



# Effects of COVID-19 on the GDP, Indian Agriculture, and Rural Lives

**Shivani Ahalawat <sup>a++</sup>, Megha Sahu <sup>b+++\*</sup>, Gaurav Sharma <sup>a++</sup>,  
Biplove Bala <sup>c++</sup>, Anuj Mangain <sup>d#</sup>, Vipin <sup>e†</sup>,  
Pradeep Kumar <sup>f‡</sup>, Megha Raghavan <sup>g^</sup>  
and Patel Parthavi Kirtikumar <sup>h##</sup>**

<sup>a</sup> Department of Genetics and Plant Breeding, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, Uttar Pradesh-250110, India.

<sup>b</sup> Department of Agricultural Economics, BM College of Agriculture Khandwa, R.V.S.K.V.V. Gwalior, M.P, India.

<sup>c</sup> Department of Entomology, College of Agriculture, Vellayani, Kerala Agricultural University, Thrissur, Kerala, India.

<sup>d</sup> Biology Division, Physics Wallah, Noida, Uttar Pradesh-201309, India.

<sup>e</sup> Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur, Bihar-848125, India.

<sup>f</sup> Department of Agricultural Biotechnology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, Uttar Pradesh-250110, India.

<sup>g</sup> College of Agriculture, Kerala Agricultural University, Padannakkad, Kasargod, Kerala, India.

<sup>h</sup> Department of Biochemistry, Anand Agriculture University, India.

## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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<sup>++</sup>Research Scholar;

<sup>#</sup>Professor;

<sup>†</sup>Subject Matter Specialist;

<sup>‡</sup>Phd;

<sup>^</sup>Assistant Professor;

<sup>##</sup>M.Sc. agri.;

<sup>\*</sup>Corresponding author: E-mail: meghasahu2810@gmail.com;

## ABSTRACT

This review paper explores the impact of the COVID-19 pandemic on agriculture in India. Agriculture is a critical sector of the Indian economy, employing millions of people and contributing significantly to the country's GDP. The pandemic and the ensuing lockdowns have had far-reaching effects on the agriculture sector, affecting every aspect of the supply chain. Governments have swung into activities since the Coronavirus assault made an extraordinary circumstance. Rules given by the Ministry of Home Affairs, Government of India on 15 April 2020 after the expansion of lockdown till 10 May 2020, excluded agribusiness, agriculture, creature farming, poultry, fishery, and partnered exercises from lockdown limitations; workers can go to work, markets are to open, acquirement is to occur and Agri-input shops and agro-handling focuses are to work. MNREGS work will likewise initiate. The study also explores the impact of labor shortages and farmers' challenges on crop production, reducing crop yield and wastage of produce. The research papers also present the decline in the prices of agricultural commodities due to the reduced demand during the pandemic and the closure of mandis and initiatives of the Indian government.

*Keywords: COVID-19; GDP; Indian economy; agriculture in India; farmers in India.*

## 1. INTRODUCTION

India has taken proactive action to stop the spread of COVID-19, asking for a nationwide lockdown for its 1.3 billion people starting on March 25. The epic coronavirus has typically expanded in India recently compared to other countries, and the number of specific diseases has been limited up to this time, with 5,274 cases and 149 fatalities as of April 8. The rapid expansion of COVID-19 cases, however, has raised serious concerns about the disease's latent potential for dissemination and impact. India has to be ready for a possible flood. Overall testing needs to be increased. The government compares the COVID-19 pandemic to the 2009 H1N1 flu pandemic, therefore the spread is most likely not going to be even. It intends to maintain a complete lockdown in "hotspot" zones once the 21-day period is through while easing it up in other areas. In the initial stage, India declared a three-week nationwide lockdown till mid-April; this lockdown has since been extended to May 3 to achieve mutually accepted containment of the illness spread. The worldwide Covid-19 epidemic, which has its roots in the Chinese region of Wuhan, has reached every corner of the globe and is influencing every aspect of the financial system [12-16].

These measures may help to contain the health emergency, but, as in other countries, the complete shutdown of all financial activity aside from essential services will cause a financial emergency and wretchedness for the poor, with significant job losses and rising nutritional fragility. For India, the financial shock would likely be far more severe for two reasons. Before

COVID-19, the economy had first begun to slow down again, compounding pre-existing problems with unemployment, poor pay, provincial unrest, declining health, and wide-ranging inequity [17-21]. Second, the sizable informal market in India is especially defenseless. Around 91% (422 million) of the 465 million experts working in the country as a whole in 2017–18 were casual workers. These horticultural, vagrant, and other casual laborers would be hardest hit during the shutdown period since they did not get regular pay rates or salaries. Here, the study focus on the plausible impacts on agriculture, supply networks, nutrition, food security, and occupations. Temporary employees won't have the option of returning soon away even if they have worked out how to do it. Given the struggles some may have endured following the lockdown, others may also not want to return. Between the first Industrial Policy and the Micro, Small, and Medium Enterprises Development Act, the sector has experienced several enactments and revisions in the policies and programs for better performance [22,23]. Even with several flaws in the plan proposal, insufficient infrastructure, inadequate training, incomplete credit facilities, a higher illness rate, and other issues, it has established a highly recognized position in India's socioeconomic system. Both mitigation and recovery strategies are necessary to assist the impacted, help them regain control over their life, overcome the tragedy they were supported by, and improve it. As COVID 19 moves on, cautious actions including maintaining social isolation and hand washing should continue.

The implementation of lockdown measures and travel restrictions resulted in a significant reduction in industrial activities, transportation, and energy consumption. This sudden decline in human activities led to a notable improvement in air quality, with reduced emissions of pollutants such as nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>2.5</sub>). Satellite images and air quality monitoring data revealed a significant drop in pollution levels, offering temporary respite to heavily polluted regions [9-11]. The COVID-19 pandemic led to a substantial reduction in carbon emissions globally due to decreased economic activity and energy demand. However, it is important to note that this reduction is temporary and not a sustainable solution to climate change. As economies recover, there is a need for green recovery plans that prioritize low-carbon technologies and renewable energy sources to achieve long-term emissions reductions [24-26].

The pandemic has posed challenges to environmental conservation efforts. Due to resource constraints and diverted attention, activities such as conservation research, monitoring, and enforcement of environmental regulations have been affected. Protected areas and ecosystems face increased threats, including poaching, illegal logging, and habitat degradation. Addressing these challenges requires renewed efforts and resource allocation to safeguard the environment and biodiversity.

## 2. REVIEW OF LITERATURE

Kumar et al [1] COVID-19 was a pandemic in India, with cases steadily increasing since January 30, 2020. This study predicted trajectories of trajectories associated with COVID-19 in the coming days in India using an Autoregression integrated moving average model (ARIMA) and Richard's model. By April 2020, the incidence of new cases was predicted to be 5200 (95% CI: 4650 to 6002) versus 6378 (95% CI: 4904 to 7851). Estimated suggest that there will be 197 deaths and a drop in recovery rates will reach around 501 (95% CI: 245 to 758) by April 2020. These estimates can help to strengthen the implementation of strategies to increase the health system capacity and enactment of social distancing measures.

Shirsath et al [2] Observed that the COVID-19 pandemic's effects on labor shortages have put Northwest India's intense and high-yielding rice-wheat system at risk. In the states of Punjab and Haryana, this might result in major output losses and economic losses. Delaying the transplanting

of rice may also make agricultural burning's seasonal air pollution worse, which might lead to a Covid rebound in the autumn. Emerging restrictions can be addressed with the aid of technological and managerial advances, but effective scaling of these solutions requires regulatory actions.

Mahendra Dev S and Rajeswari Sengupta [3] The paper "Covid-19: Impact on the Indian Economy" discussed the health risk in rural areas. The problem is indeed more solemn in inner-city areas due to high compactness, but it can spread to 70% of India's inhabitants who live in rustic areas. Migrant workers have returned to rural areas, and there is a risk of Covid-19 dispersion to the grower, agricultural laborers, workers, and others working throughout the food supply chains. The cultivation and rural inhabitants must be sheltered as societal aloofness will be experienced comparatively less in rural areas.

Kumar et al [4] examined the causes that led to the serious disruption of farming systems and the agricultural industry after the lockdown, with a particular focus on the Indian state of Uttar Pradesh. It concludes that the April harvest was significantly impacted by the scarcity of migrant labor in some locations and the excess of workers in others, which resulted in crucial crop losses as well as a fall in agricultural wages in some communities and an increase in others. Additionally, the partial closure of rural markets and purchasing alternatives, along with an inadequate supply of goods, caused a lack of food supplies and sharp price increases, which mostly impacted the poor and urban residents.

Sharma et al [5] This study compares and assesses the socio-economic implications of the 1918 influenza pandemic and the COVID-19 pandemic in India. It uses a systematic literature review (SLR) to categorize the findings into four subsections: a comparison of the 1918 influenza and COVID-19 pandemics in a global context, the economic consequences of a pandemic in India, the social consequences of a pandemic in India, and the pandemic mitigation measures adopted by India. The findings suggest that developing countries face more severe implications of such pandemics than developed countries.

### 2.1 Points of Studies

1. This paper examines the difficulties faced in Indian agriculture during COVID-19.

2. Know about the Indian government's responses.

### **3. SEARCH STRATEGY AND INCLUSION EXCLUSION CRITERIA (METHODOLOGY)**

The initial part of the research was the extraction of academic publications from several databases, including EBSCO host Research.

Database, Emerald Insights, Google Scholar, JStor, Sage Journals, Science Direct (Elsevier), Scopus, and Web of Science.

This study has employed secondary data that has been gathered from a variety of published sources, including books, journals, newspapers, magazines, and websites.

### **4. INDIAN ECONOMY IN THE PRE-COVID-19 PERIOD**

India has seen a substantial economic downturn as a result of the shock of the Covid-19 outbreak, with GDP growth decreasing to 4.2% in 2019–20, the lowest level since 2002–09. In Q4 2019–20, industry, which makes up 30% of GDP, contracted by 0.58%, and unemployment rose to a 45-year high. According to statistics from the CMIE (Centre for Monitoring Indian Economy), private-sector investment has been shrinking. Between 2015–16 and 2019–20, the overall number of active investment projects will have decreased by 2.4%, while the number of newly announced projects would have decreased by 4%. Spending on consumption had been declining for the first time in decades. Sales of passenger automobiles and consumer durables increased less than expected in February 2020, according to high-frequency indicators of urban consumption demand Fig. 1(a,b).

Motorcycle sales and the consumer nondurable category were two rural consumption indicators that were still declining in February 2020, showing a lackluster rural demand. Any possibility of a recovery in consumer demand and private investment would have been muted by the lockdown.

### **5. CHALLENGES DURING EARLY PHASES OF COVID 19**

When crops like wheat, gram, lentil, mustard, and rice are at the harvestable stage or on the

verge of development, the COVID-19 pandemic has a devastating effect on the homestead economy in India. Additionally, this is the time when ranch crops are brought to the mandis (advertising yards) for operations of assured purchase by designated government organizations. As they are crucial for both harvesting duties and post-harvest treatment of product away and displaying foci, the Union Home Ministry has instructed to reject the development of ranchers, ranch employees, and collecting and planting associated machinery from the realm of lockdown. The specifications for official equipment during the lockdown are the most crucial information in this essay. Making food grains, agricultural products, and other necessities available to consumers is one of them. Others include shipping open appropriation framework (PDS) items to last-mile delivery services, distributing goods to the poor, and the Union Home Ministry's round-deferring restrictions on the movement of ranchers and farmworkers between and within States, as well as collecting and related homestead equipment.

Additionally, due to a lack of labor and transportation challenges, the supply of dairy products, fish, poultry, and other things has been negatively impacted by the lockdown. Additionally, due to a lack of labor and transportation challenges, the supply of dairy products, fish, poultry, and other foods has been negatively impacted.

### **6. CHALLENGES DURING MID AND LATER PHASES OF COVID 19**

In each disaster or epidemic, the poorer sections of society are the ones that suffer the most. To protect the lives of every citizen, create elective highways for individuals reliant on agriculture and associated activities, enhance vital coordination, promote web-based businesses and conveyance organizations, and aid small- and medium-sized businesses, the government must take action. Approaches should promote easy access to hardware through state entities, FPOs, and CHCs and look into leveraging NREGS assets to pay for part of the ranch labor to prevent a lack of homestead labor. The government must establish free support lines and contact centers and make agricultural inputs accessible. Agri-inputs must be placed for easy access, the private sector must play a significant role in providing arrangement support, and State Governments must set up their infrastructure for easy acquisition activities of ranchers'

attractive surpluses. Institutional loaning of harvest advances should be encouraged and extended.

Ventures should not be removed from the vital division during the COVID-19 epidemic to avoid irreparable harm to the rural economy. To bring better ventures into the agricultural portion and spur its growth, advantageous ventures like land leasing, contract farming, and private horticulture markets should be deliberated. In 2018–19, India's agriculture prices were estimated to be worth 38 billion US dollars, but with the right tactics, they may rise much higher. The government is now working on influencing consumer behavior with the proper programs and impetuses after expanding its attention to food security and increasing ranchers' compensation. The existing scenario of strategic motives that favor the two main staples, wheat, and rice, must shift to accomplish these aims.

### 7. DIFFICULTIES FACING IN INDIAN AGRICULTURE DURING COVID 19

1. Barriers between the growth of rural goods and important motorways.
2. Disruptions in the variety of homestead harvests sold by private sellers.
3. Limited Agricultural Produce Market Committee mandis duties.
4. Paucity of workers needed to harvest the rabi crop.
5. A shortage of drivers in the transport sector.

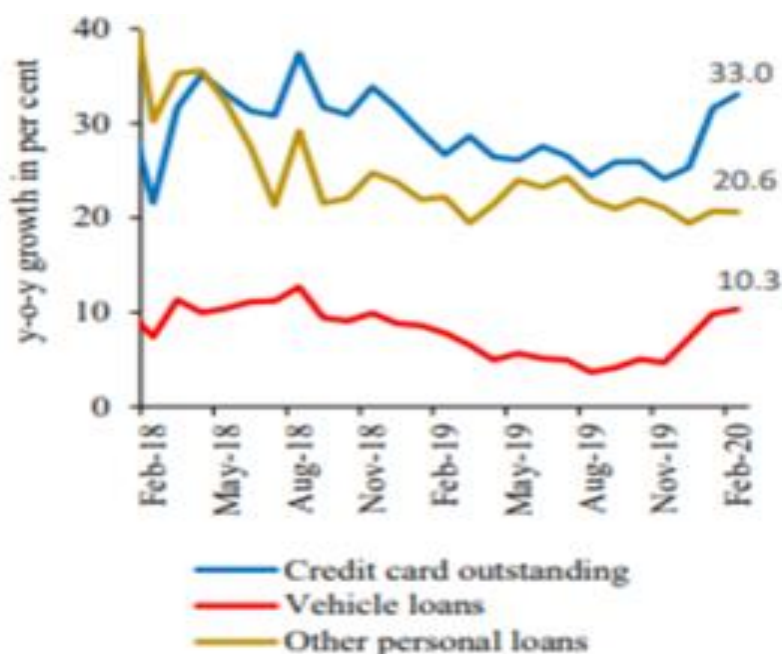
6. Interruptions in government organizations' purchases of food grains.
7. Closures in the retail agricultural marketplaces. Wheat, grapes, watermelons, bananas, muskmelon, chana, cotton, chiles, turmeric, cumin, coriander, onion, and potato are just a few of the crops affected by these factors.

### 8. AGRICULTURE AND RURAL ACTIVITIES

The population of the nation depends heavily on the agricultural industry, and rural demand is greatly influenced by it. Before Covid- 19, agricultural GDP grew by an average of 3.3% annually. According to preliminary estimates from the National Statistical Office (NSO), GDP growth jumped to 4% in FY20 from 2.4% in FY19. However, due to bumper agricultural and horticultural output from 2016–17 to 2018–19, the terms of trade have shifted against agriculture. In comparison to the actual growth of 4% in 2019–20, the nominal increase the agricultural GDP was 11.4%. Due to the slump in the construction industry, rural wage growth was muted before the Covid-19 era Fig. 2 (a,b).

Compared to industries and services, agriculture has seen significantly less of Covid-19's negative effects. However, the initial lockdown did have an impact on agricultural operations and the required supply chains across several channels, including input distribution, input acquisition, harvesting, transport challenges, marketing, and processing.





**Fig. 1(a) High frequency indicators- urban demand; Fig. 1(b) Household credit**

Source- RBI 2020

According to a study by Narayanan [6], farmers were left with harvest when the initial lockdown was implemented in March because APMC (agricultural product market committee) mandis shuttered in numerous states, causing a disruption in the food chain from production to consuming centers. The government should prioritize efforts related to post-harvest, wholesale, and retail marketing, and start procurement procedures. State governments in certain states have already taken action.

There is proof that during the first several days of the lockdown, agricultural and food supply networks suffered, despite being regarded as critical services. However, activity seems to have somewhat recovered during the past two months as farm markets adjusted to the shutdown. As a result, originally rising costs for vegetables and grains are now declining.

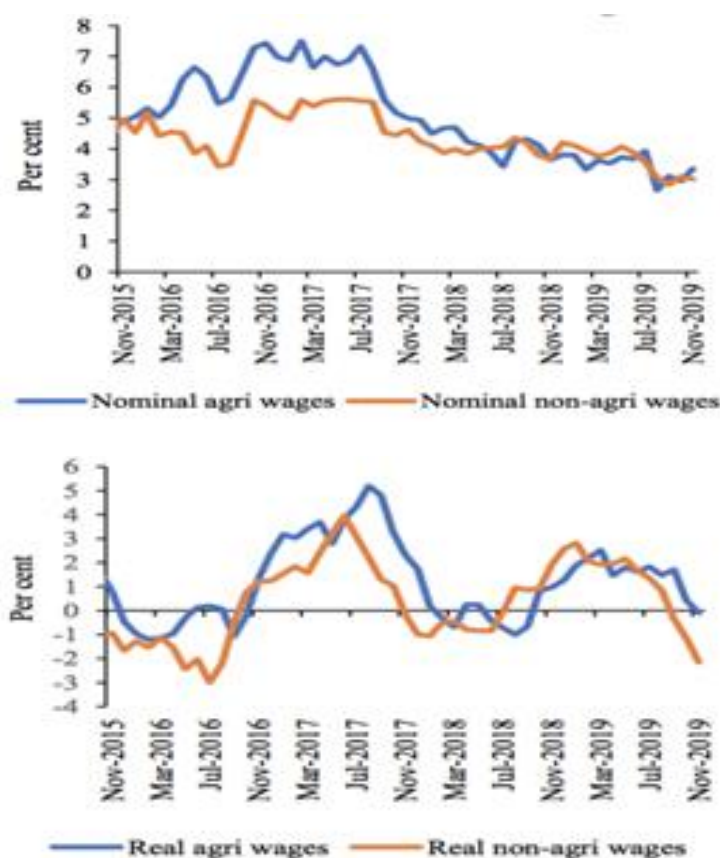
It should be mentioned that employment and non-farm incomes in rural regions have been increasing. In reality, according to a NABARD survey, if we take into account all rural families, just 23% of rural income comes from agriculture (cultivation and livestock). A little over 44% of revenue comes from wage employment, 24% from public and private services, and 8% from other businesses. It demonstrates that the non-farm sector is the primary source of income in

rural regions. Due to slower real wage growth before COVID-19, rural incomes were impacted in part. According to media reports, migratory laborers from the city are causing a decline in rural salaries. However, urban communities have been more impacted by the lockdown than rural ones. The rural recovery surpassed the urban one in June and July 2020. Additionally, the need for tractors increased in rural regions.

## 9. THE ECONOMIC CHALLENGES TO FARMERS

Over 55% of the 263 million people employed in agriculture or the agricultural industry in India, according to the Government of India, work directly on farms (such as migrant laborers). Before COVID-19, India's agricultural GDP has grown at an average annual rate of roughly 3.2% from 2014 to 2019 [7].

The National Statistical Office of India [8] forecasted 2.4% to 3.7% growth from fiscal year 2019 (FY19) to fiscal year 2020 (FY20). This expected increase has been replaced by a significant fall of roughly 5% in the first quarter (Q1) of FY20 due to the lockout. According to [7], agricultural GDP in India is increasing, which is generally inverse to wage growth in the agriculture industry.



**Fig. 2(a) Growth in nominal rural wages; Fig. 2(b) Growth in real rural wages**  
 Source- RBI 2020

In general, nominal wage growth can be linked to market circumstances for agricultural products. Against this backdrop, it appears that present agricultural production in India is far greater than demand. This means that, despite India's overall good long-term development as indicated by GDP, many Indian farmers were already economically disadvantaged before COVID-19. This shows that the interruptions caused by the lockdown in lowering agricultural food supply were possibly beneficial, at least to those farmers who were able to bring their commodities to market.

### 10. INITIATIVES BY THE GOVERNMENT OF INDIA, ICAR, AND LOCAL GOVERNMENTS

Following the declaration of the lockdown, the Indian Minister of Finance announced financial assistance totaling INR 1.7 lakh crore (24 billion US dollars), which will protect 800 million people nationwide from the negative effects of the pandemic and vulnerable communities. The PM

KISAN (Pradhan Mantri Kisan Samman Nidhi) plan, which would front-load a cash installment of INR 2000 to all farmers in 2020–21 with the first installment due by April 2020, may play a role in this to some extent. This program would give Indian farmers INR 2000 three times after every fourth month. The Government of India also raised the wage rates for workers engaged under the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) / National Rural Employment Generation Scheme (NREGS), one of the world's largest wage-guarantee schemes.

As part of the "Atmanirbhar" package, the government announced the following initiatives for agriculture in May 2020.

1. Farm-gate infrastructure for farmers is funded by the Rs. 1 lakh crore Agri Infrastructure Fund.
2. Fishermen funded with Rs. 20,000 crores under the Humanitarian Matsya Samparda Yojana

3. Scheme for formalizing Micro Food Enterprises worth Rs. 10,000 crores
4. \$15,000 crores Infrastructure Development Fund for Animal Husbandry
5. For the advancement of herbal cultivation, \$4000 crores
6. 500 crores rupees will be used towards beekeeping projects
7. 500 crores of rupees would be spent on enhancing fruit and vegetable supply networks.
8. Foot and Mouth Disease (FMD) and Brucellosis National Animal Disease Control Programme began with a total expenditure of Rs.13,343 crores

## 11. KNOW ABOUT THE INDIAN GOVERNMENT'S RESPONSES

1. The Essential Commodities Act is being amended to provide farmers with better price realization.
2. Agricultural Marketing Reforms are being developed to give farmers with marketing options.
3. Produce Price and Quality Assurance is being developed to enable farmers to engage in fair and transparent negotiations with processors, aggregators, major retailers, and exporters.
4. Agriculture changes are included in the policy package, although infrastructure development funding and reforms are only beneficial in the long run.
5. The most crucial information is that the majority of agricultural activities will be carried out on a basic scale, with farm workers in the fields, ranchers engaged in cultivation work, offices filled with agribusiness merchandise, and intra-state development of harvesting and planting-related machinery and assembling, bundling units of composts, pesticides, and seeds.
6. The 2000-rupee PM-Kisan installments due to ranchers will be paid in full, and daily MGNREGS salaries will increase from 182 to 202 rupees.
7. The Reserve Bank of India (RBI) has announced a quarter-year-long limit on rural-term lending, including agricultural advances. The advance payment paid to ranchers as part of the PMKisan program is not even a bundle, in contrast

to how other governments have responded. This money was supposed to be paid between April and June.

## 12. CONCLUSION

The outbreak of the Coronavirus in the Wuhan region of China in December 2019 has had a significant negative impact on the global financial system. The externalities of the Covid-19 eruption also affect the most resilient sector of agriculture, which serves as the backbone of the country. The lockdown caused by the coronavirus has turned out to be a dark opportunity for the farming community, with the returns to the growers likely going to decline and the limits on the transportation of agricultural goods from their site of production to the final consumer have been restricted. The manpower scarcity brought on by the fear of viral spread has resulted in the loss of gathered goods, primarily perishable fruits and vegetables, in the farmer's field itself. The producer, transporter, distributor, retailer, and customer-last web of the agriculture item shop network has the potential to be impacted by the corona infection pandemic. The planning of the Kharif and Rabi crops has also come to a stop, which would significantly hinder progress over the upcoming agricultural seasons.

Following the lockdown, tens of thousands of people fled the big cities due to unemployment and went back to their rural communities to escape the strains of raising a family in expensive urban areas.

India faces a unique issue with COVID-19 because its massive population and economy rely on unorganized labor, making lockdowns and other social segregation measures very disruptive.

Although the central and state governments have vigorously responded to the problem, this should only be the first step and to support the poor and farmers in particular, the government introduced a variety of relief programs. These programs, however, have proven insufficient and are not meeting farmers' needs. India must be prepared to scale it up as events develop, mitigating the effects on the economy by increasing public program support and regulations that maintain the integrity of the market.



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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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