



Impact-Losses, Reboot-Gain and Agricultural Effect during COVID-19 Pandemic

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Authors' contributions

This work was carried out in collaboration among all authors. Author AK designed the concept, wrote the protocol, and wrote the first draft of the manuscript. Authors BSP and AK wrote the final draft of the paper. Authors RK and BK managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

The emerging infectious diseases are increasing in frequency exerting significant impact on human health and severely threatening global economy. Now at present, the whole globe is facing the challenges evolved owing to Corona virus (COVID-19) pandemic, which has set the clock backwards on the developmental progress of several nations including India and pauses the global economy owing to repeated lockdowns. The agricultural sector owing to its diverse output (*crops, horticulture, dairying, fisheries, etc.*) only showed positive growth in Indian GDP (gross domestic product) despite various challenges faced by this sector especially labour shortage, transportation, marketing, etc. The central as well as several state governments also issued supportive steps to favour agricultural related activities and provided incentives to farmers to unlock growth. Still, there is

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necessity to support and promote digital platforms to scale up on an emergency basis and provide an outlet for the farmers' produce immediately. The government should think to build storage facilities on villages' level as well as brought policies to support pricing (minimum support price) for other nutritious cereals like sorghum and millets.

Keywords: Agriculture; COVID-19; GDP; global economy; lockdown; pandemic.

1. BACKGROUND

The incidence of Corona virus (COVID-19) pandemic clearly indicates that we are highly vulnerable to viral threats. As we know, our world is globally connected and any emerging threat in one part of the world is a threat not only to a single country but to everyone everywhere. Emerging infectious diseases (EIDs) are increasing in frequency, posing a significant threat to global economies and public health [1, 2]. The Infectious diseases account for a quarter to a third of mortality rate. These diseases usually become pandemic and cross the borders of different countries and severely threaten economic and regional stability as evident by HIV/AIDS, 2009 H1N1 influenza, H5N1, SARS epidemics and pandemics, Ebola outbreak [3] and now COVID-19.

The last outbreak of Severe Acute Respiratory Syndrome (SARS) in 2003 caused significant disruption and economic loss worldwide and is estimated to have reduced worldwide GDP by USD 40 billion in 2003 [4]. The 1994 plague outbreak in Surat, India cause economic loss of USD 2 billion [5]. Similarly, Ebola virus disease (EVD) outbreak in West Africa drastically drop the GDP growth to 0.5% in Guinea, which had otherwise been expected near about 4.5% before the emergence of Ebola crisis. In Liberia and Sierra Leone countries, GDP growth fell to more than half from 5.9 - 2.2% and 11.3 - 4.0%, respectively due to Ebola outbreak. Above disease outbreaks caused severe disruptions affecting all economic sectors including agriculture. Similarly, Avian influenza outbreaks also affected different economic sectors with major loss to poultry sector [6].

The earlier pandemic and or epidemic affected agriculture severely and the example is Ebola Virus Disease (EVD) that likewise present COVID-19 started to spread when crops were being planted and grew during the crop maintenance period and then expanded rapidly during the critical harvesting period for the staple rice, maize and cassava crops (*rabi crops in case of COVID*). Farm operations, inputs and harvesting were affected severely due to

reduction in farm labour because of quarantines, border closures, restrictions on people movement and ban on group work. At that time rice was the most affected commodity due to its higher labour and inputs requirement. In Liberia (*most severely affected country*), rice production was estimated to have declined by 12%, whereas it was dropped by 7 and 4% in Sierra Leone and Guinea, respectively. The impact was registered comparatively lower on maize and production was estimated to decline by 3 and 4% in Sierra Leone and Guinea, respectively [7].

Another example of pandemic disease on agriculture is HIV/AIDS. Much of rural agricultural production is highly labour-dependent and often labour demands are concentrated in specific periods of the year; say, sickness or funeral attendance may mean that the planting season is missed and with it, a full crop. Gross agricultural production is also affected by labour shortages. The FAO has estimated that in the 25 hardest hit countries in Africa, AIDS has killed around 7 million agricultural workers since 1985 and it could kill 16 million more before 2020. The most affected African countries could lose up to 26% of their agricultural labour force within a few decades and this loss in labour could have severe impacts on the national economy [8]. The loss of a productive generation means that livelihood skills including agricultural knowledge are not passed from generation to generation, leaving a young population ill-equipped to manage the impacts of the epidemic. Moreover, agricultural skills are often gender-specific and the sickness or death of a male or female household member can result in a weakening of the farming system. As a whole, any disease outbreak affects the agriculture sector severely due to labour scarcity, which in turn affects cropping areas and yields ultimately resulting in reduced food production and food insecurity [9].

1.1 COVID-19 and Reboot-Gain

Now at present, the whole globe is in the grip of Corona virus (COVID-19). A lockdown had been announced in almost every country including developed and developing nations. In some countries re-lockdown has been announced

keeping in view the second wave and new strain of Corona virus. Earlier (March-May 2020), due to lockdown all factories, markets, shops and places of worship were closed, most public transport were suspended and construction work halted, as many countries including India asked its citizens to stay at home and practice social distancing. As a result of rigorous travel restrictions and shutting down of non-essential activities including those of air polluting sectors, air quality improvement had been noted in many towns and cities across the globe. Data depicted that the main cities were recorded much lower levels of harmful microscopic particulate matter known as PM 2.5 and of nitrogen dioxide, which is released by vehicles and power plants [10].

With the humans busy isolating and quarantining themselves, the wild animals were reported roaming in the city streets with the major example of 'Spotted Malabar Civet', a critically endangered mammal not seen until 1990s resurfaces for the first time in Calicut town indicating, mother earth was rebooting [11]. The wild animals otherwise not roam freely or move in cities because of busy roads of bustling cities and metropolitan areas. Many examples had been appeared from different corners of the globe. Perhaps, because of drastic drop in air pollution level (cleaner air), negligible traffic and factories that were not working owing to lockdown and curfew imposed to check the spread of Corona virus (COVID-19), the residents saw the 'snow-clad Himalayan ranges' from their rooftops with naked eyes lies at a distance of 213 kilometers from Jalandhar city of India [12]. The people said they had seen this for the first time in their lives. The Himalayan mountain (Dhauladhar) range is around 200 km away from Jalandhar and has an elevation between 3,500 - 6,000 metres.

1.2 COVID-19 and Impact-Losses

Due to the outbreak of COVID-19 every citizen were locked at home. The pandemic and associated lockdown has not only caused enormous distress to the millions of poor and marginal farmers for saving their crops and livestock, but also influenced the overall poultry, dairy and livestock production systems and associated value chains, nutrition and health care and labour availability [13]. The COVID-19 outbreak had coincided with crucial stages of *Rabi* season crops especially wheat and oilseeds. Due to lockdown and curfew in many Indian states, farmers' movement to their respective fields had become very much limited.

For instances farmers were feeding strawberries to livestock due to lockdown, otherwise demand for such premium agriculture produce is very high in summer due to erratic supply chain [14]. Several farmers in Indian States especially Karnataka were faced trying times due to snapping of the supply chain that had forced them to dump their produce unable to find the means to transport them to the markets causing suicide by the farmers [15].

1.3 COVID-19 and Agriculture

The impact of COVID-19 had not only pause the global economy but, set the clock backwards on the developmental progress of several nations including India [16]. In India, during lockdown and unlock period, agriculture sector has been emerged as the only saviour giving hope for future and registered a 3.4% GDP (gross domestic product) growth [17]. The positive agricultural output is the only positive element in the GDP print. Thus, agriculture sector has beaten pandemic as per the latest GDP figures. The GDP segment of major sectors/industries during lockdown period has been given in Table 1.

The data in above Table 1 depicted that agricultural sector has stayed relatively unharmed during the lockdown [18]. Actually, in India, unemployment has rise and GDP projections have dropped sharply through the lockdown period. But, it appears the agriculture sector has emerged relatively unscathed. Analysis by Crisil (Credit Rating Information Services of India Limited) found that in financial year 2021, the sector could grow by 2.5% owing to diverse output of agricultural sector. The reason for better performance of agricultural sector as compared to other industries lays on the fact that agriculture sector has its diverse output. The overall output of agricultural sector comprises of production from crops, livestock, forestry as well as fishing. The above mentioned sub-groups or components of agriculture were impacted differently due to corona virus outbreak; however, overall the sector does not experience a major shock during the lockdown [18]. As per the Crisil report, horticulture and fishing sub-sectors were the most susceptible to risk during the lockdown, but food grain and livestock were relatively insulated from the pandemic [18]. Hence, the agriculture sector in lockdown remains protected owing to its diverse output. Moreover, the central as well as several state governments have acted very quickly and declared agricultural inputs as essential services and

provided exemption for manufacture and transportation of such inputs from lock down [19]. Food grains are also better protected by government measures like minimum support price and procurement assistance in *mandis* (grain markets) especially wheat. Likewise, in livestock sub-sector, though the demand had declined as a result of restaurant and hospitality industries slowing down, household demand remained stable. In order to lessen the impact of the lockdown on agricultural sector, various state governments have provided incentives to farmers to unlock growth [20]. Exemption from restrictions allowed farmers to harvest and transport food grains to *mandis*, while the Food Corporation of India (FCI) and the states carried out massive procurement in an extra ordinary situation [20]. Different states like UP, Telangana and Punjab among others have helped farmers to unlock agricultural growth amid the freeze. Beside above facts, increase in area under *kharif* cultivation, decline in fertilizer expenditure and borrowing compared to last year, etc. have been reported [21].

In the wake of COVID-19, the Government is making some policies and looking to strengthen and even strengthened the medical facilities in the country. Parallel to this, though the Government has also focused on agricultural sector and assisted procurement in *mandis*, provided incentives to the farmers and exempted restrictions on harvest and transportation facilities, but still there is a need to look at supporting and establishing digital platforms to scale up on an emergency basis and provide an outlet for the farmers' produce immediately [19]. The Government should take initiative to sell farmers commodities directly to consumers through online mode. Some of these platforms have been performing excellent in the last few years. However, they need a big push from the government in a crisis situation like COVID, so that they can provide new solutions to the farmers [19].

Moreover, there is also need to connect every farmer of India together to provide precise prediction of crop productivity and demands. As a long term measure, government should think to build storage facilities on villages' level, so that farmers may utilise such facilities in routine or especially in emergency situation. Encouraging investment in village level warehousing and purchasing agricultural produce directly from farmers or farmer producer organisations (FPOs) is a much needed reform [19], though the government is working on it and promoting FPOs by providing financial supports through NABARD (National Bank for Rural Agriculture and Development), etc. Initially, during COVID-19 outbreak, everyone was afraid of purchasing vegetables from outside market because of contagious infectious disease. So, it is advisable that farmers those having even small piece of land, need to grow at least their daily need vegetable as kitchen gardening. Further, more emphasize should be laid on processing and value addition of agricultural and livestock produce especially at small scale or domestic level so that post harvest losses may be avoided to some extent. Government support and policy reforms should be used for establishing more compact and efficient supply chains and attracting the business sector in agriculture [20]. States could also carry out reforms at the local level keeping in view the local or region specific need of the farmers to making them more comfortable to sell their produce. Many states have allowed FPOs to deliver horticultural produce directly from farm to fork [20].

Currently, India's policy regimes like the Minimum Support Price (MSP) and the Public Distribution Systems (PDS) are mainly skewed in favour of staple crops like rice and wheat. Thereby, in order to transform the food systems in India, government need to support pricing for other nutritious cereals like sorghum and millets

Table 1. GDP segment of major sectors/industries during lockdown period

Industry	April-June (2019-20)	April-June (2020-21)
Agriculture, forestry & fishing	3.0%	3.4%
Manufacturing	3.0%	-39.3%
Trade, hotel, transport, communication & services related to broadcasting	3.5%	-47.0%
Public administration, defence & other services	7.7%	-10.3%
Gross Value Added (GVA)	4.8%	-22.8%
Gross Domestic Product (GDP)	5.2%	-23.9%

(at Basic Prices in Q1 (April-June) of 2020-21)

(Source: Jaiswal, 2020)[17]

[22]. Some years ago, policy watchers have suggested crop diversification to correct such legacy incentives, which is not possible without the promise of a stable income from other crops. Thereby, farmers will make the transition only with suitable financial incentives, a strong value chain and new consumer behaviour. COVID-19 may have opened up an opportunity to effect these changes [22].

2. CONCLUSION

The COVID-19 besides rebooting the nature has exerted a significant negative impact on global economy. The agricultural sector has emerged as a positive element for GDP despite various challenges viz. labour shortage, transportation, marketing, etc. faced by this sector. To cope with the situations arose due to pandemic like COVID and ensure least impact on agricultural sector beside the favourable and supportive policies of the government, there is still need to support and promote digital platforms, warehousing or build storage facilities on village level, strengthening of processing and value addition, support pricing for other nutritious cereals like sorghum and millets, etc., Such steps and activities will definitely ensure least loss of the produce and income of the farming community.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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