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Citation

ZHANG, Forrest Q., & HU, Zhanping. (2021). Rural China under the COVID-19 pandemic: Differentiated impacts, rural–urban inequality and agro-industrialization. *Journal of Agrarian Change*, 21(3), 591-603. Available at: https://ink.library.smu.edu.sg/sooss_research/3411

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Rural China under the COVID-19 pandemic: Differentiated impacts, rural–urban inequality and agro-industrialization

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Funding information

National Social Science Fund of China, Grant/Award Number: 20CSH020

Abstract

We use field data collected in a village in northern China to examine the impacts of the COVID-19 pandemic on rural economy and livelihoods. The lockdown effectively protected the village from the pandemic, resulting in zero infection. The economic impacts were mostly negative but differentiated across economic sectors and livelihood strategies; some gained from the business opportunities arising from the pandemic. Wage loss for migrant workers was the most common negative impact but lasted less than 2 months. Overall, rural China has escaped the worst impacts of the pandemic found in other developing countries. We argue that the structure of inequalities in today's China, now primarily based on market differentiations, has become far more complex than the simplistic rural–urban dichotomy based on the household registration (hukou) status can possibly explain. Rather than exacerbating the hukou-based rural–urban inequality, the true impacts of the pandemic on rural China are more likely to result from the reforms of the agri-food system. The suspected link between the new pathogen and the food system has created a misinformed urgency for the government to accelerate the industrialization of the food system, which we think can backfire and increase the likelihood of the next outbreak.

KEYWORDS

COVID-19 pandemic, food system, hukou, livelihood diversification, rural differentiation

1 | INTRODUCTION

Despite having the first large-scale breakout of the disease, China has managed to escape the worst impacts wrought by the COVID-19 pandemic. As of 8 September 2020, when the central government held a national ceremony in Beijing to celebrate the success in containing the pandemic, the total number of confirmed cases was 90,151, of which the fatality rate was 5.23%, resulting in a national tally of 4740. Three quarters of all infected cases and 95.2% of all fatalities concentrated within Hubei Province, especially the city of Wuhan, the epicentre of the pandemic. While China was the first country to implement nation-wide lockdown measures, it was also among the first to lift such measures and reopen the economy. On 23 February 2020, the central government had already started to urge local authorities to re-open the economy. Travel out of Wuhan, where the most strict lockdown had been in place for 76 days, was lifted on 8 April. By the first week of May, during the 5-day Labour Day holidays, most travel restrictions within the country had been lifted, and over 100 million domestic tourists and holiday makers travelled across the country. In the second quarter, the Chinese economy registered a 3.2% gross domestic product (GDP) growth rate, the only positive growth record among the G20 countries (National Bureau of Statistics [NBS], 2020a). For China as a whole, the negative impact of the pandemic is spatially concentrated in one province, temporally of short duration (in terms of the most restrictive lockdown measures), and overall moderate in its severity.

The fast, decisive and coordinated responses by the central governments are the key to the country's success in containing the spread of the disease and mitigating the impact.¹ When China was the first and only country implementing lockdowns, Western media, while recognizing the effectiveness of these measures, castigated these as draconian and brutal; some commentators also suggested—or even hoped—that the pandemic would become 'China's Chernobyl' that would destabilize the regime (Tharoor, 2020; Topaloff, 2020). The Chinese government's responses may at times have been overly rigid and excessive, but now 10 months after the initial outbreak, when major European countries had to re-instate lockdown measures to combat the second or third wave of the pandemic and the daily increase of infections surpasses 100,000 in the United States, but social and economic life in China has nearly fully recovered, it is time to give credit where it's due.

The impacts of any large-scale epidemic are always mediated by the structure of inequalities in a society and can thus reproduce or exacerbate existing inequalities. In this study, we focus on the impacts of the pandemic on rural China. The 551.6 million rural population² in China is often treated in the social science literature as a homogeneous group and is studied as the 'Other China' that is economically poorer, socially more vulnerable, and physically less healthy than the urban population (Rozelle & Hell, 2020). From that perspective, it is then expected that the rural population would be more severely affected by both the pandemic and the social and economic disruptions that resulted from it. Several early studies have made this argument and found supporting evidence (Che et al., 2020; Qian & Fan, 2020; Rozelle et al., 2020).

We dispute that conclusion. Instead, we argue that, in the larger backdrop of the overall moderate negative impacts of the pandemic in the country, in rural areas in China, where economic activities were less hindered by social distancing and less dependent on the constant movement of commodities, the impacts have been even smaller. Studies elsewhere have found that the pandemic delivered its worst blow to the poor in forms of large-scale fatality and higher fatality rate, widespread hunger or food shortage, forced eviction from places of work and massive and prolonged losses of jobs and incomes (Clapp & Moseley, 2020; Mezzadri, 2020; Oxfam, 2020; Ranscombe, 2020). All these have been avoided in rural China.³ For example, Chinese agriculture managed to achieve a slight increase in the summer grain harvest of 2020—0.9% from last year—reaching another historical

¹Briefly, the strict lockdown implemented in Wuhan prevented a nation-wide breakout of the pandemic; medical personnel and facilities from across the country were then deployed to tackle the emergency in Wuhan, and a full-scale mobilization of the entire society was launched across the nation to contain the spread of the disease.

²This number refers to the 'resident population'—those who spend at least half of the past year living in rural areas. The rural population based on household registration (*hukou*), in 2019, was 778.7 million. The difference between the two (227.1 million) is the migrant population—people with rural *hukou* but mainly live in urban areas as migrants.

³In fact, we suspect that in China the urban poor fared worse in terms of fatalities, food shortages and loss of shelter, jobs and income.

high.⁴ By the end of the second quarter, according to the central government's statistics, 178 million rural migrants had returned to work in cities across the country, a 97.3% rate of recovery compared to last year's figure (NBS, 2020a).

More importantly, we think a different analytical approach is now needed for studying rural–urban inequalities in China. The simplistic, dualistic division of rural–urban is too blunt and inaccurate an analytical device for studying inequalities in contemporary China (Zhang, 2011, 2015). The development of the market economy in China in the past four decades has brought both rural and urban, agriculture and industry into integrated circuits of capital, labour and commodities. The structure of inequalities in today's China is no longer based on the dichotomous rural–urban division created by the administrative system of household registration (the *hukou* system) but based on the unequal powers, resources and rewards across different market positions. The spatial separation, economic division of labour and differences in social service provision that exist between urban and rural areas, which are not reducible to *hukou* differences, all contribute to rural–urban inequalities through placing people in unequal market positions. If some in the rural population are indeed more vulnerable, their vulnerabilities are not simply the result of having rural *hukou* but rather because of the disadvantageous and precarious positions they occupy in the circuits of capital, labour and commodities.

From this perspective, China's rural population should be treated as a differentiated group and analysed in a disaggregated way. With regard to the pandemic, while many in rural China have indeed suffered economic losses, the experiences are highly differentiated, varying across economic sectors and occupational positions.⁵ It is erroneous to say that the rural population bore more of the blunt than the urban population.⁶ Instead, we need to ask who among the rural population suffered more and who fared better.

Furthermore, while studies in other countries have keenly noticed the pandemic's connection with and impacts on the food system (Akram-Lodhi, 2020; Clapp & Moseley, 2020; Schmidhuber, 2020), studies in China have so far neglected this aspect. Besides causing disruptions to food access and food production and even creating food crises, in China's case, where the origin of the new pathogen has been linked to the food system, the pandemic can trigger policy responses that aim at transforming the food system and can have long-term impacts on the rural economy and livelihoods.

In this paper, we draw on primary data collected from one village in North China to provide a granular look at the impacts of the pandemic on the village level. In Section 2, we document how the pandemic was experienced and responded to in differentiated and concrete ways by people occupying different positions in the socio-economic structure. Section 3 discusses the impacts of the pandemic on rural–urban inequality in China and critiques the widely used, simplistic rural–urban dichotomy based on *hukou* status as an ineffective tool for understanding inequality in China today. The last section discusses the potential impacts of the pandemic and the ensuing policy responses on accelerating the agro-industrialization in China and the implications to the agri-food system.

2 | A RURAL VILLAGE UNDER THE PANDEMIC: RESPONSES AND IMPACTS

Our research site, Norwind village, is a medium-scale and moderately wealthy village, located in west Shandong Province. The village is typical of rural communities on the North China Plain in every sense: It is densely populated (1292 residents in 423 households), the scale of family farms is minuscule (0.3 ha per household), the cropping pattern consists of two harvests of summer maize and winter wheat and it is well connected into the dense transportation network that crisscrosses the North China Plain. Norwind village had been the second author's research site before the

⁴Other agricultural sectors, especially poultry and pork, however, were hit by the pandemic far worse, as will be discussed in more detail later.

⁵For a similar finding in India, see Ceballos et al. (2020).

⁶After all, 82% of all fatality (3869 cases) in the country occurred in one city, Wuhan, and most of the deceased were urban residents.

pandemic started. He made a week-long field trip in June 2020 to study the impacts of the pandemic and the community's responses and followed that with a series of phone interviews in the next 2 months as the situation evolved.

After the pandemic broke out in Wuhan city in December 2019 and the lockdown implemented on 23 January, similar lockdown and quarantine measures were adopted by local governments across the country. In the prefecture and the county in which Norwind is located, the lockdown order was announced on 25 January: Citizens were ordered to stay at home, social gatherings and visitations within villages were discouraged, all commercial activities suspended, and movement of goods tightly controlled and inspected. Vehicles distributing essential goods such as foods, livestock feeds and emergency supplies were allowed to enter villages, but all other outside vehicles were prohibited from entering. At Norwind, immediately upon receiving the lockdown order, villagers blocked all road entrances to the village and set up checkpoints, each guarded by two volunteers.⁷

The situation, however, soon turned around. In early February, local governments first allowed important manufacturing firms to re-open, and then, in mid-February, commercial shops to gradually re-open. On 20 February, the prefecture government re-opened all the highway toll gates that had been closed since 30 January, allowing outside vehicles to enter local areas. Subjected to the mandatory temperature taking and upon approval, villagers could leave the village to conduct essential activities. Around 20 March, all mobility restrictions were lifted, and residents could finally move freely; all socio-economic activities returned to normal. Throughout the pandemic, Norwind did not have a single case of infection. This experience is typical of rural North China. The entire Shandong Province, population 100 million, had a total of 846 confirmed cases and 7 deaths, almost exclusively in cities. The low-to-zero infection rate in rural areas is also confirmed in a survey of a nationally representative sample of rural households conducted in February (Rozelle et al., 2020).

For rural China, the fortuitous timing of the breakout of the pandemic—a factor idiosyncratic to China—helped to cushion the blow of the pandemic. The Chinese New Year (CNY) is a week-long, annual national holiday period, when most of the non-essential economic activities would grind to a halt and the hundreds of millions of migrants would return to their home villages or cities for family reunion and typically take leave from their work for 7–10 days. In 2020, the holidays fell between 24 and 30 January. By the time when the lockdown was implemented in late January, most people had already travelled back home. Families had also stocked up on foods and essential daily supplies, both for the festival celebrations and to prepare for market closure during the holidays. In other words, even in normal times without the pandemic, the country—especially rural areas—would still enter into a week-long, voluntary ‘economic shut-down’ during the CNY holidays. The coincidence of the lockdown with the CNY holidays reduced the economic impact of the lockdown and increased people's preparedness.

None of our interviewees reported experiencing serious food shortage during the 3-week lockdown period. The poorest families and the elderly living alone received food donations and delivery from the village committee and volunteers. The flour mill in the town, for example, donated 100 sacks of wheat flour for those in need. Meat price had indeed risen considerably during the lockdown and some villagers reported cutting down pork consumption. However, we disagree with Rozelle et al. (2020) that the replacement of some of the meat in the diet with other foods such as cereals and vegetables for a short period of time would lead to declining nutritional intake, let alone long-term adverse cognitive impact for young children.⁸ At this time point, such assertions are nothing more than speculation.

Despite the brevity of the lockdown period in Norwind, it still caused disruptions to the local economy. The impacts on people's livelihoods, however, varied across employment activities and market positions.

⁷As we will see later, these seemingly strict quarantine measures, like most things in rural villages, where everyone is connected to each other by a myriad of social ties, were negotiable. When there were justifiable needs, some villagers not only were allowed to move around within the village, but also cross the quarantine lines into other villages to make deliveries or purchases.

⁸Their survey also confirmed that fruit, vegetables and grains were all available during the lockdown. Their survey did not directly measure nutritional intake.

TABLE 1 Class differentiation among rural households in Norwind village

	No. of households	Percentage (%)
I. Family farming		24
I-a. Traditional smallholding agriculture	41	10
I-b. Specialized commercial farming	52	14
II. Wage employment		54
II-a. Local non-farm employment	100	26
II-b. Migratory employment	94	25
II-c. Formal public-sector employment	10	3
III. Self-employment and small business	85	22
Total	382	100

Note: Among the total of 423 households, 41 are not in gainful employment at the time of the study—the elderly, disabled or in illness.

Typical of rural villages in the more developed parts of China, Norwind has a diversified local economy, with a significant presence of rural industries.⁹ Locally, within both the farm and non-farm sectors, there are also a diverse set of organizational forms of production, including labour-hiring enterprises (and the wage workers they employ), family-based petty commodity production, contract and out-sourcing arrangements and cooperatives. As a result, Norwind's population is differentiated across a myriad of class positions, formed on the basis of the combination of market positions in labour, land, capital and product markets.¹⁰ For this analysis, we divide the village population into six class positions as summarized in Table 1. Interestingly, while there is a high level of diversification within Norwind village across households, within the households, however, livelihood diversification is limited; instead, most families specialize in one type of economic activity—a pattern we call 'village diversification based on household specialization'.

Among agricultural producers, the traditional smallholding family farmers, which has become a small minority at Norwind—only 10% of all households—were the least affected by the pandemic. The lockdown happened during the leisure season for wheat farming, as spring ploughing, fertilizing and irrigation only needed to begin in February. The closure of agricultural supply stores initially created a shortage of fertilizers for some growers, but local governments soon allowed designated retail outlets to re-open. The price increase of fertilizer by about RMB 0.2 *yuan* per kilogram was insignificant for these small-scale growers. Norwind's wheat harvest in the summer was on par with previous years, showing no damage from the pandemic.

In contrast, the specialized commercial farmers suffered far greater losses. There are 52 households in this category, 14% of the village, producing a variety of animal and plant products. Poultry farmers, who were the most reliant on industrial supplies and most 'efficient' by the industrial standard, were the worst hit by the lockdown. Before the pandemic, broiler chicken producers in Norwind operated a just-in-time supply system. Most of them partnered with a supplier-processor company in the neighbouring county—a meat supplier for fast food chains including KFC and McDonald's. They received the chicken hatchlings and feeds from the company and fed the chicken for around 35 days before delivering them back to the company. To prevent spoilage, they received the delivery of the industrially manufactured chicken feeds on a daily basis from the company.

⁹A legacy of the successful rural industrialization, this diversification of the rural economy may be unique to China. In other developing countries, although the livelihoods of rural families can be highly diversified through migration and non-farm wage jobs, the rural economy typically remains predominantly agricultural (Oya & Pontara, 2015). In the less developed regions of China, the Southwest for example, the rural economy is also far less diversified (Donaldson, 2011).

¹⁰See Zhang (2015) for an illustration of using this perspective to analyse the class differentiation among agricultural producers.

When the road closure shut down the supply chain, some farmers immediately started to cull their flocks as their chicken were starving to death. Some tried to find alternative feeds for their chicken and stay in production, intending to weather through the storm. But even after transportation was re-opened, problems continued, as the company faced cancellation of orders from fast food chains and the market price for chicken sharply declined. Most chicken farmers in Norwind had to cull their chickens, some killing the entire flock. The smallest farmers operating just one chicken house had 30,000 to 40,000 birds in each batch and lost at least 20,000 *yuan* during the lockdown.

These losses, however, were not an irrecoverable blow to the farmers. The chicken and pork markets in China have been highly cyclical; losing money for two or three consecutive years is normal, and the loss can be recouped from a single year's profits when the market turns around. Our informants thought that the loss caused by the pandemic was just a blip in the long-term trend of market fluctuations.

Pig farmers weathered this storm far better than the poultry farmers, thanks to their longer production cycle and greater storage of feeds. Before the pandemic, one large-scale pig farmer in Norwind had been mixing the concentrated feeds bought from suppliers with soybean and corn to feed his herd. During the lockdown, he continued to receive delivery of the concentrated feeds from his supplier; the only difference was that he now had to drive his truck to the road-side drop-off point 5 km away from the village to make collection. He expanded the scale of his feed-mixing operation and became the feed supplier for the other 15 smaller pig farmers in the village.

The vegetable and fruit producers in Norwind were equally integrated into the national market. Most sold their produce to wholesalers at a national-level vegetable and fruit trading centre in the neighbouring county just 30 km away, who then shipped to Beijing and the Northeast. The vegetable and fruit farmers, however, better managed to find temporary local solutions during the market shutdown. Two characteristics of their market relations contributed to this outcome. First, fruit and vegetable production were far less reliant on industrial supplies; farmers were therefore able to continue the production during the lockdown. Second, unlike the broiler chickens destined for fast food restaurants, which the locals still shunned, vegetables and fruits faced a surge in local demand during the lockdown when supplies from outside were blocked. After the lockdown started, vegetable farmers immediately used WeChat—the most widely used social media platform in China—to reach out to villagers and take orders. The village head also helped to coordinate the effort by taking in orders from villagers and then relaying to producers in neighbouring villages, who would make daily deliveries to a village entrance in motorized tricycles. Soon, the vegetable and fruit supply chain had been reconfigured to connect local producers to local consumers. One enterprising vegetable producer in Norwind built a distribution network using WeChat with 300 customers in the village. She sold them not only apples, long beans and cucumbers from her own orchard and greenhouses but also other varieties that she sourced from other local producers. In a month's time, she sold 7500 kg of apples, 750 kg of mushrooms, 1000 kg of cherry tomatoes and several hundred kilograms of cucumbers.

About half of all village households (204 in total) relied on wage work as their main source of income. Of these, half were employed locally in manufacturing factories and commercial shops in the town centre, commuting daily. Their return to work after the CNY holidays experienced almost no delay. Ten days into the lockdown, upon obtaining approval from the town government, they were already allowed to travel to the town centre just a few kilometres away from the village. By our count, by the beginning of February, 12 manufacturing firms in the town had already resumed operation. The other half of wage workers, who had been migrants in big cities, faced longer delay in return to work. Most were only able to return in mid-February after a 3-week hiatus, when inter-city travel was re-opened. Even after returning, some faced furlough or wage cut due to the decline in demand. According to the village head, about a dozen migrant workers had also chosen to stay home this year, searching for local jobs. Overall, by mid-March, all wage workers in Norwind, both local and migrant, had returned to work.

One fifth of the households (85) in Norwind were in self-employment or ran small businesses. A commonly taken path to business ownership in Norwind was long-haul trucking, made possible by the village's advantageous location. Ten percent of the village (40 households) were operating long-haul trucking businesses. The ten largest operators each had a fleet of 10 or more semi-trailer trucks, while the smallest owned just one. They all hired two

professional drivers for each truck, most of whom were migrants from the Northeast. For these operators, the pandemic came as a blessing in disguise. This year, they had to wait longer than usual to resume their business after the CNY holidays, as the highway system was closed during the lockdown. However, on 17 February, facing the urgent need of distributing foods, fuels, and medical supplies across the country, the national government ordered local authorities to open the highways and exempt all highway tolls in order to spur the resumption of highway transportation. Highway tolls constituted a third of the operating cost of long-haul trucking; this exemption, coupled with the surging demand after the lockdown, gave a big boost to the long-haul trucking business. In the 80 days till 6 May when the highway toll exemption was rescinded, truck owners in Norwind increased their profits by more than a third, more than making up for the two lost weeks in February. Many fulfilled orders for transporting construction materials and medical supplies to Wuhan.

Other local businesses, such as those selling construction materials, incurred temporary losses, but generally returned to normalcy by the end of March. The three families that operated restaurants suffered the greatest loss; one owner estimated that the loss amounted to a quarter of his annual revenue.

3 | STRUCTURAL INEQUALITIES, DIFFERENTIATED IMPACTS AND RURAL VULNERABILITY

Epidemics reflect and even exacerbate the existing structure of inequalities in a society. It has already been widely documented in studies of the COVID-19 pandemic that the impact was highly unevenly felt across the spectrum of socioeconomic differentiation (Klassen & Murphy, 2020; Leach et al., 2021): The more affluent groups were able to continue their work from home and better cope with the lockdown and social distancing measures; they were less vulnerable to the disease due to superior underlying health conditions; and their greater economic resources better protect them from the social and economic disruptions that range from loss of jobs to housing eviction and food shortages.

China is no exception in this regard. However, the structure of inequalities and vulnerabilities in today's China has become far more complex than a simplistic rural–urban dichotomy can possibly explain, let alone one that is based on the *hukou* status. How the unequal vulnerabilities to and impacts of the pandemic are mediated by this complex structure requires a more careful scrutiny.

Some earlier studies of the pandemic in China have fallen into the trap of using the outdated and simplistic model of a dichotomous rural–urban division based on *hukou* status to explain the complex structure of inequalities and impacts of the pandemic. In the past, all resident citizens in China were registered under either an urban or rural *hukou*, which then granted access to two different endowment packages. The *hukou* system has gone through gradual but significant reforms in the past two decades. In fact, in 2016, the central government has terminated the use of rural and urban *hukou* as two separate categories and unified all *hukou* simply as residential registration. While the differences in entitlement between rural and urban residents still remain, these *hukou*-based entitlements are now far less important in determining people's life chances than their positions in labour, land and capital markets.

Che et al. (2020) conducted a survey in late February, when most localities were only beginning to ease their lockdown measures, of migrant workers from both rural and urban origins, who returned home during the pandemic. They found that rural migrant workers, who are older and have significantly lower education, lower occupation skill and lower family income than urban migrant workers, once returned to their homes, experienced longer duration of delay before work resumption. They also estimated that 'job losses of migrants would be ... likely in the range of 40–70 million', even though the national statistics they quoted already showed a decline of rural migrant unemployment from the peak of 51 million in February to 23 million in May (p. 452).

Based on these findings, they, however, erroneously argue that 'the rural-*hukou* population have borne more of the brunt of the outbreak (p. 458)' and that 'the pandemic has created a new layer of inequality along the *hukou* line

(p. 459)'. This conclusion is flawed in several aspects. First, the authors neglected the internal economic differentiation that existed among rural residents, as documented both here and in other studies of rural China (Zhang, 2015) and erroneously equated rural migrant workers with all rural *hukou* holders.

Second, even for rural migrant workers, who typically adopt a livelihood diversification strategy through pluriactivity across both the rural–urban and agricultural–industrial divides, the temporary loss of wage work, albeit certainly an economic blow, is not the full story. The very fact that many of them returned home before the CNY and were subsequently stranded under the lockdown means that their families, through a gender or generational division of labour, remained active in agricultural production in the countryside. Such agricultural production, based on land rights granted as an entitlement, can provide rural *hukou* holders a source of income to rely on when facing disruptions such as the pandemic.

Third, the authors' erroneous conclusion was based on a fundamental misunderstanding of both the *hukou* system and China's welfare system. In arguing that 'China's social safety net under its rural–urban system is designed mainly to protect the urban-*hukou* population (p. 458)', they neglected a key feature in China's welfare system and the *hukou* system—the land entitlement as the pillar of the rural social safety net (Andreas & Zhan, 2016). Instead of receiving urban unemployment benefits, which migrant workers are also entitled to,¹¹ in the original design of the *hukou* system, land entitlement, for both housing and farming, was used as the instrument for providing a safety net to rural *hukou* holders (He, 2010). This *hukou*-based land entitlement makes rural migrant workers in China a semi-proletarianized labour force, who have the option of retreating to petty commodity production or subsistence farming when their precarious labour commodification is disrupted, as had happened during the 2008–2009 global financial crisis and was happening again this time (Chan, 2010). For many rural families, farming on the minuscule scale of their allocated land is not sufficient to sustain their social reproduction, and that is why so many became migrant workers; but it can provide a temporary relief to job loss and can even provide a base for launching a commercial farming operation when aided by the capitalization from accumulated wage incomes. In comparison, the urban *hukou* holders employed in the informal sectors and marginalized in the social safety net face a more dire situation when they lose their equally precarious employment—they have nothing else to fall back on.

In sum, while the semi-proletarianization is a key feature in making China's rural migrant labour 'cheap', as their social reproduction costs are shouldered at least partly by the rural land entitlement, it also helps to forestall the full commodification of their social reproduction and provide a potential shelter from market-produced vulnerabilities (Zhan & Scully, 2018). In fact, instead of excluding rural migrants from welfare programmes, the more important function of the *hukou* system now is to exclude urban capital from rural land rights. Recent *hukou* reforms, therefore, have tried to weaken the *hukou*-based rural land entitlement to facilitate land dispossession (Andreas et al., 2020; Andreas & Zhan, 2016).

Finally, these authors also erred in using a snapshot at an earlier stage of the pandemic to make extrapolations about a rapidly evolving process. They argued, for example, that the decline in world demand for Chinese products had led to massive job losses for migrant workers and thus treated the delay in migrants' return to jobs as 'unemployment' and echoed the dire prediction of tens of millions of unemployed people by the end of 2020 (Cui, 2020). These predictions have soon been debunked. By the end of June 2020, China's monthly export had already increased by 4.3% on a year-to-year basis. Being the first major economy to reopen, China soon became the largest supplier of medical, quarantine and epidemic-prevention supplies to the entire global market (NBS, 2020a). This includes a 32.4% increase in face masks and related textile products, 23.6% increase in medicines and a 46.4% increase in medical equipment. The domestic consumer market also bounced back: During the week-long October National Day holidays, 637 million domestic tourists travelled across the country, a 79% recovery rate of last year's level; and in September, the total domestic consumer spending registered a 3.3% increase from last year (NBS, 2020b). The total number of rural migrant labour employment has bounced back from the low point of

¹¹Migrants can enrol in the urban welfare programmes at their places of work by registering and making regular contributions through payroll deductions. They typically choose to forego this opportunity and prefer higher cash wages.

123 million in February to 179 million in September, surpassing the 2019 figure of 174 million (NBS, 2020b). For the entire year of 2020, the total number of migrant workers has reached 286 million, only a 1.8% decline (5.2 million) from 2019, and the average monthly wage of migrant workers has increased by 2.8% from 2019 (NBS, 2021). All these indicate that rural migrant workers' job losses during the lockdown were mostly temporary, and many of the dire predictions made in the early stage of the pandemic—such as prolonged economic recession, radical decline in employment, massive loss of wage incomes and rapidly rising incidences of poverty (Barrett, 2020; He & Gan, 2020)—have been proven wrong.

We are not disputing the fact that the rural economy suffered a blow or that tens of millions of rural migrant workers incurred wage loss or job loss during the pandemic. Our field data echoed these findings. We do, however, dispute the attribution of the greater losses experienced by the low-skill and low-wage workers to their *hukou* status and the undifferentiated treatment of the rural population as a whole. Glaring disparities in education and other public service provisions exist between rural and urban areas across the developing world, with or without the *hukou* system. The precarity of rural migrants' work is determined by the disadvantageous market positions they occupy due to their low education and skill levels, not their *hukou* status. Their lower human capital is a result of the unequal provision of education and other resources between rural and urban areas, which their rural *hukou* correlates to but does not give rise to.

Furthermore, as the case of Norwind shows, the rural population's economic activities are far more diverse than just migratory wage employment, and villagers—all rural *hukou* holders—have different class positions and profiles of vulnerability not because of their *hukou* status, but because of their unequal possession of various forms of capital and differentiated participation in labour, land and capital markets. For example, our findings suggest that the more integrated agricultural producers are into an industrialized commodity chain—as in the case of the chicken producers—the more vulnerable they become to external disruptions such as the pandemic.

It is also important to note that none of the lockdown or quarantine measures adopted by the central and local governments used *hukou* to differentiate treatment. During the early months of the pandemic, people from Hubei Province indeed faced discriminations in forms of more stringent quarantine measures or even denial of entry; these, however, were regardless of *hukou* status but based on exposure in Hubei.

Findings in this study indicate that the rural economy and rural communities can have a degree of resilience and flexibility in a time of crisis that their urban counterparts may lack. The diversified economic structure that many villages in China have, we believe, contributes positively to community resilience in at least two ways. First, it creates diversified profiles of risk and vulnerability within the community, so that even when a major crisis strikes, the impacts will be differentiated and there will still be winners, not just losers, which helps to retain the economic vitality of the community. Second, the existence of diversified economic activities makes it possible for the circuits of commodity to be temporarily reconfigured to address urgent local needs, as we have seen in Norwind.

Due to the inferior public health infrastructure, rural communities, however, are indeed more vulnerable once they are hit by the pandemic. In January 2021, four local outbreaks of the disease occurred in China, three of which—one in Beijing's Shunyi District, one in Shijiazhuang, Hebei Province and one in Wangkui, Heilongjiang Province—were the country's first three rural clusters of outbreaks. The Shijiazhuang case is particularly illuminating of rural communities' vulnerabilities under the pandemic. In urban areas, people are far more likely to seek medical help when feeling sick, and medical professionals are far more capable of accurately diagnosing, reporting and treating cases of infection. In this case, however, multiple villagers in a cluster of villages near the Shijiazhuang Airport developed COVID-19 symptoms in December 2020. Some sought no treatment; others went to village clinics but were only treated for cold symptoms, as the rural clinics lacked the capacity to test for COVID-19. Not until one villager visited a large hospital in Shijiazhuang city was the case properly diagnosed and the outbreak detected—but already too late to stop the spreading. The provincial government then intervened and relocated the entire populations of several villages into quarantine centres. This experience shows that effective preventative measures that block the pandemic from reaching rural areas—draconian as they may appear—are crucial for protecting the rural communities that are particularly vulnerable to public health crises.

4 | THE AGRI-FOOD SYSTEM AND THE PANDEMIC: CONNECTIONS, CHANGES AND CONSEQUENCES

The COVID-19 pandemic has given rise to a complex food crisis on a global scale (Schmidhuber, 2020). As rural areas are the main sites for agri-food production and rural population the main workforce, the impacts of the pandemic on rural areas must also be assessed in the agri-food system. China's experiences during this pandemic may not be the most revealing in exposing the fragility and flaws of the globalized capitalist food system of our time. Clapp and Moseley (2020) identified three impacts of the pandemic as a food crisis: food supply chain disruptions, food access and food system livelihoods risks and uneven food prices, all of which have been found in our case and in China in general. The severity of these impacts, however, is much lower in China than in other countries.

Besides the reasons mentioned earlier, such as the short duration of the lockdown, the promptness and effectiveness of disease-control measures, and even the fortuitous timing of the outbreak, some characteristics of China's agri-food system also helped to mitigate the pandemic's impact. First, China is not overly dependent on food import. The large amounts of imported soybean and maize are primarily for edible oil and livestock feeds, but the country maintains a high degree of self-sufficiency in cereals, vegetables and meat. China is also the largest holder of the global cereal stocks (49%) (Clapp & Moseley, 2020). All these ensure that the national government has a strong ability to keep domestic food supply and food prices in control. Second, as we argued above, the diversity in the local agri-food system contributes to community resilience. In the densely populated parts of the country, virtually all essential foods are produced within the local region. Although at the household level the diverse cropping strategies of the traditional Chinese peasantry have mostly been abandoned by today's commercialized farmers, at a regional level, there is at least the co-existence of a diverse set of specialized commercial agricultural productions, which together can serve the food needs of the local population in times of supply chain disruptions.

The pandemic, however, has indeed exposed a worrying development in China's agri-food system, and the post-pandemic remedies may further worsen this trend. Zoonotic diseases are infections caused by viruses like the SARS-CoV-2 that originate in animals but have crossed the species barrier. In both the SARS pandemic in 2003 and the current COVID-19 pandemic, it was believed that the disease originated from animals raised in the food system in China, although no definitive proof yet. In both incidences, China's food system was put under scrutiny and subjected to criticism; it became framed as a suspect, a problem that needs to be corrected (Lynteris & Fearnley, 2020).

During the pandemic, one group of farmers in China who suffered the most devastating blow were those who specialized in raising 'wild and exotic animals' in captivity, most notably, rhizomys—a variety of large rodents locally known as the Chinese bamboo rats, valued for their tender and tasty meat. At the early stage of the pandemic, when the origin of the new coronavirus was linked to these animals, the central government hastily decided to ban all production of these animals. The National Congress passed a new Decree on the Comprehensive Ban of the Trading of Illegal Wild Animals on 24 February, intended to eliminate all wild animals from both the food system and people's diet. Although rhizomys were not explicitly identified, many local authorities ordered producers to stop selling, transporting and consuming the animal until further notice. Till this day, these restrictions have not been lifted. In Guangxi Province alone, there are over 100,000 people involved in raising a herd of 18 million rhizomys, accounting for 70% of the national productive capacity (Gu, 2020); they have all but lost their investments and this important source of income.

Although it is too early to know what other new regulations will be introduced, we can be certain that, in the aftermath of the pandemic, public health concerns will be even more forcefully introduced into the regulatory regime in China's food system. Judging from the trend in the past decade, we argue that these new regulatory changes to China's food system can in fact inadvertently make the system more vulnerable to the emergence of new pathogens and the breakout of both human and animal pandemics.

Broadly speaking, regulatory changes in the past decade have been creating more favourable conditions for increasing the industrialization in production, concentration in processing and distribution and super-marketization

in retail, all of which have progressed especially rapidly in the animal-based food sectors (Schneider, 2017; Zhang & Zeng, 2021). Specifically, this means the implementation of public health, hygiene and environmental regulations that favour large-scale, industrial animal feedlots over small-scale family farms, corporate slaughtering and packing facilities operated by vertically integrated, 'dragon-head' agribusiness over small butcher shops and modern supermarkets over traditional wet markets.

On the production side, new national-level environmental zoning plans have already designated massive areas in southern China, traditionally the hub of the country's pig-farming sector, as water protection zones where pig farming is either entirely prohibited or only allowed in large-scale, modern facilities (Ministry of Agriculture [MOA], 2015). Similarly, the National Regulation on Live Pig Slaughtering, which took effect on 1 January 2008, restricted all slaughtering to designated slaughterhouses that have passed state inspection and obtained approval. On the retail end, the traditional wet markets that used to be a mainstay in food retail in Chinese cities have long been stigmatized in the modernization discourse as an obsolete holdout from a backward past, a place characterized by food products of suspicious origins and poor qualities, unhygienic conditions of processing and selling, lack of traceability and regulation and a source of pollution and other nuisances to urban residents (Zhang & Pan, 2013). The belief that the outbreak of both SARS in 2003 and COVID-19 started in wet markets—then in Guangzhou and now in Wuhan—will no doubt further tarnish the reputation of wet markets and hasten their demise (Lynteris & Fearnley, 2020).

The irony, however, is that it is actually the industrial food system, epitomized by the large-scale animal feedlot, that is accelerating the process of viruses crossing species barriers and creating the succession of new human and animal diseases that we have seen in this century (Akram-Lodhi, 2020). As Wallace (2016) puts it memorably in his study of the linkage between industrial farming and infectious disease: 'big farms make big flu'. The entire production process in industrial feedlots and slaughterhouses is 'organized around practices that accelerate the evolution of pathogen virulence and subsequent transmission' (Wallace et al., 2020). Furthermore, the rise of small farmers specializing in raising 'wild animals' is not spurred by some newly emerged appetite of urban consumers for wild animals but rather—as Akram-Lodhi (Akram-Lodhi, 2020) argues—a direct result of the expansion of industrial farming: Small farmers, who are unable to compete with industrial feedlots on traditional livestock, seek refuge in these so-called 'wild animals' to continue their precarious social reproduction. As a result, agro-industrialization now puts the food system on two sets of wheels that are driving the evolution and transmission of the next virus ever faster—on one hand, the industrial feedlots and slaughterhouses that are increasing the scale, speed and density of animal feeding and killing; and on the other, small farmers who are pushed into searching for new animal species to bring into the food system.

The government's technocratic responses to the pandemic (Leach et al., 2021), therefore, may in fact produce the outcome they are intended to eradicate. Besides potentially speeding up the emergence of the next zoonotic spill over and a new pandemic, these changes are also reshaping the economic structure in the agri-food system, replacing small, independent family farmers with large agribusinesses. We believe, in China's case, these structural changes to the food system will have greater long-term impact on rural livelihoods and inequalities than the short-term impacts of the pandemic itself and the lockdown measures.

ACKNOWLEDGEMENT

Data collection of this research was supported by The National Social Science Fund of China (Project number: 20CSH020, PI: Zhanping Hu), from the National Office for Philosophy and Social Sciences.

DATA AVAILABILITY STATEMENT

Data are available upon request from the authors.

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How to cite this article: Zhang QF, Hu Z. Rural China under the COVID-19 pandemic: Differentiated impacts, rural-urban inequality and agro-industrialization. *J Agrar Change*. 2021;21:591–603. <https://doi.org/10.1111/joac.12425>