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Kumari Nandita

Department of Horticulture
Fruit & Fruit Technology, Bihar
Agricultural University, Sabour,
Bhagalpur, Bihar, India

Manoj Kundu

Department of Horticulture
Fruit & Fruit Technology, Bihar
Agricultural University, Sabour,
Bhagalpur, Bihar, India

Priyanka Kumari

Department of Genetics and
Plant Breeding, Birsa
Agricultural University, Kanke,
Ranchi, Jharkhand, India

Farhana Khatoon

Department of Horticulture
Fruit & Fruit Technology, Bihar
Agricultural University, Sabour,
Bhagalpur, Bihar, India

Corresponding Author:**Kumari Nandita**

Department of Horticulture
Fruit & Fruit Technology, Bihar
Agricultural University, Sabour,
Bhagalpur, Bihar, India

*International Journal of Chemical Studies***Coping with Indian agriculture in pandemic****Kumari Nandita, Manoj Kundu, Priyanka Kumari and Farhana Khatoon**DOI: <https://doi.org/10.22271/chemi.2020.v8.i3aj.9594>**Abstract**

The impact on the Indian economy due to novel coronavirus pandemic in 2019-20 has been highly troublesome and disruptive. In spite of all the precautionary measures and numerous restrictions (i.e. ongoing lockdown) taken by the government of India, negative implications have been visualized on the farm economy especially the rabi season crops which are at harvestable stages. It makes the supply of different perishable produce including fruits, vegetables, dairy products, fish etc difficult. It also disturbed the labour availability, market and storage, agri-input system, export-import of agricultural commodities and the complex network of demand-supply chain to a majestic level. Although the entire country facing these challenges, but has double hit the poorest of the poor section of the society. Hence, the priority of the government has to be to protect the lives of every citizen of the country instead of dealing with the economic growth of various departments or fields.

Keywords: Agriculture, corona virus, COVID 19, lockdown, labour**Introduction**

Presently, the entire world is witnessing severe epidemics in 215 countries with 5,939,234 confirmed cases and 367,255 deaths of people worldwide^[1]. Currently, humanitarian crisis is also unfolding in India, with 89,995 active cases and 5,164 deaths due to global COVID-19^[2]. Increasing death tolls are alarming globally. In this situation of novel coronavirus pandemic, world is battling with the most daunting challenges faced by the human civilization. Contagious nature of this disease has led to imposition of policy actions such as social distancing, self-isolation at home, closure of institutions, restrictions on mobility and public facilities and lockdown of an entire country. This pandemic has imposed a major shock—health shock and economic shock. As the global economy is slipping into a sharp recession, it will also impact the Indian economy. The International Monetary Fund in March stated that it is expected to have a global recession that would be similar to 2007-08 global financial crisis which could be recovered in 2021^[3]. Not a single sector is going to remain untouched or unaltered by the novel COVID-19 pandemic. Similarly, this catastrophe has also led to concern on agriculture and food security. Its impact on agriculture is too complex and varied among different regions, producers and wage labourers as it is a highly heterogeneous and seasonal activity based. Thus “one size fits all” approach will not be sufficient to retain the wheel of agriculture in active mode. More than half of India’s work force is engaged in farming, while being the backbone of any country’s growth, agriculture contributes about 16 per cent to India’s GDP^[4]. India is one among the world’s largest producers of crops like wheat, rice, sugarcane, cotton, vegetables and milk. So there is no concern of stopping farm activity as it will not only hurt farmers and labourers but also affect food security.

Presently, agricultural sector contributes 16.5 percent of GVA and 43 per cent of Indian employment (2019-20). Market size of Food and Retail Market is 828.92 billion USD (2020) and Food Processing is 543 billion USD (2020). Major processed food segments are dairy (29 per cent), edible oil (32 per cent), cereals (10 per cent). Whereas, FDI equity inflow in food processing sector is 2.14 per cent of total FDI for the period of December 2019 to April 2020. Global presence of India holds 1st position in dairy, spices and cashew and while second position in food grains, fruits and vegetables^[5]. However, Food and Agriculture Organization (FAO) warned for “food crisis” if vulnerable people are not protected from hunger and malnourishment. In such a case where farmers are in incarceration to their work, where they are unable to work on their land, earn prices and access to market certain questions arise like— do

we have enough food to feed the people? Is food available at affordable price? And how are farmers coping up with this lockdown?

Bringing the economy back on track, both health as well as economic well-being must be kept in mind so that a systematic, careful and safe direction must be opted. In such case, decree to permit the “essential” and curtail the “non-essential” items’ movement became the excuse for the police and regulatory authorities to restrain on all transport in the country. Instead of specifying that all food and medical products should be allowed to move freely, the vague terminology of “essential supplies” is used which effectively stopped transport of all goods. Many such factors have been in present scenario resulting impact on agriculture.

Impact on Agriculture

1. Labour Availability: At this point of time, there is a shortage of labour in the rural areas to undertake harvesting of rabi crops and sowing for kharif by next month. Thus, farmers are unable to harvest and market rabi crop, fruit and vegetables. States like Punjab and Haryana are suffering the most due to shortage of labours as they are vital assets for packing, processing, transporting and selling the produce. One of the solution to overcome this situation is likely to change the cropping pattern. Farmers could move from labour intensive cropping pattern like paddy to cotton or maize. The second solution to this could be raise of pay to lure the workers. And the third supplement could be by volunteers from factory workers, unemployed local section and students. A faster shift to mechanisation of farming could be medium term consequence of pandemic.

On the other hand, this sector (labour) is unable to earn due to movement restrictions and lack of adequate income source. This outbreak has jeopardised all economic activity and disproportionately affected employment and daily wage earner in both rural and urban sector. After lifting lockdown, arrivals of large scale of labours are very likely to be seen in the entire nation. This may lead to sudden slowdown of wholesale prices because of excess supply, which may adversely affect the farming community again. Although now with limited intra state movement those with Covid symptom free are allowed to migrate, resulting in removal of shortage of manpower. Such period could also witness sudden increase in labour supply due to easing of mobility pushing down wage rates.

2. Market and Storage: Indian agriculture is currently in piquant situation as the peak farm activity happens between April to June. This is when winter crops are harvested and sold and sowing of summer rainfed crop starts. But in states like Maharashtra which are worst affected by COVID19 has already shut down a few large mandis. This mandis are confined spaces for thousands of farmers, traders and buyers, labourers and transporters, officials and others together and facilitate auctions daily, loading and unloading, packing, quality checking, etc. are performed. Agriculture markets are the very antithesis of social distancing. It is thus natural to foresee significant disruption in the supply chain if these markets are required to be shut for longer period of time. Lockdown has hit both the season. A majority of farmers have limited or no storage capacity to hold produce after harvesting. Further, they are unable to use cold storages of others on payment basis as most of the cold storages of entire nation remain closed due to short supply of ammonia during this lockdown period. Therefore, crops wasting on the field,

local distress sales and lower food prices soared in the aftermath of pandemic. However, farmers have hasty needs for liquidity to repay loans and sustain personal expenses, repair equipments and buy input for the next season. Thus it is not affordable to pause or delay the rabi marketing cycle, which typically starts in the middle of march and extends until the end of June.

Few approach can be adopted to address this challenge. First and most important step could be to suspend all provisions of APMC law for periods of at least six months. Lawful monopoly of APMC compels farmers to bring their produce to mandi and sell to a small number of licensed traders within mandi. As mandis may be shut, their so called monopoly would be worthless. So the law giving exclusive rights on agriculture produce marketing to mandis will be formally suspended which will naturally suspending APMC provision. It will ultimately wived off themandis fees, thus lowering transaction cost. Second step could be to allow companies, individuals, corporate, FPOs, SHGs, coops, etc., to buy directly from farmers at negotiated price at any location. This will provide farmers a platform to offload their produce and receive payments. Third step could be to withdraw Essential Commodities Act (ETC) from the staples category for the next year. This will encourage these entities to buy from farmer in the next three months so that supply chain keeps running. It is the golden opportunity to dynamize the moribund e-NAM platform. A decentralised system of trading on e-NAM can supplement the mandis and direct farmgate buying. Finally none of the above mentioned step will work without a mechanism for financing the supply chain.

3. Final Produce: As this Covid-19 had overlapped with harvesting period of rabi crop and golden period of most of the tropical and subtropical produce, perishable products need immediate transport and quick consumption. Within perishables there are three main sub-categories.

- i) **Fruits and vegetables:** Fruits and vegetables are relatively less impacted, as harvesting, transportation, wholesale aggregation and retailing have largely remained in place. There has been no spew in retail prices to encourage any major disruption. Movement of mangoes this year will require a special focus, as production and consumption centres being far apart, and exports have been retrenched. Although railway rakes supported by adequate labour could address this.
- ii) **Dairy sector:** This sector which converts milk into *khoya*, sweets and other dairy products, has been affected badly under lockdown. No weddings and public functions, have shrunken the demand for *paneer* and there are several reports of milk prices dropping at the village level. Appreciatively, the organised sector and the cooperatives continued to buy milk and maintain supplies for urban consumption centres. Government should help in and financially assist the cooperative sector to lift larger quantities and convert it into milk powder. This will help in stabilising prices.
- iii) **Poultry sector:** This sector where the impact is drastic, leading to extensive distress. Covid-19 has created baseless fears among consumers, resulting in a sharp drop in consumption of both meat and eggs. Slaughterhouses are shut down at many places. Poultry farmers invests huge sums in raising birds, and with limited storage options. Farmers mostly are forced to cull, or dispose them at throwaway prices. The government must intercede actively. Poultry as being one of the most

organised part of agriculture with large aggregators. Direct support through cash transfers duly verified by banks and state governments is urgently needed.

Foodgrains and oilseeds are among more stable commodities, and the risks around them are of different nature. The lockdown commenced when crops in many parts of the country were just harvested or about to be harvested. Inefficient storage or a delayed harvest could result poor quality and higher prices.

4. Agri-input Ecosystem: As agriculture cannot operate in vacuum, inputs are required to nurture plants and animals. Similarly the output are to be harvested, processed and made available for consumption. India needs about 250 lakh quintal of seeds for kharif season. Inputs for kharif plantings are required from the month of May onwards and should be made available to the remotest villages. Preparation of such seeds occurs between March to June. It begins from the farmers field where pollination etc. are being monitored by specific teams. After harvest, drying and selection of seeds are done and sent to processing plants. From there they are sent to laboratories for testing and finally are packed and supplied to farmers. While, agrochemical companies are required to produce crop care products, and bulk fertilisers which are to be transported in railway rakes and trucks. Packaging material will be needed. The raw material for these in turn are to be manufactured or imported. Likewise, delivery of fertilizer via international market is problematic as almost all the factories in every country had been shut down. The backward supply chain is long and fragmented. Input producers must immediately identify the linkages and inform both central and state governments with the list of items whose movement should be allowed without hindrance. As agri input ecosystem have collapsed now so government should allow all sub trades and manufacturing unit associated with agri input to function. Once necessary government instructions are issued, industry

should facilitate its communication down the line, including checkposts, ports, and trans-shipment points.

5. Export and import: The Indian export and import will be facing greater challenges during this pandemic due to low consumer demand and port hurdles since the major countries such as the USA, Europe, China, etc will grapple with COVID-19 for the next six months exhibiting negative growth rate. Apart from Iron ore, which has registered a growth of 58.43%⁶, all other commodities displayed a negative growth. This decline in exports and imports has been observed mainly due to the ongoing lockdown and global slowdown which may be aggravated due to the current crisis of COVID-19. Moreover, the prices for export oriented commodities like seafood, mango, grapes and other products are crashing which will be highly affecting the future crop availability.

Majority of agricultural commodity has been recorded with negative growth during March 2020 vis-à-vis March 2019 including Oil meals (-69.85%), Meat, dairy & poultry products (-45.48%), Leather & leather products (-36.78%), Tea (-33.74%), other cereals (-33.42%), Organic & inorganic chemicals (-32.88%), Cotton yarn/fabs./made-ups, Handloom products etc. (-32.16%), Rice (-28.28%) etc. (Table 1). Cumulative value of exports for the period April-March 2019-20 was USD 314.31 billion as against USD 330.08 billion during the period April-March 2018-19, registering a negative growth of (-) 4.78 per cent in Dollar terms (Table 1).

Major agricultural commodity groups which have recorded during March 2020 vis-à-vis March 2019 are cotton raw waste (-28.65%), Vegetable oil(-24.81%), Pulses (-29.24%), Fertilizers, Crude & Manufacture(-57.25%), wood and wood products (-34.17%), etc. (Table 2). Cumulative value of import for the period April-March 2019-20 was USD 330.79 billion as against USD 3359.46 billion during the period April-March 2018-19, registering a negative growth of (-) 7.98 per cent in Dollar terms (Table 2).

Table 1: Quick estimates for selected major commodities for march 2020 for export trade

S. N.	Commodities	Values in Million USD				% Change	
		Mar'19	Apr'18-Mar'19	Mar'20	Apr'19-Mar'20	Mar'20	Apr'19-Mar'20
1	Tea	74.49	830.93	49.36	826.32	-33.74	-0.55
2	Coffee	106.00	822.34	79.02	738.90	-25.45	-10.15
3	Rice	928.66	7750.61	666.03	6382.84	-28.28	-17.65
4	Other cereals	27.59	348.97	18.37	202.21	-33.42	-42.05
5	Tobacco	94.82	981.33	74.00	904.87	-21.96	-7.79
6	Spices	389.11	3322.45	281.54	3658.11	-27.64	10.10
7	Cashew	56.98	654.43	41.25	566.76	-27.60	-13.40
8	Oil Meals	194.19	1508.65	58.54	813.23	-69.85	-46.10
9	Oil seeds	116.65	1156.77	115.02	1316.80	-1.39	13.83
10	Fruits & Vegetables	313.99	2540.90	301.24	2367.38	-4.06	-6.83
11	Cereal preparations & miscellaneous processed items	149.49	1555.45	114.28	1529.14	-23.55	-1.69
12	Marine Products	528.06	6802.56	393.61	6721.80	-25.46	-1.19
13	Meat, dairy & poultry products	413.73	4363.72	225.57	3713.71	-45.48	-14.90
14	Iron Ore	154.24	1317.29	244.36	2633.19	58.43	99.89
15	Mica, Coal & Other Ores, Minerals including processed minerals	465.03	4254.71	306.63	3928.46	-34.06	-7.67
16	Leather & leather products	412.53	5140.85	260.78	4645.24	-36.78	-9.64
17	Ceramic products & glassware	247.72	2649.16	209.98	2861.06	-15.23	8.00
18	Gems & Jewellery	3424.32	40251.03	2018.69	35806.10	-41.05	-11.04
19	Drugs & Pharmaceuticals	2002.00	19146.55	1545.58	20701.65	-22.80	8.12
20	Organic & Inorganic Chemicals	2327.13	22379.30	1561.96	22393.24	-32.88	0.06
21	Engineering Goods	9422.52	83621.65	5435.04	78710.56	-42.32	-5.87
22	Electronic Goods	930.09	8829.43	730.00	11766.28	-21.51	33.26
23	Cotton Yarn/Fabs./made-ups, Handloom Products etc.	1045.79	11215.15	709.47	10018.99	-32.16	-10.67
24	Man-made Yarn/Fabs./made- ups etc.	465.78	4980.51	350.17	4811.27	-24.82	-3.40

25	RMG of all Textiles	1717.58	16138.29	1118.05	15488.70	-34.91	-4.03
26	Jute Mfg. including Floor Covering	23.37	324.93	21.67	341.40	-7.26	5.07
27	Carpet	127.00	1481.85	82.91	1376.43	-34.72	-7.11
28	Handicrafts excl. handmade carpet	171.13	1838.08	123.38	1794.71	-27.90	-2.36
29	Petroleum Products	3616.93	46553.58	2491.27	42782.44	-31.12	-8.10
30	Plastic & Linoleum	763.50	8607.48	491.16	7558.78	-35.67	-12.18
	Sub-Total	30710.41	311368.93	20118.93	297360.57	-34.49	-4.50
	Grand Total	32717.74	330078.09	21406.39	314314.22	-34.57	-4.78

Note: Exports include Re-Exports; the figures for MAR'20 are provisional while Grand total is inclusive of component 'Other'

Source: <https://commerce.gov.in/InnerContent.aspx?Type=TradeStatisticsmenu&Id=254>

Table 2: Quick estimates for selected major commodities for march 2020 for import trade

S. N.	Commodities	Values in Million USD				% Change	
		Mar'19	Apr'18-Mar'19	Mar'20	Apr'19-Mar'20	Mar'20	Apr'19-Mar'20
1	Cotton Raw & Waste	58.15	633.05	38.77	1327.84	-33.33	109.75
2	Vegetable Oil	964.50	9890.32	677.67	9634.24	-29.74	-2.59
3	Pulses	135.73	1140.76	89.75	1439.03	-33.88	26.15
4	Fruits & vegetables	169.65	2143.87	151.48	2224.27	-10.71	3.75
5	Pulp and Waste paper	117.89	1311.74	68.84	1143.00	-41.61	-12.86
6	Textile yarn Fabric, made-up articles	136.56	1899.99	86.65	1923.92	-36.55	1.26
7	Fertilisers, Crude & manufactured	541.40	7467.44	216.28	7469.11	-60.05	0.02
8	Sulphur & Unroasted Iron Pyrites	13.80	217.13	4.93	117.83	-64.27	-45.73
9	Metaliferrous ores & other minerals	491.26	7583.26	259.05	5034.60	-47.27	-33.61
10	Coal, Coke & Briquettes, etc.	2104.65	26177.77	1609.28	22454.80	-23.54	-14.22
11	Petroleum, Crude & products	11781.69	140920.64	10014.97	129430.73	-15.00	-8.15
12	Wood & Wood products	502.13	6126.48	308.89	5611.59	-38.48	-8.40
13	Leather & leather products	80.54	1057.69	51.94	1013.09	-35.51	-4.22
14	Organic & Inorganic Chemicals	1911.56	23827.74	1356.18	20664.94	-29.05	-13.27
15	Dyeing/tanning/colouring materials	271.56	3221.93	185.55	2905.91	-31.67	-9.81
16	Artificial resins, plastic materials, etc.	1329.84	15682.00	943.22	14631.09	-29.07	-6.70
17	Chemical material & products	625.76	7707.56	499.89	7655.36	-20.11	-0.68
18	Newsprint	71.04	977.66	35.56	700.54	-49.94	-28.35
19	Pearls, precious & Semi- precious stones	3010.39	27075.65	1401.14	22377.85	-53.46	-17.35
20	Iron & Steel	1578.31	17656.72	855.24	15368.11	-45.81	-12.96
21	Non-ferrous metals	1109.56	14732.96	817.28	13139.41	-26.34	-10.82
22	Machine tools	423.61	4642.48	246.28	4191.01	-41.86	-9.72
23	Machinery, electrical & non- electrical	3212.58	37852.39	2193.59	37749.36	-31.72	-0.27
24	Transport equipment	2021.89	24775.78	2263.37	18435.64	11.94	-25.59
25	Project goods	345.09	2375.57	98.04	1983.49	-71.59	-16.50
26	Professional instrument, Optical goods, etc.	507.96	5187.40	343.91	5010.83	-32.30	-3.40
27	Electronic goods	4671.55	57377.29	3312.42	54504.76	-29.09	-5.01
28	Medicinal & Pharmaceutical products	548.19	6359.47	412.48	6656.23	-24.76	4.67
29	Gold	3286.21	32910.06	1227.88	28228.30	-62.64	-14.23
30	Silver	109.32	3748.22	97.20	2728.05	-11.09	-27.22
	Sub-Total	42132.35	492681.01	29867.73	445754.93	-29.11	-9.52
	GRAND TOTAL	43719.04	514078.42	31164.59	467193.07	-28.72	-9.12

Note: Imports include Re-Imports; the figures for MAR'20 are provisional while Grand total is inclusive of component 'Other'.

Source: <https://commerce.gov.in/InnerContent.aspx?Type=TradeStatisticsmenu&Id=254>

5. Supply chain -a complex network: The food supply chain is a complex network. One of the main services of the agricultural sector is food production, providing raw materials for other sector, employment, income generation and expanding non-oil exports. The agricultural sector is one of the most important and influential sector in the country's food security, a permanent economy, a shock absorber and a neutralizer of economy. The food supply chain includes various phases of production, processing of goods (factories) and transportation and storage (warehousing), retail and goods services.

On 3rd March 2020, Food Corporation of India reported around 77.6 million tonnes (over three and half times the minimum operational buffer-cum-strategic stock of 21.4 mt) required to be maintained for April 1, 2000 [7]. The National Agricultural Cooperative Marketing Federation of India (NAFED) was holding 2.25 mt of pulse stock on March 2019

[8]. As bumper new wheat crops arrived along with fresh arrival of rabi pulse crop such as chickpea, red lentils and field pea reflects no real issue of production. As most of rabi crop are close to harvest so, only marketing of produce and reaching to consumer is being impacted the most. There will not be supply but a supply chain problem arising from restriction on movements. But for the rice, wheat and pulses, FCI and NAFED should not be in concern as the grains are only to be moved from godowns and supplied to ration shop. It could be an opportunity for centre to significantly offload its surplus foodgrain stock. Whereas, among different inputs of dairy industry, milk is directly from farmers or through bulk vendors while sugar comes from cane sourced growers via sugar factories. Two third of edible oil consumed by India is imported. In current situation of lockdown there are actually mitigating factor on supply requirements. The managing director of the Gujarat cooperative Milk Marketing

Federation RS Sodhi, claims about the daily sales of Amul Milk which is currently about 37 lakh litres in Delhi-NCR and 22 lakh litres in Maharashtra, as against the normal levels of 31-32 lakh litres and 18-19 lakh litres respectively. On the other hand, sale of skimmed milk powder to icecream companies and cheese to pizza maker have crashed due to low demand.

7. Double hit: There was a huge financial loss predicted owing to untimely rain and hailstorms in the month of January, February and even March, added lockdown due to the pandemic had proved a double whammy to the farmers. The future was apparently uncertain not only for those whose rabi crop was standing ready in the fields for harvesting but also lakhs of cane-growers in western UP, prepared with fields for sowing. Leaving everyone clueless about reaching their fields as ban was imposed movement because of the pandemic and all were facing the acute dearth of agricultural labourers.

8. Sudden diversification leading to changes: As sufficient rice stocks are with India, a major shift in cropping pattern away from rice in northern India is overdue and imperative. In this part of India rice cultivation is a heady mix of skewed policy as free water and an advantaged procurement price regime favouring rice cultivation. About 4 tonnes of water is required to grow 1 kg of rice. A considerable shift from economically and environmentally challenged rice cultivation in northern India which obviate the malady of crop burning residue. This could be major contributor to reducing the pollutant load in the month of October and November. Also, many marginal and small farmers in peri urban Bangalore diversified their crops from rose to vegetable cultivation to meet local needs.

Challenges to Farmers

1. Immediate impact on their activity which will result to economic and political order that will be seen after crisis.
2. Gradually, taking shape its impact on climate change and thing entailed with rain pattern, temperature alteration-choice to crop selection.

Govt. Efforts

Immediately after nation-wide lockdown was announced government has taken different mitigation measures to provide relief in adverse situation of pandemic to protect the vulnerable section of society. The government has raised the wage rate for workers engaged under NREGS. Additional grain allotment are announced for next three months to the registered beneficiary under Pradhan Mantri Garib Kalyan Yojana. Also, cash and food assistance is provided to persons engaged in the informal sector such as migrant labourers etc. For which PM-CARES fund has been create. Other government measures for agricultural sector are:-

Realising the importance of timely completion of important farm operations such as harvesting, marketing and the upkeep of the crop produce, the Indian Council of Agricultural Research (ICAR) issued state wise guidelines for farmers, farm labourers and other stakeholders in this lockdown. The broad objectives of these advisories are to save the farm workers from getting affected with coronavirus and preventing the spread. Specific practices are mentioned by the advisory form harvest and other operations to minimise the impact of this pandemic on Indian agriculture. The national as

well as the state-specific advisories are translated into 15 languages and circulated in the form of an e-book^[9].

During COVID 19 lockdown period that is 24th March 2020 till 17th April 2020, the DBT payments under all the Central Sector/Centrally Sponsored Schemes through PFMS amounted to Rs. 27,442.08 crore in the accounts of 11, 42, 02, 592 beneficiaries through schemes like PM KISAN, Mahatma Gandhi National Employment Guarantee Scheme (MNREGS), National Social Assistance Program (NSAP), Prime Minister's Matru Vandana Yojana (PMMVY), National Health Mission (NHM), National Rural Livelihood Mission (NRLM), Scholarship Schemes of various ministries through National Scholarship Portal (NSP) are provided^[10]. For short term crop loan Interest subvention and Prompt Repayment Incentive (PRI) during the year 2018-19 and 2019-20 is provided by the government^[11].

The Union Minister of Agriculture & Farmers' Welfare have launched new features of National Agriculture Market (e-NAM) Platform to strengthen agriculture marketing by farmers to reduce the need to physically come to wholesalesandis for selling their harvested produce, at a time when there is critical need to decongest mandis to effectively fight against COVID-19^[12]. Food grains were provided to Non-NFSA beneficiaries with ration cards issued by State governments. FCI sets up new record transporting 77 rakes carrying about 2.16 Lakh MT food grains across the nation^[13].

The states were informed about the various exemptions by the Centre as follows:

- Agencies engaged in procurement of agriculture products, including MSP operations;
- Farming operations by farmers and farm workers in the field;
- 'Mandis' operated by the Agriculture Produce Market Committee or as notified by the State Government;
- 'Mandis' include direct marketing, facilitated by the State Government/UT Administration, directly from the farmers/groups of farmers. FPOs, Cooperatives, etc.
- Shops for Seeds, Fertilisers and Pesticides;
- Manufacturing and packaging units of Seeds, Fertilisers and Pesticides;
- Custom Hiring Centres (CHC) related to farm machinery;
- Intra and inter-state movement of harvesting and sowing related machines like combined harvester and other agriculture/ horticulture implements;
- Cold storage and warehousing services;
- Manufacturing units of packaging material for food items;
- Transportation for essential goods;
- Shops of agriculture machinery, its spare parts (including its supply chain) and repairs.
- Tea industry, including plantation with maximum of 50% workers.

A presentation was made by centre and states were requested for the following:

- To sensitize their field agencies for facilitating smooth farming operations including sowing, harvesting and marketing.
- To ensure expeditious permission for movement of staff and labour and goods, machines and materials of

agencies engaged in these exempted categories of activities.

- To issue authorization letters to companies/organizations having nation-wide supply chain of essential goods, allowing them to issue regional passes for easy movement of critical staff and workers in order to maintain their national supply chain.
- While undertaking these activities the norms of 'social distancing' should be followed and proper hygiene and sanitation should be ensured at all public places ^[14].

To facilitate farmers and traders government in launched Kisanrath app for searching transport vehicles for primary and secondary transportation for the movement of agricultural and horticultural produce in lockdown ^[15].

Certain steps were made at state level also - Department of horticulture and plantation crops of Tamil Nadu has launched an online platform to sell vegetables online in wake of corona lockdown ^[16].

Suggestions

Banks may pass on the benefits of reduction in the repo rate by reducing their lending rates. The margin on sugar and ethanol valuations could be relaxed to 10 per cent, from the current 15 per cent and 25 per cent respectively, so that drawing power can be increased. The repayment period for the soft loans announced by the central government in March 2019 for the sugar industry could be extended for a year; export subsidies to be paid to sugar mills. Oil marketing companies should be asked to lift piled ethanol stocks, as delaying will create bottlenecks in northern India's sugar factories and result in curtailment of operations.

Another instance for converting crisis into opportunity is to allow parallel marketing structures to come up and coexist. Government should encourage banks to provide concessional finance and give incentives for purchase, by virtue of eliminating the middle man. This will boost farmer's income. While there is no support price structure in place for fruits and vegetables, market price have fallen far below MSP for critical crops that are usually procured. Government could ask private traders to buy the crop at defined rate and give them the difference between the market price and MSP. This payment can be made once they produce warehouse receipts from certified warehouses.

Timetable for mandis could be drawn, earmarking when produce from which village will be accepted. This could be communicated to villages in advance. Sanitation and hygiene protocols should be enforced. Traders' associations, as voluntarily stopped operations will need to be persuaded to open shops and work within the social distancing guidelines.

The post covid era will possibly witness de-centralisation of the supply chain. Firm may move closer to the source by creating of supply chain hubs in small region to keep the produce safe and reduce the transportation overhead enabling of competitive pricing in market and higher returns to the farmers. In this way Private Entrepreneurs Guarantee Scheme can be extended to fight cold storage capacity and introduce food hubs to meet the demand of emerging population. Government may find a space in assisting this to strengthen food security in the emerging uncertainty of geo economical and geo political background. Lastly, the government must evaluate as it will be the most efficient method of financial support to farmers. As certain steps under the direct transfer system are already been declared, and many would be in the pipeline. All this sum up to a huge ask. But being the nature

of the crisis, opening the purse strings could be the only way out.

Conclusion

Outbreak of coronavirus has brought the economies to a virtual standstill with only sector serving-agriculture. Till date the faulty policies has made agriculture to suffer and enable farmers to shift to cities. This pandemic is time to find them and acknowledge their roles in society.

The above reviewed information provides us the knowledge on how the agricultural sector of India has been affected and facing the challenges due to the pandemic COVID-19. Main concern of the government becomes to take measures to minimise its effect on the country's food security. The farmers have been asked to take general precautions and safety measures while harvesting the crops, post harvest operations, its storage and ultimately during the marketing of rabi crops.

The government must open its purse strings and meet their immediate requirement of funds by infusion through account system. This will provide some assistance for the time being. This pandemic will have a silver lining if the policies are finally evolved to provide the largely undocumented migrant workers with a social security. Any economic amelioration is clearly going to be a long haul and is linked inextricably to the rehabilitation of these workers. Their well-being is important to both farm and industry. It is time for refurbishment of priorities to ensure that the backbone of the economy are given their due.

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