

Impact of covid-19 pandemic on agricultural production and food system in India

Sayyed Juned Allahbaksh ^{1,*}, Nahire Dinesh Jagannath ²

¹ Department of Environmental Science, Arts, Commerce and Science College, Onde, Vikramgad, Palghar, Maharashtra India. 401605

² Department of Geography, Arts, Commerce and Science College, Onde, Vikramgad, Palghar, Maharashtra India. 401605

ABSTRACT

The pandemic Covid-19 has affected the life of the people in many ways. The nation's first priority was to save the lives of the people and that need has affected the Indian economy severely. It affects almost all sectors like agriculture, tourism, trade, transport, banking, industry, markets and services. India as well as whole world is suffering from COVID-19 disease. Most of the people of the world died due to this pandemic. Now a days vaccination prevents the death rate with rapidity of its application but no country in the world can prevent this terrible disaster permanently. Agriculture has been hit hardest by the pandemic. Covid-19 has affected not only the lives of farmers physically and mentally, but also hit them the hardest in economy. It breaks the backbone of the farmers. The farmers could not get seeds, fertilizers, pesticides etc. for crop production, the stake holders were unable to sell and distribute food grains; the consumers were unable to buy the food grains and vegetables and the stock of food grains and vegetables were rotten in the storage. Import and export of agricultural food products were totally stopped. So, India faced massive detrimental effects of the pandemic in last two years mainly in agricultural sector. The study affirmed that the Covid-19 disease has a significant impact on the Indian agricultural sector and its food supply chain, with huge effects on the most vulnerable population.

Keywords: Covid-19 Pandemic · Corona virus · Agriculture · Production · Food security

1. Introduction

Agriculture is one of the most important industries in India. It has been around for thousands of years in this country. It has evolved over time, and almost all traditional farming methods have been replaced by the use of new technology and equipment. In addition, due to a lack of resources, some small farmers in India continue to use old traditional farming methods. Furthermore, it is the only sector that contributes to the growth of not only the country's own but also other sectors. In terms of population, agriculture is one of the world's largest industries, feeding almost half of the country's population. It is also the most important food source for approximately 58% of the population. India is the largest nation growing various crops in different regions and the largest exporter of agricultural products in the world. Most of India's economy is spent on agriculture, and India's agricultural sector holds the record for her second largest land area in the world. The agricultural sector employs more than half of India's labor force. The majority of Indian farmers are poor local farmers. The COVID-19 crisis has devastated the lives of Indian farmers. Many agricultural areas were ready for the winter harvest. Winter harvest will be postponed after lockdown.

Since its outbreak in Wuhan province, China, in December 2019, corona virus disease (COVID-19) killed more than 6 million people globally [1]. In addition, more than 100 million people are estimated to have 'long COVID' globally, with the highest rates of long COVID-19 reported in Asia [2]. Thus the COVID-19 pandemic will have long-lasting effects on population health and wellbeing. In addition, supply chain

disruptions arising from government responses to control the pandemic, i.e. lockdowns and border closures, have led to a re-emergence of debates on the vulnerabilities of globalized value chains [3]. Thus, the supply of agricultural chain should be maintained active with a focus on the basics of logistic challenges. Finally, the pandemic and pandemic response led to the largest global economic crisis in more than a century with the world economy shrinking by approximately 3% and global poverty increasing for the first time in a generation [4]. Given that agriculture is the largest employer in most developing economies [5] and the important role agriculture plays in food security, an in-depth evaluation of this particular sector is warranted.

2. Overview of Covid-19 Crisis on agricultural production

The agricultural sector provides livelihoods, especially in large rural areas, and contributes significantly to India's domestic production [6]. India is an agriculture based country. The Indian socioeconomic condition is standing over the pillar of agriculture. In India, the majority of Indian people earns and makes their profits depending on agriculture as the major sector of employment. Any prolonged unusual event makes its impression over the economy of a country. In the 21st century, all the nations of the globe were exposed to the pervasive effects of infectious virus. This pandemic condition had been distorted the universal food and wage supply chain as a result of lockdown which was essential for all the nations to break the chains of

* Corresponding author. E-mail address: sayyedjuned2009@gmail.com

eradication of infectious virus. Like all the other nations, India had been threatened by the detrimental effects of the Covid-19 pandemic.

The important Government initiative to combat against the pervasive disease strains at that time was 'Lockdown' to protect the non-affected people and 'containment zone' to restrict the affected persons in a barrier to save the rest parts of the society. In this situation, the economy of India was destructed as the country depends majorly on agriculture for economy. A locked system tied the entire nation into several regional patches and resulted in complete breakage of agricultural production and supply chain of India. It was difficult to get seeds, fertilizers, pesticides *etc.* for agricultural production, the stakeholders were unable to sell and distribute food grains; the consumers were unable to buy the food grains and vegetables and the stock of food grains and vegetables were rotten in the storage. The extent of pandemic disruptions on agricultural food production, food security, nutritional security, supply chain, food prices and future projections of merchandise trade have studied by several researchers [7-17]. The supplies of food products were totally stopped. So, India faced massive detrimental effects of the pandemic in last two years mainly in agricultural sector.

3. Research Methods

3.1 Sampling and Data Collection

Primary data was collected through face-to-face interviews with different types of respondents, especially farmers. Secondary data was collected using information available in agriculture-related journals, books, research reports, government reports, various websites, and publications. Information was also collected through relevant agricultural organizations.

3.2 Preparing and analyzing information

A systematic review of literature was done for consolidation of important information of prevailing pandemic with its impact and effects identification. This is the specific method of primary data collection associated with screening of theories and generalization essential for descriptive research. This is a traditional method of collecting information about similar and related events and phenomena of documentation to enhance the potency of analysis and applicability. Screening of primary data about the pandemic, the sub-themes like vulnerability, effects, risks, agriculture, resistance and resilience *etc.* had been used for a decade. The applications of fundamental and conceptual framework in screening of literature for the classification of indispensable publications were analyzed in this study.

4. Results and Discussion

The pandemic created a panic situation in East Africa to India had a calamitous effect on agriculture [18]. Natural calamities such as cyclones and floods in different areas caused devastation adding to the misery. Most of the farmers in India faced a difficult time in Zaid season (April–June) and Kharif season (July–October) crops, harvesting Rabi (March–April) season crops and making their marketing decisions. According to WHO [19-21] this Covid-19 outbreak, caused by a corona virus is not just a public health crisis, but it will touch every sector of the country and individual involvement should be required to struggle and to mitigate this crisis from every corners.

The consequences of the world covid-19 pandemic on agriculture sector around the world require immediate and long-term actions. First of all, it is necessary to analyze and comprehend the immediate consequences of current pandemic on agricultural and food systems in order to develop necessary actions, therefore, the risks, vulnerability, resilience and systemic shifts of agricultural systems to adapt to the current situation need to be better understood [22-24]. Concerns have been raised regarding the negative implications of Covid-19 pandemic on farming. India's winter season crops such as wheat, gram and mustard are in the process of harvesting. Additionally, lentil and rice are in the harvest stage. The supply of fruits, vegetables and other perishable foods is at risk due to the disruption in the supply chain. This includes fresh dairy products, fish, and other foods that consumers rely on. Consumers in both rural and urban areas are seeking larger portions of these resources; this may cause severe damage to the entire supply chain. With few areas being moved to their original places, harvesting and post-harvest operations have been affected. Additionally, marketing centers haven't been able to access stored produce because of this migration. The home minister has removed farmers, farm hands and harvesting machinery from the lockdown area. During the lockdown, the government's biggest challenge is providing food grains, fruits, vegetables, and other essentials to people in villages and cities. Ensure that commodities are distributed in a safe manner to respected populations, while maintaining prescribed guidelines and protocol, particularly in regards to social distancing. With the continuation of lockdown during the rabi harvest season, farmers in our country are looking to the government for continuity in harvesting and market operations.

In the lockdown period, the government has the greatest challenge of making food grains, fruits, vegetables and other essential items available to people from the villages and cities. Supply chains should work easily and clearly, with moderate safety measures for people. Public distribution system items must be transported by both rail and road to last mile delivery agents by the related government agencies.

Distribution of the commodities to respected population, while maintaining prescribed guidelines and protocol, particularly of social distancing, must be safely observed. As the on-going lockdown coincides with the rabi harvesting season, farmers of our country look up to the Government to ensure uninterrupted harvesting of the crops as well as smooth marketing operations.

A Strategy for Agricultural Development

1. Best farming practices must be adapted and farmers must be encouraged.
2. Farmers must be in contact with agro-dealers, input suppliers, and agricultural institutions to create link between farmer and market.
3. The long-term development support rural agriculture commercialization.
4. Provide agricultural financing and marketing services properly.
5. To train the farmers regarding various strategies related to agriculture.
6. Government must provide irrigation facilities to the agriculture.
7. Empower farmer with providing many facilities like agricultural equipment and technology.
8. Distribution of capital, easily available loan etc.

5. Conclusions and recommendations

The study revealed that the prescribed bans and restrictions over external movement, transport and migration of labour showed a picture of destruction and disruption of domestic chain of food supply and consumer demand. This breakage of continuous flow resulted in rise of cost for essential commodities like grains, vegetables, animal proteins, milk etc. from retailer to wholesaler upto the production industry. There was although the blessings of buffer stock of previously harvested crops and grains that supported the huge Indian community but became insufficient when price hikes in essential goods were reported from majority of the consumers.

We observed that agriculture is suffered severely in the period of Covid 19 pandemic. The Covid-19 Pandemic has primarily harmed agriculture. The final condition of Indian farmer's has deteriorated due to covid-19 pandemic. The government has also tried its level best to mitigate the effects of the covid-19 pandemic. Government provides some assistance to the farmers but they were inadequate. The central and state governments must ensure that their schemes are properly implemented. Every needy farmer must get benefit from the government scheme, but it must run properly. To cope-up with this crisis, the Government should have to give more emphasis on the basis of economic conditions of the farmers and should provide long term

insurance for better future. COVID-19 has influenced the Indian agricultural systems from production and transportation to food distribution, consumption and trade.

Conflict of interest

The authors declare that there is no conflict of interest in this manuscript.

Data availability

The authors confirm that all data collected or analyzed during this study are included in this published article.

References

- [1] Our World in Data. Daily new confirmed COVID-19 deaths per million people Oxford: University of Oxford; 2022.
- [2] Chen C., Hauptert SR., Zimmermann L., Shi X., Fritsche LG. and Mukherjee B. 2022 Global Prevalence of Post COVID-19 Condition or Long COVID: A Meta-Analysis and Systematic Review. *J Infect. Dis.* 226(9):1593-1607. doi: [10.1093/infdis/jiac136](https://doi.org/10.1093/infdis/jiac136).
- [3] Miroudot S. 2020 Reshaping the policy debate on the implications of COVID-19 for global supply chains. *J Int. Busin. Pol.* 3(4):430–442. <https://doi.org/10.1057/s42214-020-00074-6>.
- [4] World Bank. World Development Report 2022: Finance for an Equitable Recovery. Washington DC: The World Bank; 2022.
- [5] World Bank. Employment in agriculture (% of total employment) (modeled ILO estimate) Washington, DC: World Bank; 2019.
- [6] Agriculture Census Division. All India Report on Input Survey 2016–17. New Delhi: Ministry of Agriculture & Farmers Welfare, 2021.
- [7] Reardon T., Bellmare MF. And Zilberman D. 2020 How COVID-19 May Disrupt Food Supply Chains in Developing Countries. In: Swinnen Johan, McDermott John, editors. COVID-19 and Global Food Security; Washington, D C: International Food Policy Research Institute (IFPRI). 78–80. https://doi.org/10.2499/p15738coll2.133762_17.
- [8] Harris J., Lutz D., Pal AA., Nair RM. and Ramasamy S. 2020 Food System Disruption: Initial Livelihood and Dietary Effects of COVID-19 on Vegetable Producers in India. *Food Sec.* 12: 841–851. <https://doi.org/10.1007/s12571-020-01064-5>.
- [9] Landry CE. and Smith TA. 2019 Demand for Household Food Waste. *Appl. Econ. Perspect. Pol.* 41(1):20–36. <https://doi.org/10.1093/aep/ppy037>.
- [10] Rawal V. and Verma A. 2020 Agricultural Supply Chains during the COVID-19 Lockdown. New Delhi: SSER Monograph 20/1, Society for Social and Economic Research. 1-19. <http://archive.indianstatistics.org/sserwp/sserwp2001.pdf>.
- [11] Mitravinda A. and Patil RS. 2022 Diet Diversity of Urban

- Households in India during the COVID-19 Lockdown. *Nutri. Health*.28(4):1–7. <https://doi.org/10.1177/02601060211019676>.
- [12] Varshney D., Roy D. and Meenakshi JV. 2020 Impact of COVID-19 on Agricultural Markets: Assessing the Roles of Commodity Characteristics, Disease Caseload and Market Reforms. *Indian Econ. Rev. Sprin. Ind.*; 55 (Suppl 1): S83–S103. <https://doi.org/10.1007/s41775-020-00095-1>.
- [13] Alvi M., Barooah P., Gupta S. and Saini S. 2021 Women’s Access to Agriculture Extension amidst COVID-19: Insights from Gujarat, India and Dang, Nepal. *Agricul. Syst.* 103035,188(2021):1-8. <https://doi.org/10.1016/j.agsy.2020.103035>.
- [14] Mishra K. and Rampal J. 2020 The COVID-19 Pandemic and Food Insecurity: A Viewpoint on India. *World Dev.* 105068,135(2020). <https://doi.org/10.1016/j.worlddev.2020.105068>.
- [15] Jribi S., Ben IH., Doggui D. and Debbabi H. 2020 COVID-19 virus outbreak lockdown: what impacts on household food wastage? *Environ. Dev. Sustain.* 22: 3939–3955. <https://doi.org/10.1007/s10668-020-00740-y>.
- [16] Visschers VHM., Wickli N. and Siegrist M. 2016 Sorting out food waste behaviour: a survey on the motivators and barriers of self-reported amounts of food waste in households. *J Environ. Psychol.* 45:66–78. <https://doi.org/10.1016/j.jenvp.2015.11.007>.
- [17] Secondi L., Principato L. and Laureti T. 2015 Household food waste behaviour in EU-27 countries: a multilevel analysis. *Food Pol.* 56(C): 25–40. DOI: [10.1016/j.foodpol.2015.07.007](https://doi.org/10.1016/j.foodpol.2015.07.007).
- [18] Timilsina B., Adhikari N. and Kafle S. 2020 Addressing impact of COVID-19 post pandemic on farming and agricultural deeds. *Asi. J Adv. Res. Rep.* 11(4): 28–35. DOI: [10.9734/ajarr/2020/v11i430272](https://doi.org/10.9734/ajarr/2020/v11i430272).
- [19] WHO (World Health Organization). (2020a). 2019 Novel Coronavirus (2019-nCoV): Strategic preparedness and response plan . https://www.who.int/docs/default-source/coronaviruse/srp-04022020.pdf?sfvrsn=7ff55ec0_4&download=true.
- [20] WHO (World Health Organization). (2020b). WHO Coronavirus Disease (COVID-19) Dashboard. <https://covid19.who.int/>.
- [21] WHO (World Health Organization). (2020c). WHO Director-General’s opening remarks at the media briefing on COVID-19. <https://www.who.int/dg/speeches/detail/who-director-general-s-openingremarks-at-the-media-briefing-on-covid-19---11-march-2020>.
- [22] Boughton D., Goeb J., Lambrecht I., Mather D. and Headey DD. 2020 Strengthening smallholder agriculture is essential to defend food and nutrition security and rural livelihoods in Myanmar against the COVID-19 threat: Elements for a proactive response. *The International Food Policy Research Institute.* 2: 1–11. DOI : <https://doi.org/10.2499/p15738coll2.133687>.
- [23] Cattivelli V. and Rusciano V. 2020 Social Innovation and Food Provisioning during Covid-19: The Case of Urban–Rural Initiatives in the Province of Naples. *Sustainability.* 12(11): 1–15. <https://doi.org/10.3390/su12114444>.
- [24] Henry R. 2020 Innovations in agriculture and food supply in response to the COVID-19 pandemic. *Molecul. Plant* 13(8): 1095–1097. doi: [10.1016/j.molp.2020.07.011](https://doi.org/10.1016/j.molp.2020.07.011).