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A Blueprint to Boost Indian Agriculture in the Era of Covid-19 Pandemic

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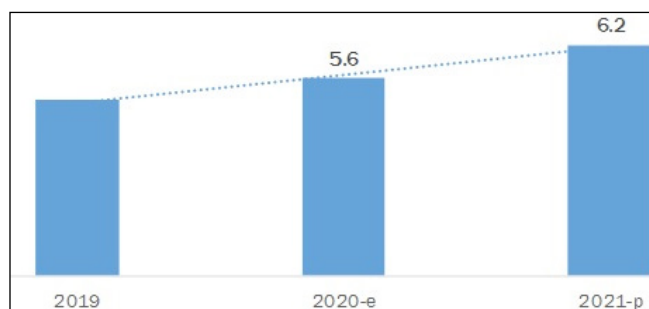
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Abstract

India, the second-most populous country in the world is under tremendous pressure. As the corona pandemic was leaving deep scars around the globe, India was able to foresee the depth of the socio-economic hit that could be caused shortly by the pandemic. Along with this existing backdrop of India, the sudden cease of economic activities nationwide will help in rising food insecurity and narrow down farmers' welfare. During these challenging times, the questions, how does Indian Agriculture respond to the crisis and how do government measures affect 140 million farm households across the country, are assessed the challenges that Covid-19 has posed to the farm sector and suggest mitigation measures to ensure a sustainable food system during this crisis and in the post-crisis era of the Covid-19 outbreak.

Introduction

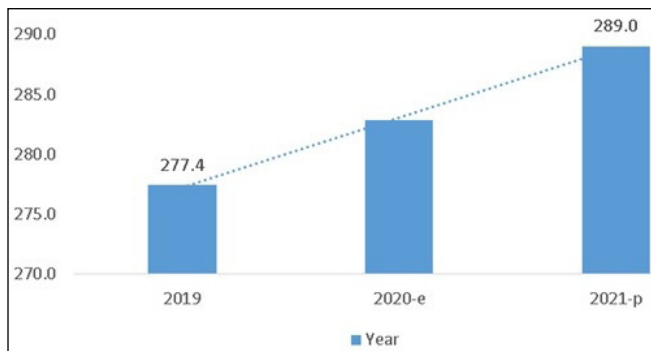
India has made impressive improvement on the agricultural sector during the last three decades. The credit goes to the small farming families who form the backbone of Indian agriculture and economy. Policy support, production strategies, public investment in infrastructure, research and extension for agricultural crops, livestock management and fisheries has significantly enhanced the food production and its availability in local market. Availability of food grains per person increased from 452 gm/capita/day to over 476 gm/capita/day, even as the country's population almost doubled. Future increases in the production of cereals and non-cereal agricultural products and commodities will have to be essentially achieved through increasing in crop productivity. Average yields of most crops in India are still rather low and should be enhanced during this Covid-19 pandemic crisis era. During the post COVID-19, the global digital agriculture market size is estimated to grow from USD 5.6 billion in 2020 and is projected to reach USD 6.2 billion by 2021, recording a CAGR of 9.9% (Figure 1).



(Source - <https://www.marketsandmarkets.com/Market-Reports/covid-19-impact-on-digital-agriculture-market-222616344.html>)

Figure 1: Covid-19 impact to the digital agriculture market (USD Billion)

The increase in demand for agricultural food products, shift in consumer preferences to higher standards of food safety and quality, and non-availability of labour during Covid-19 are some of the driving factors for the market. Post Covid-19, the global feed market size is estimated to grow from USD 282.8 billion in 2020 and projected to reach USD 289.0 billion by 2021, recording a CAGR of 2.2% (Figure 2). The increasing awareness about livestock nutrition, modernization of the livestock industry, and the rise in the consumption of meat & other livestock-based products have led to an increase in the market size of feed additives. However, due to Covid-19, feed manufacturers and producers are becoming more aware of techniques and strategies to cope up with the situation. This, in turn, is projected to lead to an increase in demand for feed additives, as the market growth starts stabilizing. To meet the projected demand in the year 2020, India must attain a per hectare yield of 2.7 tons for rice, 3.1 tons for wheat, 2.1 tons for maize, 1.3 tons for coarse cereals, 2.4 tons for cereal, 1.3 tons for pulses, 22.3 tons for potato, 25.7 for vegetables, and 24.1 tons for fruits. The production of livestock and poultry products must be improved 61% for milk, 76% for meat, 91% for fish, and 169% for eggs by the year 2020 over the base year TE 1999.



(Source - <https://www.marketsandmarkets.com/Market-Reports/impact-on-animal-feed-market-183883928.html>)

Figure 2: Covid-19 impact to feed market (USD Billion)

Impacts of Covid-19 on Indian Food Systems

Local food systems are fragile in a country like India. About 91 percent of the total workforce is from the informal sector, they include agricultural, migrant and other workers who entirely depend on daily wages as a mode of living. These vulnerable groups and their families will be the hardest hit during these unprecedented times. Even though the sudden imposition of the countrywide lockdown was a wise move to contain the spread of the corona virus, local food systems were disrupted. The worst part of the countrywide lockdown was that it coincided with the country's peak harvesting time of a variety of crops of the season. Summer vegetables and fruits were ripened and ready to pick; wheat,

paddy and barley crops were ready for harvest but all the farmers' hard work went to waste due to the sudden halt of the country. The bumper harvest of wheat in the northern part of India hobbled due to shortage of labour and transportation bottlenecks. The western city of Pune where they grew grapes in abundance had to seek for student volunteers to harvest their crops. The farmers were forced to sell their produce for a lower price as storage facilities were overflowing.

There was a huge post-harvest loss of vegetables and fish stock as a result of zero business. Hindrance of transportation and fear of vigilant checks at state borders made it even difficult for the sales to happen. Asia's largest onion trading market in Maharashtra found it difficult to transport the freshly harvested onion across the states as the panic mode prevailing in the country made the workers and drivers to flee to their homes. The poultry and meat industry were under immense loss due to the fake rumours of the association of Covid-19 and animals. The plummeting demand for meat and poultry resulted in an unimaginable plunge in their costs resulting in a loss of Rs. 22.5 million (USD 300 000) for the industry. In Haryana, the northern state near Delhi had a plentiful harvest of cucumbers and bell peppers but it began to get rotten as there was a sudden disappearance of buyers and retailers. Karnataka, the largest coffee-producing state in India was unable to sell coffee as there were no traders and workers. Tons of cured coffee worth USD 52 million was piled up in the warehouses due to the blockade in the supply chain.

Urban residents all over India found it difficult to buy groceries as the commodities became scarce in the beginning. The major reason was panic buying and hoarding among the people. Retailers took advantage of the lockdown situation by imposing exorbitant prices on existing stocks. Black marketers were on the rise that sold essential commodities at an outrageous price. There was a huge surge in demand for processed foods like instant noodles, biscuits and snacks. But in the meantime, all food processing activities virtually stopped. Major food processing companies like Nestle, Britannia, ITC, Parle and PepsiCo are running at low capacity as labours moved back to their villages. Shortage of raw materials also resulted in low production rate. Although the government gave repeated assurance through press conferences regarding food security - on the ground issues were different as mob rushed to stock up essentials.

Strategies to Boost Indian Agriculture in the Era of Covid-19 Pandemic

Increasing genetic yield potential of a large number of vegetables, fruits as well as other food crops, livestock and fisheries products and developing hybrid varieties as well as varieties suitable for export purposes are essentially needed. To address location specific problems crop husbandry and to carry out intense research on coarse grains, pulses and oil

seeds to achieve a greater yield, development of hybrid rice, single cross hybrids of maize, pigeon pea hybrids, soybean, sunflower and oil palm will help in meeting the food security and future oil demands successfully. Attention should be given to balanced use of nutrients. Phosphorus deficiency is now the most widespread soil fertility problem in both irrigated and unirrigated areas.

To improve efficiency of fertilizer use, use of micronutrient and soil amendments, improvement in soil testing services, development of improved fertilizer supply and distribution systems is needed. Agriculture is the biggest user of water. It is projected that availability of water for agricultural use in India may be reduced by 21 percent by 2020, resulting in drop of yields of irrigated crops, especially rice, thus price rise and withdrawal of food from poor masses. Watershed development is essentially needed for raising yields of rainfed crops and widening of seed revolution to cover oil seeds, pulses, fruits and vegetables. Farming system research to develop location specific technologies must be intensified in the rainfed areas. Strategy to make grey areas green will lead to second Green Revolution, which would demand three-pronged strategy i.e., watershed management, hybrid technology and small farm mechanisation. In the face of shrinking natural resources and ever-increasing demand for larger food and agricultural production arising due to high population and income growths, agricultural intensification is the main course of future growth of agriculture in the region.

Development of technologies that will facilitate agricultural diversification particularly towards intensive production of fruits, vegetables, flowers and other high value crops that are expected to increase income growth and generate effective demand for food. Post-harvest losses generally range from 5 to 10 percent for non-perishables and about 30 percent for perishables. This loss could be and must be minimized. Emphasis should therefore be placed to develop post-harvest handling, agro-processing and value-addition technologies not only to prevent the high losses, but also to improve quality through proper storage, packaging, handling and transport. Improvement in the agricultural export contribution of India is needed, which is proportionately extremely low. Cost-effectiveness in production and post-harvest handling through the application of latest technologies should be emphasized. Productivity increasing varieties of crops, breeds of livestock, strains of microbes and efficient packages of technologies, particularly those for land and water management, for obviating biotic, abiotic, socio-economic and environmental constraints should be checked and utilized. Yield increasing and environmentally-friendly production and post-harvest and value-addition technologies should be adapted. Reliable and timely availability of quality inputs at

reasonable prices, institutional and credit supports, especially for small-poor farmers, and support to land and water resources development should be ensured. Effective and credible technology, procurement, assessment and transfer and extension system involving appropriate linkages and partnerships; again, with an emphasis on reaching the small farmers are highly needed.

Particular attentions to the needs and primary education, health care, clean drinking water, safe sanitation, adequate nutrition, particularly for children and women should be given preferences for enhancement. Contributions of small holders in securing food for growing population have increased considerably even though they are most insecure and vulnerable group in the society. The frequency and intensity of disasters such as floods, droughts, cyclones and have increased in the recent years. Special effort should be made to develop appropriate technologies for increasing preparedness to predict and to manage the disasters. Effective and reliable information and communication systems, contingency planning and national and international mobilization of technologies and resources are a must.

Conclusion

Overall, the Covid-19 pandemic is a crucial juncture in the Indian history. The evident trails from the rest of the world were helpful for the Indian officials to take preparedness and response measures at the right time to tackle the pandemic. The bold and decisive leadership of the central, as well as the state governments has implemented remarkable strategies to protect the livelihood of millions. Along with the government, giant corporates and NGO's are in the frontline to make consensus to curb the spread of the virus. Undoubtedly, each Indian has taken the "break the chain" slogan to their minds by staying home for a promising future ahead for the entire world. Evidently, the Indian government has taken huge steps to feed the entire nation and protect their lives and livelihoods amid the corona virus outbreak. Hoping that this cloud also has a silver lining, in reshaping the society's potential for greater food security and food sovereignty, thus paving the way to efficient food systems.

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