the number of poor households working in local poverty alleviation workshops increased, and the stability of the work increased.

According to an online survey in China, the return of migrant workers to the workplace has been hindered, and unemployment pressure has increased. To prevent and control the spread of COVID-19, various localities have made arrangements to postpone work and delay the resumption of production. More than 20 provinces across the country postponed the start of production by 10 days, and the normal production time of enterprises has generally been greatly reduced. At the same time, shopping malls, stores, restaurants, entertainment venues and factories that were not essential for daily life were closed, cross-regional transportation and individual travel were restricted, and home quarantine measures for migrants were strictly enforced. This led to a considerable number of migrant workers unable to return to work on schedule, being unemployed for a long time and even losing their jobs. Migrant workers are

mainly employed in small businesses and microenterprises that find it difficult and are slower to resume work and production. Further, the majority of migrant workers are engaged in unstable employment, with a high degree of flexibility; thus, the pandemic has a significantly greater impact on them than on other employment groups. According to the monitoring data of the Ministry of Industry and Information Technology, on 26 February 2020, only 32.8 per cent of SMEs had resumed operations, compared to nearly 80 per cent of large enterprises. It was not until 29 March that the resumption rate of SMEs reached 76.8 per cent. Small businesses and microenterprises took longer than large and medium-sized enterprises to resume work and production. By 7 March 2020, 78 million migrant workers had returned to work nationwide, accounting for 60 per cent of the migrant workers returning home during the Spring Festival; thus, a considerable proportion of migrant workers had not returned to work. Taking into account the suspension of work and production and the isolation time for migrant workers before returning to work, they will have lost 30 to 60 days of work in 2020. If the risk of unemployment is considered, some migrant workers will have had to wait longer for work.

More importantly, as the impact of the pandemic on the macroeconomy gradually emerges, labour-intensive industries will be the first to be affected in the global supply chain. This is precisely the industrial sector in which migrant workers are concentrated, which will significantly increase both employment pressure and the risk of unemployment. Some export-oriented industrial parks, processing towns and enterprises experienced cancellations of orders or a significant decrease in new orders; therefore, migrant workers faced greater difficulties in returning to work (CASS, 2020).

Impacts on saving and spending of rural people

Changes in prices of food compared to the previous year

As rural households in China maintain a level of self-sufficiency, and stocked up before the Spring Festival, basic staples except for sanitation and hygiene products (masks, disinfectant, etc.) were in sufficient supply, and prices remained stable at the onset of the pandemic. Due to the subsequent lockdown policy, however, the transportation and logistical networks for basic staples, including food, were affected, causing price fluctuations in the short term.

According to the National Bureau of Statistics, from January to February 2020, consumer prices rose by 6.3 per cent for rural residents, which was 1.3 percentage points higher than in cities. Driven by the increase, the prices of rural livestock and meat rose by 90 per cent, and of rural fresh vegetables by 13.3 per cent. This situation changed in March, when consumer prices fell by 1.3 per cent for rural residents. From January to March 2020, the price of food, tobacco and alcohol rose by 14.9 per cent. The price of fresh vegetables rose by 9.0 per cent, and the price of livestock and meat rose by 80.8 per cent (including by 122.5 per cent for pork, 21 per cent for beef and 11.2 per cent for mutton). Compared to the previous month, the prices of major agricultural products showed a downward trend in March, although they had still risen year-on-year. The price of fresh fruits decreased by 5.6 per cent from January to March, and the price of eggs also fell significantly.

Foods that require immediate processing, transportation and distribution, live poultry, fresh eggs, live fish, fresh milk, fruits and other inter-village and interregional supplies were blocked, resulting in a passive reduction in rural residents' consumption; home quarantine led to a significant decrease in demand for drinks, beverages, flowers and toys. Parties, banquets,

leisure and entertainment, and other activities ceased, resulting in a corresponding decline in demand for catering and accommodation.

Affected by the Spring Festival, the prices of various vegetables, especially leafy vegetables, rise to a varying degree near the end of each year then begin to fall after the Spring Festival. Due to COVID-19, vegetables were in short supply in regional markets in 2020. With the addition of the Spring Festival holiday factor, vegetable prices in some cities have remained high (China Agricultural University, 2020).

The pandemic had various impacts on the price of food in the dairy industry compared to 2019 (CAAS, 2020h). Affected by multiple factors such as adequate stocking during the peak season of the Spring Festival and a sharp reduction in terminal consumption, dairy companies generally had a large inventory backlog in early 2020. For example, the average daily delivery of Mengniu Group's room-temperature products between 23 and 28 January decreased compared to the same period in 2019, while the average daily number of finished products (the amount that could not be sent out) increased. The total cheese inventory more than doubled compared to 2019, and the inventory of low-temperature and fresh milk products also increased significantly. Consumers have relatively high requirements for freshness; therefore, the dairy industry often offers discounts and promotions on products with a short shelf life. This is also an important reason why prices of other livestock products rose sharply during the pandemic, while prices of dairy products fell. As a whole, the supply of dairy products throughout the year was relatively loose, and the market prices were lower than in 2019.

Impacts on saving, spending and credit

Due to the impact on household income, there has been a subsequent impact on expenditure, saving and credit. Li L Y (2020) researched the influence of the pandemic on residents' consumption behaviour with a survey of 950 households in Beijing, Tianjin and Hebei. It found that the willingness to consume decreased after COVID-19 because of the expected reduction in income and the precautionary motivation to save money. Households in rural areas, those responsible for caring for elderly people, those with a lower education level and a higher proportion of consumption in income, and those without stock or insurance assets intended to reduce consumption. To keep spending patterns stable, short-term consumption stimulation measures may help maintain expenditure, but for the long term, a social safety net and support for reasonable household assets should be put in place (Li et al., 2020).

According to the survey undertaken by FAO and the CAAS, in Henan and Hubei, the vast majority of households (84.6 per cent and 90 per cent, respectively) did not have to resort to negative coping strategies to maintain their usual daily life. In these two most severely affected provinces, it appears that casual migrants were the most likely to resort to coping strategies, particularly the severest. The most frequently used coping strategies were the use of savings (6 per cent in Henan and 4 per cent in Hubei), borrowing money to buy food (up to 3 per cent of households surveyed in Hubei), and sending household members away to find work (3 per cent in Henan).

As to the impact on expenditure, according to a questionnaire and interview survey conducted in 1,183 households in China (UNDP, 2020b), nearly 10 per cent of households increased their medical and health expenditure due to the pandemic. About 80 per cent of the households surveyed used savings to cope with a decrease in income. And families in rural areas, poor households, minority households and households containing persons with

disabilities had a relatively low increase in this expenditure. This may be due to their registration in poverty reduction programmes and medical assistance policies that these vulnerable households receive regularly. About 80 per cent of the households in the survey that expected their total income to decrease in 2020 chose to use their savings as the primary way to cope with the decrease; while 8.6 per cent borrowed money from friends or relatives, and 4.6 per cent chose to reduce expenditure on food. Furthermore, reducing expenditure on food and on other goods, and borrowing money from friends or family were the three most common secondary coping measures. Generally speaking, most households dealt with the decrease in income by using their previous savings and, in addition, by borrowing money from friends and relatives, and reducing expenditure on food.

Most families purchased materials to try to prevent or control the pandemic. The proportion of rural households buying masks was smaller than that of urban residents. The proportion of non-poor households buying masks was higher than that of poor households; however, the proportion of households purchasing masks in poor villages was higher than in non-poor villages. Expenditure on children's education increased due to the pandemic, according to a UNDP survey: 39 households (3.30 per cent) installed broadband networks for their children's online learning, of which 26 (4.48 per cent) in rural areas and 13 (2.16 per cent) in urban areas, 49 households purchased mobile data, of which 30 (5.17 per cent) in rural areas and 19 (3.15 per cent) in urban areas, and 90 households (7.61 per cent) purchased mobile phones, computers and other playback devices.

Impacts on food security in rural areas

Overall food security

According to FAO (1996), "Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life."

Recently, FAO adopted the Food Insecurity Experience Scale (FIES), an indicator developed to measure access to food by asking people directly about their experience of food insecurity. The FIES recognizes that the experience of food insecurity – across the globe – tends to be incremental, starting with uncertainty and anxiety, followed by changes in the quality of the diet, which becomes less diversified and nutritious as challenges to access food increase, reaching decreases in the quantity of food consumed as portion sizes are reduced, meals skipped and hunger experienced. According to the FAO and CAAS survey, the most food-insecure households at the time of the survey were also the poorest a year earlier: smallholders and casual workers, migrant and local, were the most likely not only to be food-insecure but also to report income losses, hence the crisis hit the poorest households most severely. Among smallholders, those relying primarily on rapidly perishable products such as vegetables or fish were the most likely to report income losses, and these losses were also the most severe. Small livestock producers, on the other hand, were better able to protect their livelihoods by avoiding sales and keeping their animals at the height of the crisis, but medium-sized and large holders, who depend on more intensive production models, suffered from the rise in the cost of inputs, reporting significant losses in both poultry and pig farming.

Access to food

Due to traffic and logistical disruptions and restrictions on personal travel, fresh agricultural products such as vegetables and fruits could not be exported on time, and labour-intensive tasks such as the purchase, packaging and repackaging of agricultural products were difficult to carry out. Two thirds (67 per cent) of 107 farming households surveyed in Hubei reported that fresh agricultural products such as fruits and vegetables experienced difficult sales (CAAS, 2020h).

In terms of fruit sales, although the sales volumes of online e-commerce platforms increased, those of the main retail channels of physical stores such as supermarkets declined, and the overall volume of consumption dropped significantly. The labour costs of supermarket stores increased, and terminal sales prices rose slightly. Insufficient circulation of products led to the coexistence of shortages, stockouts and low prices (declining quality) in supermarkets. There was a backlog of goods in wholesale markets and supermarkets, and the quality of fruits declined.

The pandemic had a considerable impact on fresh food (Institute of Rural Development, Chinese Academy of Social Sciences, 2020). During the rapid spread of COVID-19 in China, some fresh agricultural products were unsellable, and the businesses suffered relatively large losses. Vegetables, meat, eggs, milk, fish, fruit, etc., mostly needed to be produced and sold; however, the period when villages and roads were closed, production was suspended, and urban and rural livestock and poultry slaughter, live poultry trading, catering establishments and bazaars were all shut down, which disrupted the supply of and demand for fresh and live agricultural products, was the usual peak consumption season; therefore, sales were extremely low, the products could not be sold in the short term, and farmers had to bear losses.

Food consumption

On the demand side, the decline in purchasing power caused by the pandemic may have changed people's diet. Slow economic growth usually leads to a decline in demand for high-priced foods such as meat and vegetable oils, but demand for basic foods such as bread and rice may increase. As seen recently in countries around the world, consumer panic can also disrupt supply chains, cause supply disruptions and affect food prices (Zhang Y M, 2020).

The economic losses and reduced purchasing power brought about by the pandemic may have led to a sharp decline in the quality of meals (Headey and Ruel, 2020). During the pandemic, the supply of fresh vegetables, fruits and meat was restricted, and prices increased, resulting in a less diverse diet and reduced nutrition. Poor people are more likely to take cheap staple foods such as rice, corn, wheat and cassava to obtain the calories they need, instead of more expensive eggs, vegetables and fruits, which are usually sources of important micronutrients.

On 12 February, the China Catering Association released data on the impact of the pandemic on China's catering industry, revealing that 15.5 per cent of the national catering revenue in 2019 came from the Spring Festival, while the sector's overall loss of revenue during the pandemic was 95.2 per cent. Under an optimistic scenario, considering the explosive growth history of the catering industry after SARS, it was estimated that outdoor meat consumption would fall by about 6.092 million tons, accounting for 7.5 per cent of the consumption in 2019. Under a pessimistic scenario, outdoor meat consumption would fall by about 7.177 million tons, accounting for about 8.8 per cent of consumption in 2019.

In terms of domestic meat consumption, Shuanghui Group's statistics on the nutritional status of 46,931 self-operated or cooperative terminal outlets found that only 35 per cent of terminal outlets were open on 13 February, and their sales declined significantly. Overall sales fell by nearly 55 per cent. Under an optimistic scenario, domestic meat consumption would fall by about 2.801 million tons, accounting for 3.4 per cent of the consumption in 2019. Under a pessimistic scenario, household meat consumption would fall by about 4.074 million tons, accounting for about 5 per cent of the consumption in 2019.

Corn and soybeans for feed were expected to experience a downward trend (China Agricultural University, 2020), since the pandemic caused the demand for meat and poultry to weaken. On the one hand, residents' consumption was based on a fear of the pandemic (animal infection), which would reduce their desire to purchase meat. It is understood that about 64 per cent of corn and about 90 per cent of soybean meal are used in the feedstuffs industry. Therefore, the pandemic caused a decline in demand for corn and soybeans (soybean meal).

Demand for refined and high-quality grains and oils was expected to increase (China Agricultural University, 2020). The emergency plans of large and medium-sized cities require stocks of a certain amount of finished grains to meet emergency needs, and the storage and transportation of finished grains and oils is more convenient. The demand for refined grains and oils will continue to increase. As people's demand for healthy food grows, high-quality grains and oils will become more popular in the market.

In terms of diversified food consumption, according to a survey of 340 households in 22 provinces, residents' basic energy intake could be met, but 21 per cent of households still reported that their diversified food needs could not be fully met. As income decreased, the level of satisfying a diversified diet also showed a downward trend (CAAS, 2020f). Among households with an annual income of CNY100,000, 80 per cent were able to consume a diversified diet. This proportion fell to 73 per cent of households with an annual income between CNY20,000 and CNY100,000, and to 61 per cent of those with an annual income of CNY20,000. Moreover, 9 per cent of households surveyed with an annual income of less than CNY20,000 were unable to meet their basic food needs, which deserves great attention.

Furthermore, the survey revealed changes in the diets of key populations such as children. The intake of fish and seafood, snacks and meat decreased significantly, and there were differences between urban and rural areas.

Child nutrition is of particular social significance, since research results show that childhood growth retardation can lead to a reduction in adult labour productivity of between 2 per cent and 9 per cent (CAAS, 2020f). An unsuitable diet is one of the main causes of malnutrition in children. Literature has shown that there are differences between urban and rural areas in the current diet of children in China. Urban children consume fewer beans and vegetables, but more meat and eggs, while rural children consume more corn, potatoes and vegetables, but less meat and seafood. Children's milk consumption is below the recommended level.

The survey found that the impact of the pandemic on children's food consumption varied between urban and rural areas. The proportion of rural children who reduced their food consumption was 1.6 times that of urban children. In rural areas, the proportion of children who reduced their consumption of fish and seafood, snacks, meat, milk, potatoes, beans, fruits and eggs was 50.5 per cent, 43.7 per cent, 37.9 per cent, 21.4 per cent, 15.6 per cent, 15.5 per cent, 8.8 per cent and 2.0 per cent, respectively. Further, 4.9 per cent of children increased their consumption of vegetables, and 2 per cent increased their consumption

of grains. In cities, the proportion of children who reduced their consumption of fish and seafood, snacks, meat, beans, potatoes, vegetables, cereals and milk was 40.1 per cent, 23.2 per cent, 20.7 per cent, 17.7 per cent, 10.6 per cent, 2.5 per cent, 2.1 per cent and 2.1 per cent respectively.

TABLE 4: Comparison of changes in food consumption of urban and rural children affected by purchase restrictions

Food category	Rural areas (%)	Cities (%)
Fish and seafood	-50.5	-40.1
Snacks	-43.7	-23.2
Meat	-37.9	-20.7
Milk	-21.4	-2.1
Potatoes	-15.6	-10.6
Beans	-15.5	-17.7
Fruits	-8.8	0
Eggs	-2	4.2
Vegetables	4.9	-2.5

Data source: Chinese Academy of Agricultural Sciences. 2020b. Impact of COVID-19 on China's food supply system and residents' food consumption structure. Report No. 29. Beijing: CAAS.

Impact on poverty in rural areas

In general, the pandemic has had a limited impact on the continued efforts to eliminate poverty. Provinces with a high incidence of poverty were the areas least affected, but the remaining poverty alleviation efforts in areas with severe epidemics were still relatively arduous (CAAS, 2020d). Although the pandemic had many adverse effects on the local economy, a questionnaire and interview survey conducted in five provinces with high poverty rates in China (Hunan, Gansu, Henan, Sichuan and Hubei) found that no additional households would fall into poverty due to the pandemic, and those previously living in poverty would still be able to move above the poverty line (UNDP, 2020b).

However, a report by the World Bank declared that in China, the risk of falling into poverty was particularly high among informal sector and self-employed workers who lack paid sick leave or other forms of social protection, as well as migrant workers who may have a more precarious employment status and may have been unable to return to their place of work due to lockdown measures. Across the region, workers linked to sectors that experienced strong demand shocks, such as tourism, or value chain disruptions, such as manufacturing, also faced an increased risk of falling into poverty. Simulations suggest, for example, that if households in the tourism and retail sectors in China experienced a 50 per cent income loss for two quarters, their poverty rate would increase by 12 percentage points (World Bank, 2020).

To be more specific, in terms of the severity of COVID-19, the seven provinces with the highest incidence of poverty – Guangxi, Guizhou, Yunnan, Tibet, Gansu, Qinghai and Xinjiang – all had relatively mild epidemics. None of these seven provinces is the main grain producer, but Guangxi is the main consumer of poultry; Tibet, Gansu, Qinghai and Xinjiang are the main mutton producers; Yunnan is the major producer of fruits and horticultural products; and Guizhou has the eighth largest number of migrant workers. Therefore, there have been certain impacts along the value chain, differing by product and province.

On 16 February, a total of 732 cases were diagnosed in these seven provinces, accounting for only 1.07 per cent of the total number of confirmed cases nationwide, and 5.93 per cent of the total number of confirmed cases outside Hubei province. However, interviews revealed that disease prevention and control tasks in rural counties still required great attention. Compared with other regions, there is a lack of public medical and health resources in these impoverished counties. The remaining poverty alleviation efforts in areas with severe epidemics are still relatively arduous. On 16 February, there were seven provinces with a total of more than 900 confirmed cases nationwide: Hubei, Guangdong, Henan, Zhejiang, Hunan, Anhui and Jiangxi. Guangdong and Zhejiang have no poor population, and, although the incidence of poverty in the other five provinces is not high, the overall size of the remaining poor population is still large, accounting for about one seventh of the country.

The interviews revealed that some areas with severe epidemics had to shelve poverty alleviation work in the short term, and in the long term they will divert poverty alleviation resources due to the pandemic. The longer the pandemic lasts, the greater the pressure on poverty alleviation efforts. There is great pressure to lift poor people out of poverty, but the pandemic has presented several challenges.

First, the main source of many people's income dried up. The pandemic had a great impact on businesses and wage income. Due to the combined effects of insufficient supply of agricultural materials, restricted product sales channels and suppression of demand, poor people's production and operation activities were significantly affected. Many poverty alleviation workshops suspended work and production, making it difficult for people to go out to work, especially in major labour exporting provinces such as Henan, Anhui, Hubei and Sichuan. The survey found that more than 80 per cent of the farmers who went to work in previous years had not yet returned to work. However, the impact of the pandemic on property and transfer income was relatively weak.

Second, solving the "three guarantees" issue is still difficult. In some places, drinking water safety improvement projects and relocation projects for poverty alleviation have been delayed. Education required online teaching during the lockdown, but teachers in rural areas have low levels of information technology and lack computers and network hardware. A new gap in teaching quality emerged. In the face of sudden epidemics, the primary health-care system generally exhibits problems such as insufficient capacity and insufficient reserves, leading to certain negative impacts on an already weak system.



POLICY SUPPORT AND COPING STRATEGIES OF RURAL HOUSEHOLDS IN RESPONSE TO THE COVID-19 PANDEMIC

©IFAD/Peter Ekblad

Government policy support

Restoring market function and connectivity for agriculture

In January 2020, facing the outbreak of COVID-19, the primary policy consideration was to ensure people's health. On 29 January, the State Council urgently deployed personal protective equipment companies to resume work and production. Companies were required to report timely data on production capacity and product inventory to cooperate with the government's unified management and allocation of emergency prevention and control materials. On 30 January, the Ministry of Agriculture and Rural Affairs urgently emphasized the strict implementation of the "Green Channel" system to ensure the normal distribution of "vegetable basket" products and agricultural production materials. In February, the Ministry of Commerce required local commercial and financial authorities to support in-depth collaboration between distributors of agricultural products and new agricultural business entities within two years to build a modern agricultural product supply chain, and asked them to support distributors of agricultural products to do emergency supply work.

The specific policies to ensure stable supply and production included: 1) promptly initiating emergency monitoring of prices of important basic commodities, prompt early warning and timely disposal; 2) increasing efforts to resume work and production, and

increasing the supply of important agricultural products; and 3) guiding local departments to direct commercial enterprises to increase commercial inventories, thereby increasing local reserves of daily necessities.

Timely, open and transparent reporting of a crisis can reduce people's panic, worry and doubts. Electronic platforms should be used to respond to the needs of the public by providing timely and highly accurate data. The public's engagement should be integrated into policy adjustments, and online communication and exchange between the government and the public should be continuously strengthened. While strengthening the credibility of the government, effective communication should enhance trust in the government and build public solidarity. Further, social forces should be activated to encourage citizens to consciously participate in policies. Professional and authoritative experts can reassure the public about disease prevention and control, and the social strength of non-governmental organizations and groups can enhance interpersonal and social trust, and their unity and cooperation are important.

In March and April 2020, in response to spring farming during the pandemic, the Ministry of Agriculture and Rural Affairs instructed all regions to restore agricultural production in different regions to ensure that spring ploughing and preparation were not missed during the farming season, and the acreage sowed with grain was regarded as a binding indicator for local governments to ensure the stability of grain production for the whole year (Ministry of Agriculture and Rural Affairs, 2020a).

In such situations, it is important to reactivate the flow of people and logistics on time, and support the production, transportation and supply of agricultural production materials. Grain planting subsidies, rewards and other funds were put in place to mobilize farmers' enthusiasm for production, and guide farmers or new agricultural business entities to work in the fields.

Strengthened agricultural technical support to rural areas. Under the premise of personal protection, local agricultural technology departments organized experts and technicians to conduct field classes and provide on-site guidance on key technical aspects of production. Make full use of the internet such as through WeChat groups and video conferences to provide agricultural production information and technical guidance, and increase scientific guidance on-field management, plant disease prevention and other production technologies.

Accelerate the construction of high-quality farmland. By carefully scheduling materials and construction machinery and vehicles, ensure that construction equipment and materials enter the site on time; strengthen communication and coordination with village groups and farmers to ensure that workers arrive at work easily; flexibly adopt subcontracting and subprocess parallel construction. In this way, priority should be given to the construction of access roads, water conservancy projects and other projects that may affect agricultural production in spring, to ensure the priority construction of high-quality farmland (Ministry of Agriculture and Rural Affairs, 2020b). Actively organize the implementation of high-yield and high-efficiency planting models to accelerate the integrated development of the agricultural industry chain.

Promoting alternative coordination and innovation chains

In January 2020, when the pandemic constituted a state of emergency, the State Administration of Market Supervision tried to regulate market prices by requiring all market supervision departments to strictly and promptly crack down on illegal activities such as price collusion, profiteering and price fraud by a few operators. In February, the government emphasized the importance of market monitoring, supply loading and transportation, and helping distribution

companies solve practical problems. Recommended policies included: 1) simplifying the materials and procedures required for import and export enterprise licences; 2) supporting the development of new formats and models of foreign trade; 3) strengthening export credit insurance support; 4) actively responding to overseas trade restrictions; 5) deepening the innovative development of trade in services; and 6) encouraging enterprises to make good use of preferential policies in free trade agreements.

Cultivate new forms of agricultural product sales and improve the efficiency of production and sales. In March, in response to problems in product circulation, the policy emphasized the need to strengthen the informatization and organization of production and sales, effectively link production and sales information, achieve precise supply, reduce intermediate links and improve the operational efficiency of the supply chain. Support agricultural product distribution enterprises to ensure emergency supplies. Strengthen material reserves, and logistics and distribution, and stabilize market expectations and agricultural product prices. In April, facing the increasingly severe situation of foreign epidemics, the Ministry of Commerce fully supported foreign-funded enterprises to restore normal production and operations, and promoted higher levels of opening up.

Actively promote the development of rural e-commerce, reduce the backlog of agricultural products, and optimize the supply of agricultural products. Support the use of e-commerce platforms, short videos, live broadcasts and other means to expand the agricultural product consumption market, use the flow economy to increase the visibility and influence of agricultural products, and expand the channels for online and offline sales of unsellable agricultural products, thereby increasing sales. The 6,000 Sinopec petrol station Yijie convenience stores in 126 prefectures and cities temporarily increased their vegetable sales business, meeting the urgent needs of some enterprises and farmers that had no other route to market.

Strengthen market supervision. Create a safe and secure consumer environment, strengthen market supervision, and regulate market prices. Adhere to the principle of territoriality and joint guarantee and supply, the principle of market and government guarantees, and the prevention and control of the disease and the guarantee of supply. From the outbreak of COVID-19, the government established a daily tracking and monitoring system for more than 50 key agricultural product wholesale markets across the country, focusing on important daily items such as rice, flour, meat, milk and vegetables, by undertaking thorough investigations, strengthening early-warning monitoring, and strengthening material reserves to complete the task of guaranteeing supplies in key cities with measures such as transportation and mobilization of all parties (General Office of the Ministry of Commerce, 2020).

Strengthen the analysis of production and sales of livestock, poultry and seafood, give full play to the role of industry associations, establish a platform for production and sales, collect and release production and sales information, guide timely and accurate loading, and solve the problems of “unsellable” and “unavailable” products. Strengthen scientific evidence and correct guidance on the consumption of poultry products to promote the return of market consumption to normal (General Office of the Ministry of Agriculture and Rural Affairs, General Office of the National Development and Reform Commission, and General Office of the Ministry of Transport, 2020).

Resolve the problem of poor local logistics and ensure the supply of daily necessities. According to the requirements of the Ministry of Commerce to guarantee the supply of daily necessities across the country, speed up the coordination and resolution of outstanding problems

such as poor logistics and employee shortages in the daily necessities market, and smooth the export channels for the storage and transportation of vegetables and other agricultural products. In response to the increase in the demand for concentrated return trips, the focus is on guiding large and medium-sized cities to increase the transportation and replenishment of agricultural products. Some large agricultural product wholesale markets attract merchants to operate by reducing or waiving transaction fees and field rental fees.

Assistance to key agrifood stakeholders

Reduce taxes and fees to reduce the costs of agricultural enterprises. During the difficult period of the pandemic, the policy stipulated, for a certain period, the implementation of phased tax and fee reductions, reductions and exemptions of five types of insurance and one housing fund, financial discounts and the exemption of agricultural insurance premiums⁴ to help agricultural enterprises, especially small and medium-sized businesses and microenterprises, to survive and steadily resume normal operations. The main preferential tax policies for enterprises included a policy that was quickly introduced in February 2020 to reduce the corporate income tax and value-added tax of agricultural enterprises that provided key guarantees for the prevention and control of the disease, and the longest carry-forward period for agricultural enterprises affected by the pandemic in 2020 was extended from five years to eight years.

The central government's agricultural development funds will target areas with severe epidemics, increase the overall planning of local financial funds, expand the scope of financial support, accelerate the allocation of disaster relief funds for agricultural production, and urge and guide cities to allocate the 2020 special poverty alleviation funds issued in advance by the central government and poverty alleviation funds arranged by local governments into projects promptly, and give priority to support the completion of poverty alleviation efforts related to disease prevention and control (Poverty Alleviation Office of the State Council and the Ministry of Finance, 2020).

Poverty alleviation projects include the following: 1) improving the construction of productive infrastructure such as flood control facilities, water conservancy irrigation and access roads; 2) accelerating the application of mechanized agricultural production technology and promoting the development of agricultural modernization; 3) prioritizing support to deeply impoverished areas such as counties that have not been lifted out of poverty and the "three districts and three states"; and 4) for projects such as establishing strong agricultural industrial towns and modern agricultural industrial parks, application requirements shall be appropriately relaxed, and priority shall be given to counties that have not yet been lifted out of poverty.

In March 2020, in response to the high costs of logistics companies affected by the pandemic, the urban land use tax on the land used by logistics companies for bulk commodity storage facilities was reduced by 50 per cent. In terms of financial support policies for agricultural products such as poultry meat, the role of local government special bonds should be fully utilized, investment support within the central budget should be increased, and financial means such as credit, tax incentives and financial discounts should be used comprehensively to help poultry companies experiencing financial difficulties to survive. To effectively reduce the financing costs of small and medium-sized farms and further promote the recovery of live pig

⁴ On 18 February 2020, at the executive meeting of the State Council, multiple measures were taken to support enterprises and stabilize employment.

production, the central government expanded the scope of temporary loan discount subsidies from farms with more than 5,000 pigs to those with more than 500. Temporary loan discounts are a universal policy, and all eligible loans enjoy a financial discount.

Recommendations for alleviating the financing problems of rural small businesses and microenterprises include the following. First, to increase credit for rural business entities, the government focused on strengthening financial support for credit from financial institutions in April 2020. Government-controlled financing guarantee and re-guarantee agencies actively increased credit for small businesses, microenterprises and rural business entities, reduced guarantee rates, increased the proportion of guarantee support for rural small businesses and microenterprises, and combined online and offline channels to optimize loan efficiency.

Second, provide financial services such as preferential credit and deferred loan repayments for agricultural enterprises in difficulty. Third, actively coordinate and promote the implementation of credit support policies such as special refinancing of key enterprises to ensure the prevention and control of the pandemic, preferential refinancing of small and medium-sized businesses and microenterprises to enable them to resume work and production, and deferred debt and interest payments. Coordinate financial institutions to strengthen support to key agricultural and other industries. Fourth, the government will give one-time production subsidies and loan interest subsidies to poverty-stricken entities such as leading poverty alleviation enterprises and cooperatives that actively support poverty-stricken households during the pandemic. Fifth, encourage large, market-leading enterprises to use the financing they obtain to develop supply chain finance and pay cash to upstream and downstream small and medium-sized businesses and microenterprises in the form of advance payments to promote common development.

Integrating crisis management with the poverty reduction agenda

From the beginning of the outbreak, the government attached great importance to the promotion of disease prevention by educating and guiding farmers, especially poor households, to establish concepts of health, develop good hygiene habits, abandon the bad habits of overconsumption of wild animals, achieve scientific prevention measures and improve self-protection capabilities. Village teams play an important role in disease prevention and poverty alleviation, and carry out their work with village groups and families. The government must effectively interpret poverty alleviation policies and respond to public opinion and social concerns promptly. Innovative communication methods should be used to widely publicize good examples and moving stories of poverty alleviation during the disease prevention and control period, and to develop a positive energy for poverty alleviation.

In response to the problems of people in difficulty during the pandemic, the government issued a policy in March 2020 to emphasize basic social protection for people in difficulty, establish a monitoring and assistance mechanism to prevent people falling back into poverty, and ensure basic care and services for people in particular difficulty. To ensure that people in difficulty had access to help and received assistance on time, all localities were required to publish help hotlines for help, simplify work processes, improve the referral mechanism, clarify the main responsibilities, and ensure timely response to people in need of help (Central Leading Group for Response to the Epidemic, 2020).

Examine and train cadres in disease prevention and control, and poverty alleviation. It is necessary to overcome problems of formality and bureaucracy, work hard to reduce the burden on the grass-roots level, and concentrate on disease prevention and poverty alleviation. It is

necessary to pay attention to poor people's livelihoods and lives, strengthen psychological interventions and guidance, and provide targeted humanitarian care. It is necessary to care about the work, life, and physical and mental health of grass-roots poverty alleviation cadres, to enable them to do a good job in disease prevention and safety, and to help them solve practical difficulties.

In April 2020, in response to the difficulty in selling agricultural products in poor areas, the government strengthened the precise connection between poor areas and residents of large and medium-sized cities. It is important to take advantage of the resource and ecological advantages of poverty-stricken areas, organize the supply of poverty alleviation products, ensure the quality of agricultural products and food safety, and accurately meet the needs of residents in eastern regions and large and medium-sized cities for high-quality and safe poverty alleviation products, to achieve complementary advantages and mutual benefit.

Another effort is poverty alleviation through enhanced consumption. A pair-wise measure has been taken into place through collaboration between the east developed and the west developing areas. Products produced in west areas were sold to east areas which enlarge the market channel for the products and enhanced consumption in east areas. (Poverty Alleviation Office of the State Council and Central Cyberspace Administration of China, 2020).

Strengthening employment opportunities by networking local businesses

Following the prevention and control requirements introduced in response to the pandemic, the government guided counties with many migrant workers to formulate detailed plans for resuming work and employment. By deploying a joint prevention and control mechanism, based on "orderly staggering in batches", priority was given to organizing poor labourers to return to or go out to work. Work initiatives such as the east-west poverty alleviation collaboration were used to strengthen the effective connection between the exporting and importing regions (the State Council Leading Group of Poverty Alleviation and Development, 2020).

Clarify the standards for the resumption of production. Refine the disease prevention and emergency response measures after the resumption of production, coordinate and guarantee the supply of disease prevention materials required for resumption of work, optimize and simplify the approval process for resumption of production, and guide qualified enterprises to start construction in an orderly manner. Use means such as "online, handheld, post and appointment" and other effective means to further reduce the time and cost of business registration; implement special procedures for the registration of enterprises that produce personal protective equipment and hygiene products; establish emergency fast-tracking for administrative licensing; and extend the administrative licence period.⁵

Organize qualified migrant workers to return to work safely. The government should work with health departments, public security departments and transportation departments to take measures such as chartering transportation and providing training on isolation and protection to organize migrant workers to return to work safely. In line with the State Council's joint prevention and control mechanism, public transport and stations should be disinfected and sanitized, and the temperature detection of passengers at passenger stations should be strengthened. After

⁵ According to the 10 policy measures to support the resumption of work and production jointly issued by the State Administration for Market Regulation, the State Drug Administration and the State Intellectual Property Administration during the critical period of the epidemic on 15 February 2020.

the pandemic has been controlled to a certain extent, coordinate the promotion of disease prevention and economic development, adhere to a combination of emergency response and normalized prevention, and promote the orderly resumption of work and production of agricultural enterprises.

Implement employment support policies. According to the measures taken by the Ministry of Agriculture and Rural Affairs and the Ministry of Human Resources and Social Security to stabilize employment during the pandemic, the policy arrangements for March 2020 mainly included the following:

- Implementing financial, tax, and credit support policies to absorb migrant workers: One-time entrepreneurial subsidies will be given to entrepreneurs who have returned to their hometowns and stayed in their hometowns to start a business for the first time and have been in business for more than one year. Interest discounts will be applied to eligible guaranteed loans for returnees and residents to start a business or to incentivize enterprises to expand their workforce.
- Supporting enterprises to absorb migrant workers in flexible, shared or part-time employment through flexible and diverse forms of work such as temporary, seasonal or flexible employment.
- Actively developing the productive service industry, primary processing of agricultural products, leisure and tourism, and life service industries, and attracting migrant workers to find employment in the front and back ends of agriculture and rural areas.
- Improving the public release platform for job information, carrying out vocational skills training, and organizing online and offline diversified employment guidance.

Restore the transportation and express delivery industry. The pandemic had a major impact on transportation. To support the transportation, express delivery and other logistics industries in alleviating difficulties and resuming development, the government launched a series of measures in March 2020: 1) the exemption of value-added tax on income obtained from the transportation of key disease prevention materials; 2) from 1 March to 30 June, waiving import and export cargo port construction fees, reducing cargo port fees, port facility security fees and other government pricing charges by 20 per cent, and abolishing non-tank tanker mandatory emergency response services and charges; and 3) before the end of June, halving the fees for railway insured prices, delayed use of containers, and detention of trucks.

Adhere to the goal of eliminating absolute poverty

China's eradication of absolute poverty was accomplished in 2020. The country has made many efforts to eliminate absolute poverty and has achieved remarkable results. Even during the COVID-19 pandemic, it still insisted on eliminating absolute poverty as its main objective. In November 2020, with the elimination of absolute poverty in the last and most difficult 52 deep poverty-stricken counties, China successfully met the poverty reduction goal of the United Nations 2030 Agenda for Sustainable Development 10 years ahead of schedule.

China has adopted comprehensive and targeted poverty reduction measures to eliminate absolute poverty, including coordinated poverty alleviation in the east and west of the country, targeted assistance and special poverty alleviation initiatives. They include comprehensive

policy preference for poor areas, sending trained personnel, and effectively combining rural infrastructure investment with social and economic sector investment. Through investment of public resources, private investments are driven into rural areas. Through the adequate allocation of finance, transfer payment subsidies and other resources, the main industries have developed well in poor areas, fully mobilizing the enthusiasm of farmers in production, promoting poverty alleviation, and injecting long-term vitality into the development of poverty-stricken areas.

In the difficult period at the onset of the pandemic, poor farmers were particularly vulnerable to risks. Travel restrictions and the suspension of business activities at the height of the pandemic had a negative impact on the income of poor farmers and increased the difficulty of eliminating absolute poverty. In response to the crisis, China improved its poverty alleviation programme, prioritized ensuring that everyone enjoyed at least basic living conditions, consolidated the achievements of poverty alleviation and ensured that the pandemic would not have a long-term impact on poverty alleviation. Through scientific prevention and control, and by steadily restoring agricultural production, unblocking logistical congestion, developing rural e-commerce, increasing investment in key rural infrastructure and expanding financial investment, China built a solid foundation for eliminating absolute poverty. Due to the response measures introduced during the pandemic, the rural economy has been able to recover and develop steadily since April 2020.

To reduce the pandemic's negative impact on the goal of eliminating absolute poverty in 2020, the following key measures were taken: 1) coverage of minimum income security was appropriately expanded, and cost of living subsidies were increased to help improve poor people's standard of living; 2) medical care, compulsory education, housing, travel and safe drinking water were improved; 3) stabilization of market participation, creation of employment opportunities and provision of job opportunities for poor areas through infrastructure investment and poverty alleviation projects; 4) promotion of the steady development of traditional and advantageous industries in poverty-stricken areas, and improvement of the ecological environment; and 5) to make up for the weaknesses in the actual situation of poor areas, enhancement of the endogenous development momentum of poverty-stricken areas and of the sense of happiness of farmers. For the transformation and upgrading of advantageous industries in areas with high rates of poverty, policies need to focus on opening up logistics, sales and service systems, and developing rural e-commerce.

China has made remarkable achievements in eradicating absolute poverty, but it will also face many new challenges. For example, relative poverty will exist for a long time, some poor people are still at risk of returning to absolute poverty, and the stability of poverty reduction achievements needs to be consolidated. The fertility rate is falling, and the demographic dividend is gradually disappearing. Too many public resources are being invested in poverty reduction, and sustainability is limited. Furthermore, rural employment opportunities are insufficient, and environmental pollution is more serious than ever. To meet these challenges, it is necessary to make rational use of public resources, improve farmers' skills, increase poverty alleviation investment, reduce environmental pollution, reduce the gap between urban and rural areas, and increase rural employment opportunities.

Rural communities and alternative networks

Community-based adaptation and social networks

In the early stages of the pandemic, mitigation resources were in short supply, and it was difficult to perform tasks such as publicity, education, disinfection, testing and guidance in rural areas. Under the leadership of local governments, rural cooperatives used their organizational, networking and circulation advantages to assist in disease prevention. Agricultural machinery cooperatives used their agricultural machinery such as drones and pesticide spraying vehicles to participate in the disinfection of village streets to reduce the risk of infection.

The cooperatives organized villagers to carry out fixed and mobile epidemic testing and supervised members to perform effective disease prevention and protection activities, which greatly eased the pressure on rural grass-roots organizations. Some cooperatives with stronger capabilities responded to the government's call to shift production and operations to the production of urgently needed supplies for disease prevention. Many cooperatives actively mobilized members from all over the world to find resources, donate protective materials, and provide fresh vegetables and food to front-line personnel such as doctors, police officers and community workers, which effectively alleviated the problem of insufficient resources to respond to the pandemic.

While responding to the pandemic in rural areas, the daily lives and health of farmers were greatly affected. The unity, cooperation and mutual assistance among members of rural cooperatives eased farmers' worries about the pandemic and enhanced their confidence in the response. The main activities of cooperative members included donations of materials, disinfection, household inspection, on-duty prevention and control, and guaranteeing supply. By participating in the response to the pandemic, cooperative organizations enhanced their social reputation, which is conducive to the expansion of their business scope and interaction with government departments, thereby increasing the coverage of agricultural social services. Rural cooperatives have thus demonstrated that they are the backbone of rural public services and can play a greater role in rural revitalization.

Crisis communication, public awareness and collective action

Assist Communist Party of China branch committees and villagers' self-government committees in village organizations to distribute information about disease prevention. In the face of the sudden pandemic, farmers generally did not know how to respond. By distributing disease prevention information materials, hanging up banners and organizing villagers to carry out fixed and mobile testing, farmers were urged to protect themselves. Farmers' cooperatives used social media platforms, WeChat groups and other channels to send scientific knowledge of disease prevention requirements to their members, and to instruct members not to believe in rumours, not to spread rumours and to resolutely resist and correct the spread of rumours. Moreover, they also restrained members from going out or visiting friends, and promoted frequent handwashing. The effect of their reminders and instructions was remarkable. Through publicity and education, farmers were able to quickly form a consensus on actions and fully obey the organization's recommendations, thereby effectively alleviating the pressure on disease prevention and control of the village "two committees".

Strengthen thematic publicity and education on the resumption of production in rural areas. After the initial emergency stage of responding to the pandemic without going outside, cooperatives regulated various aspects of the agricultural production of their members and were ready to ensure a stable resumption of production.

Other recommended measures include the following:

- Inform people of the harm of pathogens carried by wild animals to human health and strengthen warnings.
- Guide farmers to establish scientifically based food consumption concepts and values, and cultivate healthy eating behaviours.
- Instruct cooperative members not to purchase, transport or sell wild animals or their products from unknown or illegal sources.
- Strengthen the prevention and control of animal diseases, ensure effective disinfection and elimination of pathogens in breeding farms, designated slaughterhouses and other places, and strictly follow the regulations to treat dead animals and livestock safely.
- Strengthen the recognition of exceptional performance in the response to the pandemic. By commending outstanding individuals for their performance in the response to the pandemic, the power of example can drive the majority of cooperative members to actively contribute to the collective, while the promotion of exceptional performance will allow the community of farmers to feel the collective warmth, thus enhancing social solidarity.

Many cooperatives have seen new opportunities in the health industry emerge from the pandemic, and have conveyed modern agricultural concepts such as green, organic and smart agriculture to their members to prepare for the transformation and upgrading of agriculture. This not only improves farmers' agricultural knowledge and skills, but also brings confidence and security to farmers, and promotes harmony and stability in rural areas.

Farmer organizations as the coordinator to cope with disruptions

In the early stages of the pandemic, farmers' cooperatives focused on preventing and controlling the spread of COVID-19 while at the same time focusing on production and supply, and resolutely ensured the effective supply of "vegetable basket" products, especially the effective supply of agricultural products in the affected areas, to achieve high quality and stable prices. Under the guidance of the local government and agricultural and rural departments, rural cooperatives in various regions learned about the supply of and demand for major agricultural products, organized their members to resume work and production, promoted stable production, and ensured the production and market supply of important agricultural products such as vegetables, grains and oils. They effectively met the basic living requirements of the people and laid a solid foundation for coping with the impact of the pandemic. Despite comprehensive prevention and control measures, rural cooperatives in various regions successfully completed the preparation and supply of spring agricultural production seeds, seedlings, fertilizers, agricultural films, pesticides and other materials, ensuring the orderly development of spring agricultural production.

Other recommendations include the following:

- Organize members to carry out agricultural operations in an orderly manner.
- Reduce farmers' concentrated operations and large-scale gatherings of people.
- Organize farmers to conduct farmland operations in batches or slices and through time-sharing.
- Perform effective maintenance of agricultural machinery and agricultural facilities to ensure normal use during spring ploughing.
- Develop green and standardized agricultural production. Cooperatives with certain strengths have seen opportunities for the development of green agriculture. At the stage when agricultural production is steadily recovering, it will be equipped with newly built, rebuilt or leased cold chain, storage, grading, packaging and other primary processing equipment, and refrigerated facilities. Carry out the commercialization of origin. Develop green and efficient characteristic planting and breeding industries, develop branded green agricultural products, create standardized production bases, and gradually expand into the processing, distribution and marketing stages of the supply chain.

Rural community to harness trust and credibility

Cooperatives are economic organizations that rely on physical industries, which can effectively lead small farmers to participate in the development of modern agriculture. Compared with enterprises, they have stronger public welfare attributes; compared with family farms, cooperatives are more organized. Under the guidance of policies, rural cooperatives give full play to the organization and leading role of members, guiding them to be honest, not hoarding, not driving up prices, operating according to laws and regulations, and maintaining a fair market. For cooperatives that do not have a response when a pandemic occurs, it is common for their working practices to be inflexible or for their leadership ability to be insufficient. The common practice is to adjust the operating practices or even form larger cooperatives through mergers and alliances to improve their ability to deal with market risks.

Strengthen compliance with the quality and safety requirements of agricultural products. Strengthen communication and education on quality and safety to members to raise their quality and safety awareness and help them meet agricultural production standards. In terms of scientific and technological training, help the growers in the network to prepare for spring ploughing, and agro-technical experts will systematically explain the varieties suitable for planting, fertilizer selection, high-yield cultivation techniques, and pest control through live web broadcasts.

Build a learning platform to strengthen online learning during the pandemic. Professional and technical personnel can provide one-to-one, peer-to-peer online technical guidance to farmers, and can also record related technical videos and then publish them on related professional websites or app platforms for farmers to repeatedly learn and practise.

Strengthen the process management of planting and breeding to ensure the quality and safety of agricultural products. Actively carry out quality inspection of agricultural products, and resolutely prevent products with excessive pesticide residues from entering the market. Various planting and breeding cooperatives should actively expand upstream and downstream activities to integrate planting, breeding and sales into one, and consequently promote the integrated

development of the agriculture industry. Through innovative business models, cooperatives can provide farmers with more standardized production, technological and marketing services, which not only promotes their development but also enables farmers to obtain more benefits from development. Also, the cooperatives should select high-value-added agricultural products to produce based on market demand, and improve the quality of agricultural products in terms of planting and breeding technology and management technology.

Cooperatives should actively develop new business models. In response to the problem of falling income, many cooperatives strictly control costs and expenditures to maintain steady operations, and help their members to seek benefits and solve difficulties. In the face of catastrophic disasters, cooperatives can use their comparative advantages to serve their members, build confidence among farmers, attract more farmers to participate and, therefore, expand their regional influence. Further, the pandemic will force cooperatives to regulate their operations, increase the centripetal force of their members, and enhance their ability to resist risks.

Hybrid forms of agribusiness through rural communities

Rural communities and farmer organizations should connect with key urban vegetable marketing entities, strengthen communication of market information, establish a stable supply and sales relationship, build a precise and peer-to-peer connection between the production area and sales areas, accelerate the orderly and rapid distribution of agricultural products, alleviate agricultural product sales problems, and use “production area + e-commerce platform + terminal consumers” as the main online agricultural product sales model.

The cooperatives provide an online supply of agricultural products through cooperation with major e-commerce companies such as Alibaba and JD.com, which serve as a convenient bridge between small farmers and the larger market. On 20 February 2020, the Ministry of Agriculture and Rural Affairs collected information on the supply of fruit products from 1,334 farmers’ cooperatives and published it in the pandemic column of its official website. This was a useful attempt by the government to promote in-depth cooperation between cooperatives and the market.

During the pandemic, making full use of online resources to develop customers became an effective way to cope with the problem of poor sales of agricultural products and the difficulties that cooperatives experienced maintaining a small margin. Turn rural vegetable greenhouses, fruit gardens and breeding facilities into “live broadcast studios” and organize rural grass-roots cadres and farmers to sell agricultural products through e-commerce live streaming. Collect residents’ demand for agricultural products through WeChat Moments, WeChat groups, WeChat official accounts, and WeChat fruit and vegetable ordering mini-programs, and adopt online ordering and community-based centralized distribution to strengthen the direct connection with customers, minimize personal travel and reduce the risk of contagion. Many cooperatives have begun to build online shopping malls, which consist not only of local agricultural products but also the agricultural products that are typical of many provinces across the country.

When there are travel restrictions that affect the efficiency of distribution, it is important that cooperatives actively communicate and coordinate with relevant government departments to discuss reasonable solutions. Relying on the dual forces of the government and the market to provide temporary subsidies for large-scale agricultural product wholesale markets, large and medium-sized commercial distribution companies and rural brokers should issue green passes,

deliver in the nearest community, make every effort to overcome obstacles in the transportation process, and continuously optimize and adjust operations to ensure timely and efficient delivery of agricultural products to their destination.

Agribusiness adaptation and innovation

From business to social responsibility: Chinese enterprises in the pandemic

Orderly resumption of work and production in batches. Considering the enterprises' own characteristics, and following the requirements of the State Council for the resumption of work and production of enterprises, all small and medium-sized agricultural enterprises should formulate appropriate, scientifically based measures to conscientiously prevent and control the spread of the disease, such as through testing and screening before the resumption of work, commuting guarantees and personal protection.

Arrange the return and temporary job rotation of employees. In addition to necessary production personnel, try to arrange online office work to reduce staff gathering and contact. At the same time, monitor daily online attendance, establish a system of liability, and set out performance evaluation goals to ensure the efficiency of the off-site office and the safety of on-site production. All enterprises should strengthen their guidance on and supervision of disease prevention, supervise employees to perform quarantine inspections and health assessments, report disease information promptly, implement various prevention, control and service guarantee measures, try to ensure the supply of disease prevention materials needed for the enterprise to continue production, and publicize the importance of disease prevention among employees.

Strengthen communication with local governments, and develop a disease prevention plan to enable migrant workers to return to the workplace. In low-risk areas, adopt a "point-to-point, non-stop" way of chartering cars and aircraft to help migrant workers return directly to work. Strengthen disease prevention communication for returning migrant workers, and show them how to prevent and control the disease. Prepare for the normalization of the response to the pandemic, maintain a sense of responsibility for prevention and control, and remain vigilant. Strictly check the health guidance and measure employees' body temperature, especially those returning from medium- and high-risk areas or abroad. Enterprises should ensure that their health management, isolation measures and body temperature monitoring are carried out carefully.

Strengthen health and safety measures. Pay attention to staff training on disease prevention and control, and strengthen communication about the pandemic in offices. Organize and carry out various forms of prevention and control training and public education to improve employees' self-protection awareness and ability, which can combine occupational health training and education, warning notification, and other systems. Also, pay attention to protection in the production process. Ventilate the workplace to keep indoor air circulating. Ensure that staff wash their hands and rinse their eyes frequently. Clean and disinfect surfaces in the workplace, and keep the environment of work clothes, staff dormitories, auxiliary sanitary facilities and canteens clean and well ventilated. Further, establish an emergency response mechanism for the pandemic. Set up an isolated observation area. When employees display suspicious symptoms such as fever, fatigue and a dry cough, the nearest doctor should be called quickly. Under the guidance of professionals, enterprises should disinfect their workplace and the equipment they have used.

Emergency technological innovation and intensified technological transformation. During a severe pandemic, if there is a shortage of essential materials, some enterprises should actively transform their production lines to produce anti-pandemic materials and carry out technological transformations to improve production efficiency and increase capacity. Carry out the necessary scientific and technological innovation related to the pandemic, and actively cooperate with relevant capital and enterprises to accelerate the formation of commodity-level applications and form effective production capabilities.

Developing resilience and looking for transformation

Small and medium-sized agricultural enterprises experiencing operational difficulties due to the pandemic should actively apply for policy support from the government (such as rent reductions, tax reductions and exemptions, and postponement of social security contributions), control office expenditures and reduce daily expenses to ensure their normal operation. The pandemic has presented many challenges to agricultural enterprises, while also stimulating small and medium-sized agricultural enterprises to work hard to unify their business ideas, form product advantages, increase innovation, improve capital guarantees and strive to improve their resilience. High-tech agricultural enterprises enjoy preferential taxation and social security policies, but in the context of disease prevention, the most important thing is to improve their production and operational capabilities on their own.

The pandemic has had a greater impact on small businesses and microenterprises than on medium-sized and large enterprises because smaller enterprises have insufficient capacity to cope with such crises. In such an unfavourable situation, small and medium-sized agricultural enterprises should pay attention to tapping their potential, quickly adjusting their industrial layout and optimizing their product structure. They should also accelerate the promotion of online sales and transformation, strengthen cooperation with e-commerce and communities, use big data for precision marketing, and expand market channels.

Strictly control cash flow, and reduce expenses and costs. By negotiating with employees and adopting methods such as salary adjustments, job rotations, shorter working hours and flexible job assignment to maintain stable employment, enterprises can reduce their daily operating expenses and concentrate funds on key positions such as research and development to improve agricultural technology.

Small businesses and microenterprises should make an effort to understand the government's fiscal, taxation and financial policies intended to support them, and monitor the development of the pandemic situation and related policy guidance. Specific preferential policies include rent reductions or exemptions for small and medium-sized agricultural enterprises, a lightening of their tax burden and deferred payment of taxes, and support for them to start new businesses. To reduce their tax and interest pressure, small and medium-sized agricultural enterprises can apply for tax reductions and interest discounts based on their situation.

Improve the company's crisis response capacity. Through crisis response and crisis management training, improve managers' and operators' awareness of and ability to respond to crises. It is almost impossible for enterprises to develop and survive without any crisis event; therefore, they need to develop mitigation plans. Enterprises should actively communicate with upstream and downstream suppliers, logistics channels and customers, jointly reduce profits and share losses to get through difficulties. At the same time, some powerful agricultural enterprises have seen opportunities for industrial integration during the pandemic. They should

use their asset advantages, technical strength and management capabilities to integrate upstream and downstream industries, improve efficiencies of scale and increase industrial concentration for future prosperity and development.

Capacity of logistics and distribution systems

Strengthen reserves of agricultural materials and products, guarantee the supply of agricultural products, and ensure the continuation of normal agricultural business activities. Maintain good relations with logistics operators; first-class logistics services can more effectively ensure that orders are delivered on time. Strengthen the production and marketing of agricultural products such as grains, vegetables and fruits, and unblock the “Green Channels” for the transportation of agricultural products based on market supply and demand. Exploit their advantages and use their platform channels to actively promote poverty alleviation products to the market. Through contract farming and share dividends, agricultural enterprises can integrate smallholder farmers into the agricultural supply chain, establish a sound mechanism for farmers to share the value-added benefits, and strengthen the financial links between enterprises and farmers, so that farmers can share the benefits of corporate growth and the value-added supply chain.

By changing the conditions such as the temperature and light intensity of greenhouses, agricultural enterprises can adjust the time to market for fresh fruits and vegetables to avoid concentrated harvesting. Agricultural enterprises should make full use of intelligent greenhouses to develop the cultivation of diversified organic agricultural products, use technology to lead the development of the business, and create high-quality, healthy green agricultural products.

Adjust distribution methods to reduce personal contact. Make full use of retail stores in villages and towns as a transit station for the distribution of agricultural materials, and the retail stores in villages and towns can play a role in the distribution of materials. Fixed-point distribution, centralized procurement, community distribution and nearest delivery will also reduce the concentration of staff and personal contact. The cost of vegetables and other agricultural products can be comparable to that of the farmers’ market by scaling up production and through direct distribution. In the future, the supply of agricultural products based on network distribution and community direct supply will become more and more common.

Adjust supply chain management to deal with the increasing difficulty of procurement and distribution. Agricultural enterprises should increase the coordinated management of the supply chain, improve the level of informatization, accelerate the speed of information transmission, establish reasonable expectations and estimates of product inventory, and avoid or reduce the negative impact caused by the sharp price fluctuations of semi-finished products in the supply chain. At the level of agricultural product distribution, plan and cooperate with trusted partners to ensure safe inventory levels and smooth distribution.

E-commerce and agrifood innovations

Use the internet for live broadcasts. Emerging sales models such as live broadcasts in production areas and warehouses can not only overcome issues of consumer trust but also increase consumer stickiness. During the pandemic, people spent more time online for leisure and entertainment, and agricultural enterprises made efforts to advertise their products, use live webcasts to open up the market and form a new structure of integrated online and offline activities.

Deep integration with e-commerce. Agricultural enterprises should explore a new distribution model of “e-commerce platform + base direct supply”, which provides contactless distribution services in a direct supply model, enabling consumers to pick up their purchases at a contactless community pick-up point. This can not only reduce personal contact, to effectively contain the pandemic, and meet the daily needs of the people, but also accelerate the iterative upgrade of the agricultural product supply model. Agricultural enterprises can take advantage of the resources of online sales platforms to make up for their “internet gap” in the short term. They can then gradually cultivate their own online retail team, accumulate internet+ operating experience and promote construction of their own direct sales network.

Promote online information exchange platforms to foster mutual assistance among enterprises. Through the online information exchange platform, establish a stable mutual assistance relationship with the paired unit canteens, communities, supermarkets and agricultural product distribution companies, and carry out direct sales of origin. The online information exchange platform helps companies reduce costs, improve operational efficiency, optimize the speed of obtaining information resources, and seize market opportunities. Analysis of the role of digital construction of enterprises found that in terms of responding to the impact of the pandemic, digital construction has a “threshold effect”. When digital construction reaches a certain level, enterprises can obtain considerable returns; the direct role of digital construction in responding to the impact of the pandemic is limited though. The positive effects are mainly reflected in soft power such as product and service innovation, customer loyalty and employee stability. Digitalization has a significant impact on operational management and sales, and remote working and the expansion of online sales channels have helped reduce the negative impact of the pandemic to a certain extent.

Storage facilities and cold chain as the key

Strict cold chain logistics workflow is crucial. For imported cold chain foods from areas with an active epidemic, handlers and other operators should be instructed to wear masks during the entire process of moving goods, to keep goods away from their faces and to avoid touching their mouth and nose with their hands. Open cold chain food packaging at will to prevent contact with frozen products that may be contaminated, and effectively protect the safety of front-line workers and prevent the risk of infection. Thoroughly disinfect transportation equipment and resolutely prevent the spread of the virus through transportation channels. Before and after use of cold chain transportation, thoroughly disinfect the parts of the vehicles and containers used that may have been in contact with goods. If imported cold chain food or packaging is found positive for COVID-19, the company should quickly initiate an emergency plan, take measures such as cutting off the transmission route and isolating close contacts, and undertake timely and effective treatment.

Integrate and optimize regional industrial, product, network and logistics resources, accelerate the extension of the industrial chain, integrate primary, secondary and tertiary industries, and build a full-process cold chain supply chain. Intensify warehousing and distribution, establish a full-process temperature control, green and safe cold chain logistics service system, improve the capacity of freezing and cold storage facilities for agricultural products, and form a cold chain infrastructure network with an appropriate structure, wide coverage and smooth connections. Upgrading the entire cold chain logistics process will improve the capacity to keep food fresh, guaranteeing the safe transportation of food and reducing product losses during transportation.

Creating employment opportunities through innovation

Companies should make full use of the convenience of online software to promote the transformation of human resource management and form a new management model integrating online and offline processes. Make full use of online education and training resources and software to provide employment and vocational skills training, and improve employees' professional skills and performance level. To improve the efficiency of recruitment, enterprises can use big data analysis to automatically select suitable job applicants according to the job requirements. In the staff training process, they can provide personalized training programmes according to different employees' development needs. In terms of performance evaluation, appraisal methods using big data algorithms will be more comprehensive and objective than traditional performance appraisal methods, leading to greater accuracy and credibility.

Open flexible remote offices, and use video conferencing software. Small and medium-sized agricultural enterprises should implement remote office, online sales, automated production and other measures to mitigate the negative impact of the pandemic through WeChat workgroups, Tencent/Zoom video conferencing and other apps, and explore a new business model of "working from home" to reduce the number of people gathering and risk of infection. They should enhance employees' professional skills and overall performance level through online education and training, promote the transformation of human resource management, and develop a new form of online and offline integration.

Other recommended measures for businesses to adopt include developing flexible human resource plans, adjusting recruitment and interview methods, using online recruitment software, developing online and remote recruitment, promoting employee recruitment in an orderly manner, and attracting migrant workers to return to local employment. Enterprises should introduce the principle of flexibility, attach importance to the personal values and interests of employees, strengthen pastoral care for employees, and adjust the performance evaluation mechanism during the pandemic. They should establish a salary and welfare system and a performance evaluation system that conform to the characteristics of the times and the industry, adopt comprehensive up-to-date evaluation methods, systematically, comprehensively, fairly and objectively evaluate employees' completion of production tasks within a period of work, and help employees demonstrate their initiative and creativity to assist the development of the company.

Develop a new model of "shared employees". "Shared employees" can be seconded among agricultural business entities to optimize the deployment of human resources. This can alleviate the employment difficulties of small and medium-sized agricultural enterprises and effectively increase the income level of employees. Enterprises should make full use of information-sharing platforms, strengthen communication and cooperation, use resources effectively, seek common ground and shelve differences, coordinate and advance together, and jointly respond to the impact of the pandemic.



LESSONS LEARNED AND RECOMMENDATIONS

©IFAD/Susan Beccio

Experiences and lessons learned

Following the COVID-19 impact analysis and the mapping of the policies and coping strategies adopted by the government, enterprises and farmers, some of the lessons learned are summarized as follows.

- When facing a crisis (e.g. the COVID-19 pandemic), the disruptions of the agrifood chain and rural economy are multifaceted (i.e. supply, consumption, finance, employment and trust). Systemic approaches to mitigating the impacts need to be formulated and implemented in parallel with containment measures and regulations. A broad range of prevention and mitigation policies were adopted in parallel (e.g. for production, marketing, finance and social assistance); it is important and valuable to investigate and assess the effectiveness of the individual policies and their combination.
- The capacity of logistics and distribution, including storage and cold chain, is fundamental in coping with a crisis. The most useful mitigation policy regarding the logistics and transportation of agricultural products from farms to markets is the “Green Channel” policy which promotes multisectoral coordination to enable market exchange. “Green Channel” policies effectively cushioned the disruption

of the agrifood chain in the early stage of the pandemic by reducing transport barriers and ensuring the availability and trade of essential food products. The benefits of policies on stakeholders need to be systemically assessed by region, sector and position in the supply chain. The main actors in the industrialized agrifood system of mass production and mass distribution in China, such as market-leading companies, large suppliers and retailers, and franchising community retailers, played an important role in coping with the disruption caused by the crisis.

- Restoring the function of the market (e.g. connectivity, pricing and information) was a priority when coping with the disruptions related to COVID-19 in China; this included timely regulations on speculation that could disrupt information and social trust. By providing particular support to large-scale actors, with which the Ministry of Agriculture and Rural Affairs was directly coordinating, the government avoided food shortages and large price hikes for consumers. Specific interventions targeted key agrifood chain stakeholders, such as market-leading agribusiness firms, chain retailers, e-marketplaces and platforms, given their reach and the scaling potential of interventions, including interest-free loans, and reduced taxes and rental fees. The role of alternative food networks and localized agrifood innovations should not be neglected or played down as simply niche complementary activities; they are important for agricultural transformation towards greater resilience.
- The presence of e-commerce and social media in China's rural economy during the COVID-19 pandemic mitigated the negative effects and facilitated innovation and the transformation of agribusiness. The e-commerce platform enabled commodity aggregation and information searching. Online sales models promoted by e-commerce companies that linked producers directly to consumers created innovative sales channels through videos describing the production process and story of individual vegetable producers. Subsidies and coupons to boost consumption proved effective.
- Community-based adaptations and social networks, such as cooperatives, mutual assistance organizations and social organizations, were the backbone of rural society during the pandemic in China. Decentralized citizen decision-making highlighted the need to raise public awareness and develop cognitive capacity. Social media demonstrated great potential to enhance crisis communication; in China, the pandemic opened up transformative opportunities for social media companies to develop new hybrid businesses in the rural economies.
- The capacity of crisis management must be developed and tested in normal times, so that they are ready for use. Where crisis leads to collective and reflexive learning, the experience of crisis management enhances resilience and unleashes the great potential of innovations that would have never been developed in a normal situation.

- Vulnerable groups must be protected and engaged. When facing a crisis, off-farm employment opportunities are crucial to sustain livelihoods and reduce poverty in the rural economy. The most vulnerable households are those relying on casual remittances and agricultural revenue. Targeted transfers to vulnerable households – allowing them to sustain the quality and quantity of their diets – seem essential to prevent a rise in food insecurity. This would call for a systems approach to integrating crisis management with the national system of poverty monitoring.

Recommendations

To ensure a sustainable food system and rural livelihood with resilience to shocks, the following recommendations are made.

- Strengthen market early-warning and response systems, and especially enhance crisis management.
- Establish and improve agricultural product distribution centres, as well as small, medium-sized and large wholesale markets.
- Invest in storage and logistics facilities to ensure the availability of and access to food, especially under crisis circumstances.
- Optimize the structure of food stocks, and ensure the availability of and trade in food products, reducing transport barriers as much as possible.
- Build on the success of the “Green Channels”, which re-established the transportation of and trade in essential agricultural inputs and outputs but was most effective for products that are not rapidly perishable such as cereals.
- Improve access to high-quality and hygienic slaughtering facilities, as well as storage facilities for producers and collectors. This would help cushion the impact of a future crisis, and allow smallholders to increase direct sales to customers or large retailers.
- Enable the farmer cooperatives of smallholders and SMEs to manage trader risk through marketing adaptability.
- Provide policy, infrastructure and capacity-building for the development of e-commerce.
- In the long term, enhance the strategic planning of food security with a broad and comprehensive food systems approach.
- Invest in sustainable food production capacity, with an emphasis on the main areas of food production and basic cultivated land, and increase investment in technological development in seeds and agricultural machinery.
- Coordinate the regional planning of perishable products and increase the flat value chain with local production and local consumption.

- Job opportunities are crucial for migrant and casual workers. Continue the financial support for enterprises which provide job opportunities for migrant workers, ease the procedure for enrolling new employees, and facilitate access to loans and tax reductions. Local jobs will be crucial during a pandemic, and the emphasis can be on factories targeting poverty alleviation for local female workers and returning labourers from urban areas. Local tourism can be supported with more local promotion and information awareness approaches. Enhance the coherence of employment information to assist migrant workers and provide training for more job opportunities.
- Rural areas proved to be the stabilizer of social development during the pandemic, and one key factor is the stable land policy in China. Even under rapid urbanization, the land policy remains stable to guarantee that farmers maintain the right to operate farmland which provides a basic livelihood when other income sources are not available. This also contributes to household food security, as self-production represents a major food resource. On the other hand, motivated by asset- and technology-intensive agricultural development, flexible land transfer models are encouraged, such as land trusts which bring about economies of scale and specialized land management to smooth revenues for smallholder farmers.
- In the long term, along with modern agricultural development, more off-farm income-generating opportunities will be key to rural livelihoods. The focus should be placed on creating additional and diversified off-farm income-generating opportunities, such as services, tourism, logistics, transport, construction, local entrepreneurship and the digital economy. The expansion of the service industries linked to agriculture, such as post-harvesting, agroprocessing and food services, has the potential to attract investors and generate new employment opportunities that could retain people in rural areas and should be leveraged. Moreover, the application of digital technologies and other innovations to agriculture can help increase agricultural productivity and maintain agriculture's role in supporting growth.
- Targeted measures should be provided for diversified livelihood groups. Food security and nutrition assistance are the key demand for elderly people and children. Targeted transfers to these households seem essential to prevent a rise in food insecurity. COVID-19 also provided an opportunity to advocate for the adoption of a healthy diet by overweight and obese people by reducing the intake of animal protein.
- Awareness of agricultural insurance increased during the crisis, while income insurance is also advocated.

- Social safety nets are needed and should be expanded to protect those who are the most affected and most vulnerable. China has formed a social protection system consisting of social assistance, social insurance and social welfare. The dual structure is a specific feature between rural and urban social protection systems. Social assistance is the basic institutional arrangement and covers a minimum living allowance, exceptional assistance, and specific and temporary assistance in rural areas. Social insurance includes basic pension insurance and basic medical insurance for rural residents. Social welfare mainly focuses on elderly people, children, and persons with disabilities; it covers housing subsidies for the renovation of dilapidated houses in rural areas. A large investment was made in the rural social protection system as part of a targeted poverty alleviation effort, but COVID-19 revealed that it requires further input for rural medical care, education and pensions to narrow the gap with urban areas and to expand coverage to migrant workers, who have limited access to public services and social protection because of their household registration.

- A rights-based, inclusive social protection system needs to be developed and expanded to include households with a relatively low income, to strengthen their resilience to shocks and risks.

- A mechanism of stable and sustainable information dissemination and public health prevention is urgently needed.

REFERENCES

Blake, P. and Wadhwa, D. 2020. 2020 Year in Review: The impact of COVID-19 in 12 charts. World Bank blog, 14 December. <https://blogs.worldbank.org/voices/2020-year-review-impact-covid-19-12-charts>.

Cai, I.P. et al. 2020. *Research report on the impact of COVID-19 epidemic on the vegetable industry*. Beijing: CAAS (in Chinese).

Central Leading Group for Response to the Epidemic. 2020. *Notice on Further Doing a Good Job in Protecting People in Difficulties during Epidemic Prevention and Control*. Beijing: Central Leading Group for Response to the Epidemic.

Chen, K., Yumei, Z., Yue, Z., Shenggen, F. and Wei S. 2020. How China can address threats to food and nutrition security from the coronavirus outbreak. IFPRI blog, 12 February. <https://www.ifpri.org/blog/how-china-can-address-threats-food-and-nutrition-security-coronavirus-outbreak>.

Wang Y D, China 2020 – Rapid assessment of the impact of COVID-19 on employment, International Labour Organization, Policy Brief, July 2020

Chen, Z., Yue, Z., Yumei, Z. and Shenggen, F. 2020. *The impact of the Covid-19 on global food security and countermeasures*.

Zhang Y M et al. Impact of COVID-19 on China's macroeconomy and agri-food system – an economy-wide multiplier model analysis, *China Agricultural Economic Review* Vol. 12 No. 3, 2020, pp. 387-407

Cheng, G.Q. et al. 2020. Famous experts and scholars talk about the impact of COVID-19 on world food security and China's agriculture. *World Agriculture*.

Chinese Academy of Agricultural Sciences. 2020a. *Impact of COVID-19 on agricultural trade and recommendations*. Report No. 30. Beijing: CAAS.

Chinese Academy of Agricultural Sciences. 2020b. *Impact of COVID-19 on livestock*. Report No. 3. Beijing: CAAS.

FAO. 1996. *Report of the World Food Summit, 13-17 November 1996*. Rome: Food and Agriculture Organization of the United Nations, <http://www.fao.org/3/w3548e/w3548e00.htm>.

Fengying, N. et al. 2020. The impact of new crown pneumonia on the production and life of farmers in poor areas. Beijing: CAAS.

General Office of the Ministry of Agriculture and Rural Affairs, General Office of the National Development and Reform Commission, and General Office of the Ministry of Transport. 2020. *Emergency Notice on Resolving Current Practical Difficulties and Accelerating the Resumption of Work and Production in the Animal Husbandry Industry*. Beijing: Ministry of Agriculture and Rural Affairs.

General Office of the Ministry of Commerce. 2020. *Notice on Doing a Good Job in Guaranteeing the Supply of Living Materials in Key Cities*. Beijing: Ministry of Commerce.

The State Council Leading Group Office of Poverty Alleviation and Development. 2020. (in Chinese). http://www.cpad.gov.cn/art/2020/4/30/art_106_120964.html.

Harris, J. 2020. Diets in a time of coronavirus: Don't let vegetables fall off the plate. IFPRI blog, 13 April. <https://www.ifpri.org/blog/diets-time-coronavirus-dont-let-vegetables-fall-plate>.

Hubei Province Agriculture and Rural Affairs Department. 2020. The impact of COVID-19 on Hubei farmers' cooperative and its countermeasures. *China Farmers' Cooperatives*: 24-25.

Jiang, H. 2020. *Assessment of the impact of COVID-19 on Agricultural Value Chains and rural households in selected provinces and counties in China*. Beijing: Agricultural Economics and Development Institute, CAAS.

Leading Group for Poverty Alleviation and Development of the State Council. 2020. *Notice on Doing a Good Job in Poverty Alleviation during the Period of Prevention and Control of the New Coronary Pneumonia Epidemic*. Beijing: State Council.

Li, C.X. et al. 2020. The Main Influence and Countermeasures of Novel Coronavirus Pneumonia on Effective Supply of Agricultural Products. *South China Rural Area*: 16-22.

Li, L. et al. 2020. The Influence and Formation Mechanism of Covid-19 Epidemic on Residents' Consumption Behavior. *Consumer Economics* 36(3): 19-26.

Lin, B.X. et al. 2020. Impact of the COVID-19 pandemic on agricultural exports. *Journal of Integrative Agriculture* 19(12): 2937-2945.

Lin, T. 2020. *The epidemic has a big short-term impact on the retail market, and the long-term trend of consumption has not changed*. Beijing: National Bureau of Statistics. http://www.stats.gov.cn/tjsj/sjjd/202003/t20200316_1732420.html.

Martin, V. 2020. The impact of Covid-19 on the agriculture sector in China. *Think China*, 2 April. <https://www.thinkchina.sg/impact-COVID-19-agriculture-sector-china>.

Ministry of Agriculture and Rural Affairs. 2020a. *Current Spring Plowing Production Work Guidelines*. Beijing: Ministry of Agriculture and Rural Affairs.

Ministry of Agriculture and Rural Affairs. 2020b. *Notice on Coordinating the Prevention and Control of the Epidemic and the Construction of High-standard Farmland*. Beijing: Ministry of Agriculture and Rural Affairs.

National Bureau of Statistics. 2020a. *Decline of Major Economic Indicators Significantly Narrowed Down in March*. Beijing: National Bureau of Statistics.

National Bureau of Statistics. 2020b. *The Economic Growth in the First Three Quarters Turned from Negative to Positive, and the GDP in the Third Quarter Increased by 4.9%*. Beijing: National Bureau of Statistics.

Poverty Alleviation Office of the State Council and Central Cyberspace Administration of China. 2020. *Notice on the implementation of consumer poverty alleviation actions*. Beijing: State Council and Central Cyberspace Administration.

Poverty Alleviation Office of the State Council and Ministry of Finance. 2020. *Notice on Actively Responding to the Impact of the Epidemic and Strengthening the Management of Special Financial Poverty Alleviation Fund Projects to Ensure Complete Poverty Alleviation Targets and Tasks*. Beijing: State Council and Ministry of Finance.

Strategic Research Center of Chinese Academy of Agricultural Sciences. 2020a. *The impact of the Covid-19 on farmers' income and countermeasures*. Beijing: CAAS.

Strategic Research Center of Chinese Academy of Agricultural Sciences. 2020b. *Overcome the impact of the Covid-19 and promote farmers. Countermeasures to increase the income of migrant workers*. Beijing: CAAS.

Strategic Research Center of Chinese Academy of Agricultural Sciences. 2020c. *The impact of the Covid-19 on China's agriculture-food system, labor employment and the residents' income*. Beijing: CAAS.

Strategic Research Center of Chinese Academy of Agricultural Sciences. 2020d. *Food Supply System and Resident Consumption Structure*. Beijing: CAAS.

Strategic Research Center of Chinese Academy of Agricultural Sciences. 2020e. The impact of the Covid-19 on agricultural and rural production and life as well as the countermeasures. Beijing: Institute of Agricultural Planning Science, CAAS.

Strategic Research Center of Chinese Academy of Agricultural Sciences. 2020f. The impact of the Covid-19 on the optimization of China's food supply system and residents' food consumption structure. Beijing: Institute of Agricultural Planning Science, CAAS.

Strategic Research Center of Chinese Academy of Agricultural Sciences. 2020g. The impact of the Covid-19 on agriculture and rural areas. Beijing: Institute of Agricultural Planning Science, CAAS.

Strategic Research Center of Chinese Academy of Agricultural Sciences. 2020h. The impact of the Covid-19 on production and life in poor areas. Beijing: Institute of Agricultural Planning Science, CAAS.

Tengxun News. 2020. International Livestock Network. <https://wxn.qq.com/cmsid/20200430A050EV00>.

UNDP. 2020a. *Assessment Report on Impact of COVID-19 Pandemic on Chinese Enterprises*. New York: United Nations Development Programme.

UNDP. 2020b. *Socio-economic Impact Assessment of the COVID-19 Pandemic in Poverty Areas – analysis based on 1183 households surveyed in five poverty counties in China*. New York: United Nations Development Programme.

UNDP and CICETE. forthcoming. *Socio-economic Impact Assessment of the COVID-19 Pandemic in Poverty Areas*. New York: United Nations Development Programme; and Beijing: China International Center for Economic and Technical Exchange.

Wei, H.K. and Lu, Q. 2020. *Impact of the Covid-19 on Agriculture, Rural Areas and Countermeasures*.

Wei, H.K. et al. 2020. Impact of COVID-19 on "Agriculture, Countryside and Farmers" and Countermeasures. *Economic Review Journal* 36(45): 2 (in Chinese).

World Bank. 2020. *East Asia and Pacific in the time of Covid-19*. Washington, D.C.: World Bank Group.

Xiaobo, Z. 2020. *Chinese livestock farms struggle under COVID-19 restrictions*. Washington, D.C.: International Food Policy Research Institute.

Yang, J.D. et al. 2020. Impact, Influence and Countermeasures of Epidemic Situation on Agricultural Development in China. *Farmers Daily*. http://www.cssn.cn/xnc/202004/t20200420_5116023.shtml.

Ye, X. et al. 2020. Evaluation of the impact of the Covid-19 on agricultural and rural development in 2020 and countermeasures. https://mp.weixin.qq.com/s/3BWd2wyW4cGsG8m_sb7Gcg.

Yu, X., Liu, C., Wang, H. and Feil, J.H. 2020. The impact of COVID-19 on food prices in China: Evidence of four major food products from Beijing, Shandong and Hubei Provinces. *China Agricultural Economic Review* 12: 445-458.

Yuying, Y. et al. *The impact of the Covid-19 on the employment of rural households in rural area-based on micro survey data in 20 counties.*

Zhang, D. 2020. The impact of COVID-19 on SMEs and Counter Measures. *TSINGHUA Financial Review* 3: 60-64.

Zhang, X.C. 2020. Effect of Novel Coronavirus Pneumonia Epidemic Situation on Agricultural Product Supply Chain and Its Response Mechanism. *Agricultural Economics and Management* 4: 45-51 (in Chinese).

Zhou et al. 2020. *Measurement and Countermeasures of Supply and Demand Gap of Livestock and Poultry Meat Products in the Future Caused by COVID-19 Epidemic.* Beijing: CAAS (in Chinese).



International Fund for Agricultural Development
Via Paolo di Dono, 44 - 00142 Rome, Italy
Tel: +39 06 54591 - Fax: +39 06 5043463
Email: ifad@ifad.org
www.ifad.org

 [facebook.com/ifad](https://www.facebook.com/ifad)

 [instagram.com/ifadnews](https://www.instagram.com/ifadnews)

 [linkedin.com/company/ifad](https://www.linkedin.com/company/ifad)

 twitter.com/ifad

 [youtube.com/user/ifadTV](https://www.youtube.com/user/ifadTV)

ISBN 978-92-9266-155-7

