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Impact of COVID-19 on agriculture and food security in India: A review

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Abstract

The COVID-19 pandemic is a wellbeing and human emergency undermining the food security and nourishment of a huge number of individuals around the globe. A huge number of individuals were at that point experiencing yearning and hunger before the infection hit and, except if quick move is made, we could see a worldwide food crisis. The COVID-19 pandemic likewise raises the caution on the earnest need to change the world's food frameworks. Around the world, food frameworks stay a driver of environmental change and the planet's unfurling natural emergency. This emergency can fill in as a defining moment to rebalance and change our food frameworks, making them more comprehensive, manageable and versatile. As per the International Labor Organization (ILO), the ascent in joblessness as a result of Covid-19 could be up to 25 million around the world. On the off chance that the lockdown proceeds past further, the effect is probably going to be significantly more serious on the working individuals and on the economy all in all. Numerous atmosphere models anticipate an ideal storm in the 2020 season (the India Meteorological Department has additionally since formally reported) as the El-Nino climate wonder, that upsets precipitation in India, isn't apparent. This is without a doubt an uplifting news in the COVID situation, accepting farming can rehearse to a great extent solid. Uplifting news is that Government of India has now expanded its attention on sustenance (other than food)- security and raising ranchers' salary (as opposed to improving homestead profitability). Changing the buyer conduct with appropriate projects and motivations is as of now in the plan. For all these to occur, the current scene of strategy impetuses that favor the two major staples of wheat and rice needs to change. Planning farming arrangements, post-COVID19 situation, must incorporate these goals for a food frameworks change in India.

Keywords: Agriculture, COVID-19, food security, impact

Introduction

The world humanity has already experienced different pandemics which had a great impact on human activities like agriculture, travelling, transportation, learning, fitness, fishing, excavating, business etc. and also effected the economy and the environment (Raul Siche, 2020) Currently, another new infection coronavirus (2019) which causes the disease known as COVID-19 is effecting the humanity (Wang, 2020) ^[46]. This pandemic has caused serious human health issues around the globe. Immediate measures to combat the virus effects such as restriction on movement, transport and quarantines are taken, which will remain in strict implementation with uncertain end dates. (Stephens, 2020) ^[41] these restriction has caused economic shocks also effecting agricultural activities and food systems internationally. Even now, we are facing the indirect effects of the covid-19 on the agricultural systems in the whole world (Indarnil *et al.*, 2020). The disease COVID-19 is spreading continuously and causing hard times to the humanity and has postured serious problems for the effective and sustainable working of agricultural and food markets around the world. (Attila *et al.*, 2020) ^[3]. As of September 2020, 18,86,643 new COVID-19 cases and 37,559 new deaths. This carries the collective total to 2,67,63,217 confirmed COVID-19 cases with 8,76,616 deaths (WHO, 2020) ^[49]. The WHO is still recording a constant rise in the number of cases across the world. With the increasing growth of the infectious disease, there is also an increase in hunger and malnutrition (Sar *et al.*, 2010) ^[35]. As the situation worsens making movement restrictions more and more stringent. Agriculture which is the most important sectors related to food security human development (Abdelhedi and Zouari, 2020) ^[1]. Quarantine procedures taken are rigorously affecting labour availability for major agricultural practices which include from sowing the crops to picking fruit (Stephens *et al.*, 2020) ^[41]. As this crisis develops, the impacts are more likely and deeply felt in agricultural sectors (Kogo *et al.*, 2020) ^[19]. Although there are no reports on the level of impact of the virus on agriculture sector. There is a need to

understand and estimate the immediate consequences of Covid on the universallinkage of agricultural and food systems and should be able to track unexpected risks, Also understand short-term and longterm effects and need to plan substantial short- and long-term measures.

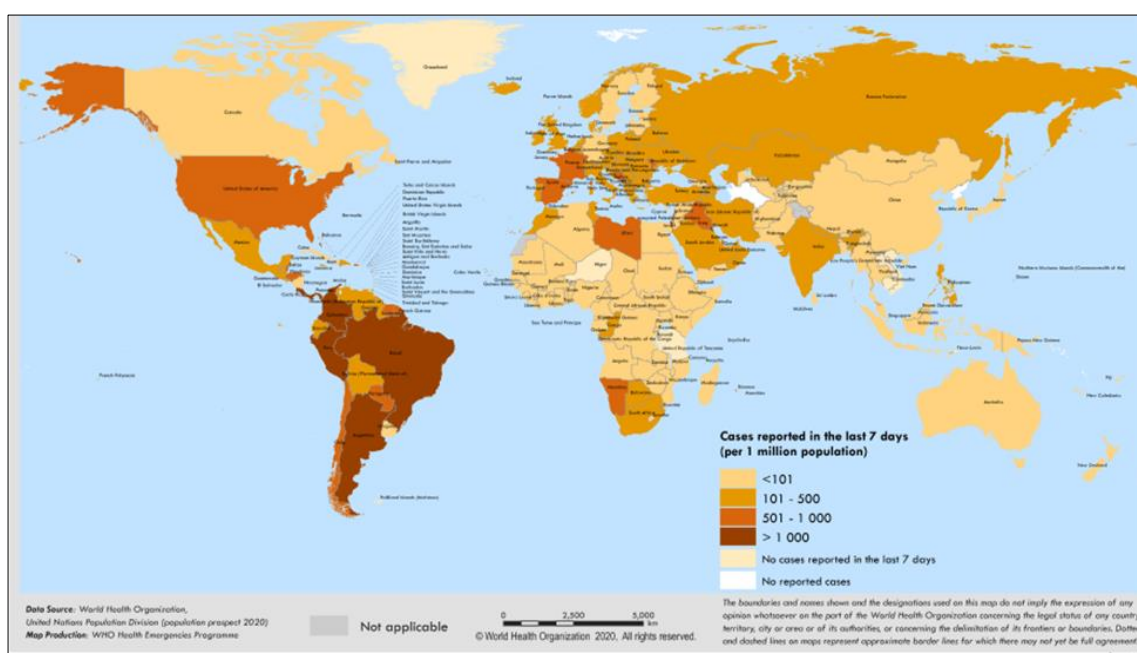
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Effect of Covid-19 on humanity

The new virus and disease were not known till December 2019 until the outburstcommenced in Wuhan, China. COVID-19 is now affecting various nations internationally. In India by the start of September 2020, 5,71,078 new COVID-19 cases and 7128 new deaths. This carries the collective total to 41,13,811 million confirmed COVID-19 cases with 70626 deaths (WHO,2020) [49]. Coronaviruses are a family of viruses which cause sickness in individuals which belong to the sub family Orthocoronavirinae under the family Corona viridae inside the order Nidovirales, and are categorized into four genera: Alpha-coronaviruses (α), Beta-coronaviruses (β),

Gamma-coronaviruses (γ), and Delta-coronaviruses (δ). Usually, CoV infect humans and variety of avian and mammalian species worldwide [Fung TS, 2014] [14]. Coronaviruses are identified to cause lung infections extending from the common cold to problematic diseases for example Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS).

Fever, dry cough, and tiredness are the very common signs of COVID-19. Other less common and mild symptoms also include body pains, nasal congestion, headache, conjunctivitis, sore esophagus, diarrhea, lose the sensitivity of taste buds or odor or a rash on skin. Some persons become diseased but only have very minorindications (WHO, 2020) [49]. Severe and fatal kind of pneumonia and bronchiolitis especially in adult, children and immunological weak patients as well. Actually, target site of this virus was respiratory and enteric tracts of both animal and human (Fung, 2014 and Liao, 2013) [14, 22]. Historically, it was proved the CoV infection in humans have been related with slight upper respiratory tract sites (Siu, 2014) [40]. In serious cases; infection can cause pneumonia, severe acute respiratory syndrome, kidney failure and death (Ben, 2013).About 80% of infected people get well from the infection without hospital treatment. Out of every 5 people around 1 found very ill and facing difficulty in breathing (WHO, 2020) [49]. Older persons, and people having serious medical problems are at greater risk of facingsevereweakness (Rao *et al.*, 2020) [32]. The period between introduction to COVID-19 and the development of symptoms usually takes about five to six days and can range from 1 – 14 days.



(Source: WHO, 2020 health report)

Fig 1: Number of confirmed COVID-19 cases recorded till end of august by countries

Preventive Measures- Middle-East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) are type of coronavirus transmitted human to human through droplets, contact (Kumar, 2009) [21]. To diminish the wide-ranging jeopardy of spread of acute respiratory infections, to stopthe spreading of infection,we need to wash hands frequently, covering mouth when coughing and sneezing, thorough cooking of meat, avoiding vulnerable interaction with animals along with improving the healthcare services in

emerging sectors. (Rao *et al.*, 2020) [32]. If any symptoms of respiratory illness appeared during or after the travel, traveler pursues the consultation from the medical experts (Brown, 2011) [6].

Lockdown effect on Climate Change

In practice, lockdown,it means all the economic activities are shut down, which in turn, means, that the production and supply of goods and services are disrupted, if not halted.

(Ramakumar, 2020) [31]. India is severely hit by the outbreak of COVID 19. Govt. of India decided to resort to an unprecedented 21 days (March 25 to April 14) national lockdown i.e., a state of isolation and restricted access instituted as a security measure of the entire country. Due to this, a huge reduction in the concentration of pollutant in the air observed within a week resulting environment become pollution free in most of the metropolitan cities in India. Hence, we can say, lock-down is effective to control air pollution (Mahato *et al.*, 2020) [23]. According to the environment performance index, Delhi is declared the most polluted megacities of India (WHO, 2016) [47]. As per the environmental observing record, WHO declare the major leading megacities of the world covering 100 different countries issued in April, 2018 in which Delhi is the most polluting city with high PM10 pollution (WHO, 2018) [48]. In NCT Delhi, PM2.5 concentration is noted extremely high from the last few years and it is more than the permissible limits according to the National Ambient Air Quality Standards (NAAQS) (Mohan and Kandya, 2007) [25] (Kumar *et al.*, 2017) [20]. This high intensity of polluting air causes substantial communal health issues (Heal *et al.*, 2012) [16] (Dholakia *et al.*, 2013) [10] viz., breathing problems, lung discrepancy, pneumonia, severe asthma etc. (Rizwan *et al.*, 2013) [34]. Because of the infection of novel Corona Virus, a countrywide lock-down is enacted as a result of these nearly all business and trade events, conveyance, transport and shipping activities have been restricted. Therefore, approximately 88 cities become pollution free in India (Sharma *et al.*, 2020) [38]. To define the extent of polluting air of a particular city, Air Quality Index (AQI) or Air Pollution Index (API) is generally used (Shenfeld, 1970) [39] (Thom and Ott, 1975) [45] (Ott and Thorn, 1976) [28] (Murena, 2004) [27].

The COVID-19 contagion has directed to an abrupt drop of GHG emissions resulting 30% decrease in CO₂ and NO_x emissions has been observed in April 2020. (Forster, 2020) [13]. Hence, the reduction in pollutant concentration of the air is due to lock down and it is also marked in all over the world. (Mahato *et al.*, 2020) [23]. Because of the decreased contamination in water, the Dolphins of South Asian River have been observed at different Ganga Ghats of Kolkata. The water quality of river Ganga improved remarkably, the pure and pollutant free water is an outcome of the closure of most of the manufacturing units. The 2,500 km extended stream has been an essential portion of India's history, individuality, spiritual philosophies and economy for so many years. Photographs of a cleaned River Ganga have been taken from Kanpur and Varanasi of Uttar Pradesh. The testing grades of the water purity of river Ganga are anticipated. According to the specialists the lockdown, low crowd and pollution are responsible for lesser contamination in water. While in the southeast Delhi's Kalindi Kunj, the River water of Yamuna is getting purer day by day due to reduction in release of sewage-sludge water, industrial effluents, domestic water and other chemicals from manufacturing left-over which reduces the toxic concentration in river water. (Sukirti Dwivedi, 2020) [42]. The river water of Har-ki-Pauri in Haridwar (Uttarakhand) was tested by Pollution Control board and the results declared that this water is 'suitable for intake after chlorination for the very first time in history.

Impact on Agriculture activities

The lockdown at the back of COVID-19 has interrupted all commercial events and happenings. This lockdown is the essential step to fight against the disease but has distressed agriculture, which is the mainstay of about 55% of 1300 million population of the country which *subsidizes around 17 per cent to Indian GDP* (Brahmane *et al.*, 2020) [5]. Luckily, the spreading of contagion is not very fast in India because the government have been taken appropriate and timely measures to control this pandemic, but the effect of COVID-19 drastically affect the monetary conditions. (Jhahria *et al.*, 2020) [18].

COVID-19 has its effects on agriculture and supply chains activities. The lockdown period is the peak of *rabi* and crops like wheat, chickpea, barley, field pea, oat etc. were ready to harvest or almost reaching maturity and then the field harvests sell in mandis for certain earning maneuvers by elected government organizations but lockdown resulted in Peak harvest time with no procurement. The early information revealed that the migration of labor and unavailability during the peak period interrupted some harvesting events, predominantly for cereals and legumes in northwest India. (Mahender Dev, 2020). It is not so true that the harvesting processes severely disturbed by the lockdown because most of the farmers harvested their crop without any unease. In the earlier months around 10% of farmers did not harvest their produce and 60% of the farmer who harvested faced a severe yield reduction. (Seema, 2020) [36]. Here is a chance of labour inadequacy, mainly in the north-west India, where field activities are completed by making a contract between farmers and labour servicers. Though, there are two reasons that claimed harvesting of crops shall not be interfered. First, the labour is migrating from cities to their villages and now their earnings totally depends on agriculture. Although there is inadequacy of labours, their scarcity is fulfilled by the member of farmer's family (Jhahria *et al.*, 2020) [18]. Due to the lockdown, harvesting of wheat crop in all over the country is going to be affected as most of the crops are in maturity stage. However, only about 40% of the wheat could be harvested so far. Even the very late sown wheat is now almost ready for harvest. Post-Covid19 lockdown restrictions have delayed the harvest due to lack of labour availability and movements of combines. (Brahmane *et al.*, 2020) [5].

Due to the lockdown, one more problem is arises is the marketing/selling of farm products. The Government has taken certain measures to overcome this problem, but there is no sufficient buyer in the market and there are facing transport unavailability. The lack of transport services along with cautious blocking highways encouraging the migration of harvest labour and agri-machineries disrupted the supply chain. Up to an extent it is due to unavailability of customers and mainly because of market insecurity and propagandas. (Jhahria *et al.*, 2020) [18]. In the metros, the market prices of grain crops and edible oil increased by 10% (moderate) and for legumes, by 10-20%. There was 30% or more increment in price have been observed in potato specifically in Chennai, Kolkata and Delhi. (Table 1). Some price fluctuations also occurred in other vegetables. The increment in price is occurred due to the disturbance of supply chains and largely, the price fluctuation is a result of the off-season for some vegetables i.e. tomato. (Jhahria *et al.*, 2020) [18]

Table 1: Percentage change (%) in the prices of necessary food stuffs in the postlockdown over the pre-lockdown period

Centre	Prices	Wheat	Wheat flour	Gram dal	Tur dal	Groundnut oil	Potato	Onion
Chennai	Wholesale	5.0	0.0	10.8	15.1	-	29.6	-0.2
Chennai	Retail	6.1	0.0	10.3	8.8	4.8	30.0	10.0
Delhi	Wholesale	0.0	2.9	0.7	8.6	0.0	10.4	-27.0
Delhi	Retail	0.0	6.5	13.2	2.4	5.6	14.1	-0.4
Kolkata	Wholesale	-	5.7	11.0	2.1	0.7	36.9	0.0
Kolkata	Retail	-	9.6	9.2	2.3	0.8	30.8	0.0
Mumbai	Wholesale	-4.0	0.0	16.7	13.7	1.7	10.5	-13.4
Mumbai	Retail	0.0	-2.4	18.3	12.9	4.3	20.3	13.2

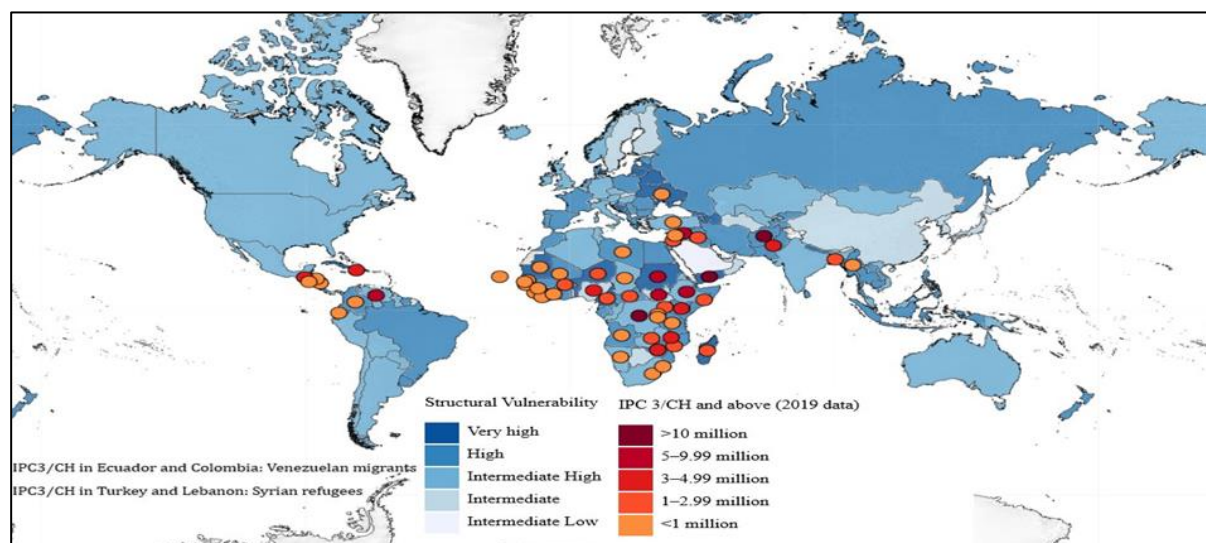
Note: change in Post-Lockdown Week 3 (5-11 April, 2020) over Pre-Lockdown Week (15-21 March, 2020). Wholesale: Wholesale price.

Impact on Food Security

The COVID-19 pandemic is intimidating the extended-valued food safety in India (FSI). It affected all four facets, namely 'accessibility, exploitation, steadiness, and consumption' of food (Suresh Kumar, 2020) [19]. There are thousands of people already facing food shortage and starvation before Covid-19 and, unless instant measures is applied, we could face a worldwide food crisis. (UNSDG, 2020). This pandemic came when already people suffering from malnutrition or starvation. Recently, as per the UN estimation, declared that the economy of the country severely threatened by this pandemic due to this on an average 83 million to 132 million people may face hunger in 2020 (FAO, 2020) [11]. The collective effects of COVID-19 itself, timely taken governmental interventions and the mitigation measures, without significant synchronized, interrupt the working of food organizations. Such interference can cause severe outlays for fitness and nourishment which generally has not been observed from the last few decades (UNSDG, 2020) [50]. The Prime Minister of India (Narendra Modi), on 24 March 2020, prolonged the single day "people's curfew" to a 21 days lockdown. Which means a total Indian population restricted to stay at their home only? India's whole financial doings was at a risk and farming sector is severely affected. This severity has been occurred specially in Punjab for rice in which subsidized industrial farming is heavily used. (CGIAR, 2020) [7]. Covid-19 doesn't show any significant effect on food availability. Till March 1, 2020, India had sufficient food grains stocks: 58.4 million tons and pulses 3 million tons. But, it is not true for other supplies such as fruits

and vegetables, eggs, meat, milk, and sugar that comprises 78 percent of the total food utilization. Reduction in demands and breaking the supply chain had triggered a huge loss in production and earnings of the farmers, dealers, and customers (Suresh Kumar, 2020) [19]. Already the production fruits and vegetables is declined, and due to shutdown, it is also not perceptible which ultimately intercept the food supply chain in countries already facing other calamities, FAO did a survey at grass root level and stated that the small-marginal farmers are facing problems to purchase basic inputs – such as seeds and fertilizers – due to high cost of these inputs, resulting a drastic reduction in domestic returns (FAO, 2020) [11]. Furthermore, these novel corona virus attack occur when our country already suffering from food safety and food shortage. Clash, natural calamity, alterations in climate and the attack of insects and pandemics on a pancontinental scale headed COVID-19 and even now decline in food safety in various perspectives. For instance, in East Africa, the population are menacing "triple threat" of equally aggravating tragedies, as continuing heavy precipitation hinders efforts to treat locust attack in the middle of these pandemic outburst. In the meantime, the nastiest locust emergency in periods severely affect the crops at the time of its maturity (UNSDG, 2020) [50]

On-going and increasing supplies of agricultural inputs (implementing tools, sowing material, fertilisers, animal feed) and facility of lives to check fitness helps to confirm nonstop food making and earning options in many of the susceptible areas. (Food & Agriculture Organisation, UN, 2020)



Source: FAO/Hand-in-Hand, IPC info

Fig 2: Structural vulnerability and known food insecurity hotspot

Challenges faced due to Covid-19 in Agriculture

The COVID-19 virus is responsible for a universal health hazard and even now it is having shocking effects on the

global economy by directly and indirectly by taking essential measures to control the spread of the virus. (OECD, 2020) [29]. There are surveys had been taken to assess the effect of the national lockdown in contradiction of COVID-19 on agricultural & allied sectors as well as living of people. According to the survey, approximately 40 per cent farmers face yield losses is due to unavailability of labour, lack of transport facilities and shortage of storage. (ShagunKapil, 2020) [37]. The lockdown results lack offarminglabours as lots of are afraid to leave their families and villages to go to work. Due to the present lacking, the next upcoming weeks are likely to notice a rise in the demand for worker and the wage amount. (Prasenjit Barik, 2020) [30]. Due to the inaccessibility of the input materials for eg. Hoes and tractor for field preparation, seeds, fertilisers, labours, pesticides etc, responsible for late sowing and harvesting of crops, this is the very first shortcoming observed because of this pandemic. However, this is prime time for agricultural sectors to sell their products which is used in agricultural operations. The e-commerce brands in agriculture also affected due to the fail of conveyance of these products and they faces loss in monetary returns (Tauseef Khan, 2020) [44]. During the lockdown period, almost 63 per cent of farmer harvest their crops out of which, 22 per cent farmer obligated to stock their produce because of shutdown associated problems. About 12 per cent farmers tried to market their produce, but only 44 per cent of farmers succeeded to sell their crops (Shagun Kapil, 2020) [37]. The second evident effect of COVID-19 is disturbance in supply of agricultural commodities in the rural areas. Some of the transporters received permission from the government to transport foodstuffs, vegetables, fruits, groceries and cereals, and facilitated home deliveries via truck, and some conveyers fails to grant permission (OECD, 2020) [29]. This formalities took extended time for the transport of harvest to reach the market for sell. Instead of these, restaurants are restricted to remain unopened, reduces the demand of food stuffs from the farmers resulting many farmers of different states facing substantial losses in earnings (Mahendra dev, 2020) [24]. According to a published report, the ministry of railway advises that shipping filling has reduced from a normal 10,000 freight rakes per day to only 3,000-4,000 now. Therefore, the farmers forced to market his produces at very low price and generate very low

profit (Tauseef Khan, 2020) [44]. The major and drastic effect of this pandemic is on food provision manufacturing industry, Leaders noticed, most of the hired employers lost their jobs till date. (Monica Jimenez, 2020) [26]. The third most important effect of COVID-19 is the loss of employment in the agricultural sector. During the lockdown period most of the agricultural activities got disturbed and restricted due to labour shortage, transportation, lack of storage etc affects the employment in agriculture sector (Ananth, 2020) [20]. But government provide assistance to farmers to compensate their losses in allied activities (Tauseef Khan, 2020) [44]. When PM Modi Ji, announced nationwide lockdown in March, the automatic reaction was a huge departure of migrant labour return to their homes, as labours encouraged to wait out the lockdown while at home (Consultancy.asia, 2020) [9].

The fourth drastic effect have been noticed in exports of products during complete lockdown. India is the major exporting country of the produce and according to APEDA, the agriculture product exported from India in 2018-19 was valued ₹ 685 billion but due to this pandemic the share of India in export severely slowed down(Tauseef Khan, 2020) [44]. The fifth and larger effect was seen on the MSME & SME's. These are mainly small and marginal manufacturing units, companies/brokers, and factories in which most of the employers seeks their jobs. The price of agricultural commodities have shrunken because of collapse of market with restricted transport facilities and shutting of state boundaries. (Civildaily, 2020) [8]. Post lockdown, their business is in danger and facing a drastic loss in income. The companies have no option, finally they started to hiring out their employees. Now People started to lose employment without having any idea of when the condition is being normal (Tauseef Khan, 2020) [44]. The 6th effect is the expectation of a frail utilization pattern post COVID-19. When things getting back to business as usual, the essential focal point of individuals is secure positions and get their organizations moving. During such time the two families and organizations will keep severe minds their spending designs. This pattern will likewise be an obstacle to the extension plans of the worldwide/public brands companies in this area. They will take some time before reevaluating their entrance to this market (Tauseef Khan, 2020) [44].

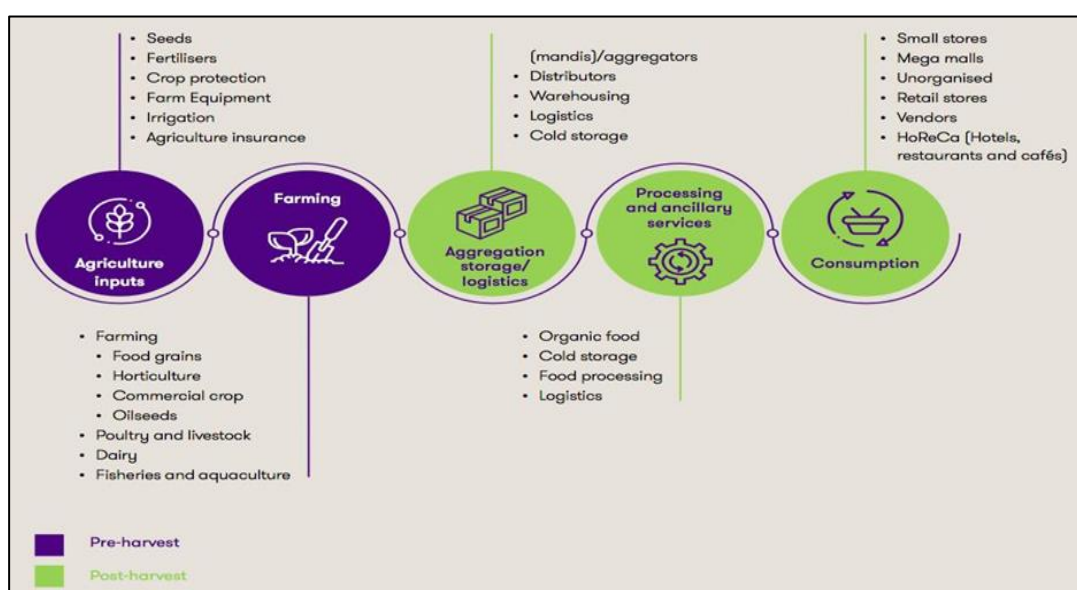


Fig 3: Covid-19 impact on agricultural value chain: Short to medium term

Though the pandemic has tried to bring the country down, India is smartly trying to search for opportunities from the problem itself. To overcome these testing times and to safeguard every sphere of the economy from demand to supply to manufacturing goods. Honourable PM Shri Narendra Modi has launched “*Atma Nirbhar Bharat Abhiyan*” that stimulates local economy. In order to bring the economy back on track, a comprehensive package of ₹20 lakh crore that accounts for 10% of India’s GDP has been pronounced. With more focus on local manufacturers and service providers to make the nation self-reliant is the focal point of this concept, the package will focus mainly on land, liquidity labour, and laws.

Why is Aatmanirbharta in agriculture necessary?

Investments in agriculture are the best weapons against hunger and poverty. In a large country like India, with a population of 1.37 billion, we can’t be in a “ship to mouth” situation and much of the food has to be produced at home. The importance of self-reliance was seen in the self sufficiency for cereals, the lack of which would have exasperated the current crisis. India is a multiproduct agricultural powerhouse. Ever since the economic reforms began in 1991, India has been a net exporter of agricultural produce with foreign exchange reserves of more than \$500 billion today. Contrary to the public perception, India holds a higher global rank of 2nd in agricultural sector where as in Industry and service sector it ranks 5th and 9th respectively. Indian agriculture like its culture is highly diverse creating an ample scope to contribute to the development of the country in all facets

Stimulus Package for Agriculture and Allied activities

Keeping in view the potential of agriculture in uplifting the country’s economy a fund of ₹ 1.5 lakh Cr was allotted to the primary sector under the following heads

Liquidity measures

- Funds worth ₹ 1 lakh crore has been given to farming cooperative societies, farmer producer groups and start-ups for boosting farm-gate infrastructure
- ₹ 10,000 crore has been allotted for Formalization of Micro Food Enterprises and cluster based approach is to be followed. The scheme supports the visualization “*Vocal for local with global outreach*”.
- Under PM Matsya Sampada Yojana fishermen were allocated ₹ 20,000 crore to pave way for 70 lakh tones of extra fish production of over 5 years and service to over ₹ 55 lakh.
- ₹ 13,000 crore has been allotted to achieve 100% vaccination of cattle, buffalos, sheep and pigs.
- ₹ 15,000 crore has been granted for animal husbandry infrastructure.
- ₹ 4,000 crore has been allotted for promotion of herbal cultivation which aims to cover 10 lakh hectares under herbal cultivation in 2 years.
- Bee keeping initiatives have been assigned ₹ 500 crore.
- ₹ 500 crore has been allotted for Operation Green to prevent wastage of agricultural produce.

Governance reforms

- Corrections to Essential commodities act to facilitate better price understanding for farmers under which cereals, edible oils, oil seeds, pulses, onions and potato are to be liberalized.

- Agriculture Marketing Reforms to offer marketing selections to farmers.
- Agriculture produce price and quality assurance.

What are the other decisions made?

1. Additional Emergency Working Capital of ₹ 30,000 crore for farmers through NABARD

₹ 30,000 crore re-finance support over and above the ₹ 90,000 for meeting crop loan requirement of Rural Cooperative Banks and RRBs, being provided by NABARD and Will profit 3 crore small and marginal farmers,.

2. ₹ 2 lakh crore credit boost under Kisan Credit Card Scheme

A special scheme to offer concessional credit to PM-KISAN receivers including Fisherman and Animal Husbandry Farmers through Kisan Credit Cards. Will give additional credit of ₹2 lakh crore and benefit around 2.5 crore farmers.

3. During lockdown period amount of ₹ 74,300 crores utilized for Minimum Support Price (MSP) purchases

4. PM KISAN fund Transfer of ₹ 18,700 crores

5. PM FasalBimaYojana claim payment of ₹ 6,400 crores

Conclusion

In this global pandemic, next to saving life is the necessity of having food to survive. It is marked that the pandemic COVID-19 twisted the world upside down, together with agriculture. Ample of work is now required from many experts or researchers functioning in different fields to analyze the effects. India being primarily an agricultural country has a potential to revive its economy starting from agriculture itself. Since India believes in ‘*Vasudhaiva Kutumbam*’, by becoming self-reliant and self-sufficient in agriculture it should also be able to feed its world family and contribute its part in making the world Hunger free in the near future.

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