

IMPACT OF COVID -19 LOCKDOWN IN AGRICULTURAL FIELD IN INDIA

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Abstract: The purpose of this study was to assess the impact of the COVID-19 blockade on India's agricultural production, livelihood, food security and dietary diversity. The Prime Minister of India announced a complete blockade on March 24, 2020. As a result, tens of thousands of people have fled major cities due to unemployment and returned to rural areas to escape the pressure to support their families in high-cost cities. .. They returned to the unemployed in their village and competed for local jobs with other migrant workers who could not travel to find jobs in other communities currently suffering from labour shortages. Rural markets have been completely or partially closed due to obstacles that prevent farmers and harvesters from earning income. As a result, farmers were in urgent need of funding to maintain their agricultural system, especially since April is the harvest season for rabbi (spring). In conclusion, it was found that the Indian quarantine from COVID-19 mainly affects the sales capacity of farmers.

Keywords: COVID-19; Agricultural System Field; COVID Impact, Pandemic;

INTRODUCTION

COVID-19, originating from Wuhan, China – the epicentre – has finally unfolded via the entire international and emerged right into a pandemic. India has already turn out to be a hotspot for the virus, subsequent to the USA, infecting 9.6 million (14.6% of worldwide infection) as of December 6th, 2020. Pandemic shocks have an effect on all of the sectors of an economic system. The lockdown has significantly impacted the agricultural regions as well. This challenge research the effect of pandemic led lockdown at the agriculture area. The Indian authorities ordered a national lockdown, the severity of that is from twenty fifth March, 2020 affecting the economic system consisting of agriculture. The opposite labour migration brought about shortage of labour which affected harvesting of the wintry weather (November–March) plants like wheat and pulses adversely. Huge buffer shares of rice and wheat supplemented via way of means of a report harvest in 2019–20 crop seasons enabled the Indian meals gadget to address the pandemic. At the identical time tonnes of meals grains have been wasted in step with a central authority report, on the Food Corporation of India (FCI) garage structures. On March 24, 2020 the Government of India ordered an entire lockdown of the country as a reaction to the COVID-19 pandemic. This paper reviews at the numerous outcomes of the lockdown for farming structures in India, consisting of the economic system, deliberating the related emergency responses of nation and countrywide governments. It identifies and analyzes the various factors that contributed to the intense disruption of farming structures and the rural area as an entire following the lockdown.

CORONAVIRUS 2019 (COVID-19)

The recent outbreak of the novel SARS-CoV-2 virus, also called coronavirus 2019 (COVID-19), has evolved into one among the foremost serious pandemic situations within the past hundred years (Dhama et al., 2020a, Dhama et al., 2020b, Sohrabi et al., 2020). Worldwide, entire populations are experiencing lockdown situations aimed toward slowing the spread of the disease, causing disruption to economic activities and abrupt changes in policies so as to mitigate the pandemic's health impacts (Ayittey et al., 2020; Bhagavathula et al., 2020, Chatterjee et al., 2020; Kumar et al., 2020c; Singh et al., 2020a). This includes India, the world's fifth-largest economy in 2019, which is now facing an unprecedented depression thanks to COVID-19. During a recent South Asia Economic Focus update published by the planet Bank (2020), the Indian economy is currently projected to shrink by 4.8% in 2020 and by an extra 2.8% during a baseline scenario for 2021 thanks to COVID-19. However, empirical evidence of the precise impacts on food and agricultural markets remains emerging. (2020) and Mahajan and Tomar (2020) reported a drop of about 10% within the online availability of varied foods (with no impact on retail prices) within the immediate aftermath of the primary Indian lockdown. India took action early to limit the spread of COVID-19, ordering a 21-day nationwide lockdown for its population of 1.3 billion people starting on March 24, 2020. As a result of these initiatives, it's only recently that the pandemic has spread widely in India compared to other countries (Kumar et al., 2020d). Hence, as of May 16, 2020, the amount of reported infections was still comparatively low at 90,648 accumulated cases and 2871 deaths (Worldometer, accessed May 16, 2020). By comparison, by November 14, 2020, the amount of cumulative reported infections in India had soared to 9,308,751 cases, with 135,734 deaths being recorded, placing India second only to the us in terms of total infections (Worldometer, accessed November 27, 2020).

The Indian government has generally viewed the pattern of COVID-19's spread as almost like the 2009 H1N1 influenza pandemic and assumed as a result that the disease is unlikely spread uniformly. The principal activities of most of the people in developing countries usually relate to farm-level systems and agricultural production (Singh et al., 2020b), which are intrinsically linked to their livelihoods, the economy, social systems and therefore the environment. Within the developing countries of South Asia, the agricultural sector generally contributes quite 20% to Gross Domestic Product (GDP) (IMF, International fund, 2020) and may be a natural focus for economic activities aimed toward fostering more or less sustainable development in terms of making growth, jobs, trade and new businesses and mitigating poverty. The environmental impact of associated agricultural activities, including the supply of other (natural) ecosystem services (Costanza et al., 1998), depends on the intensity of the farming, which agricultural practices are used and locally varying factors like soil conditions, climate variability, etc. within the wake of the “green revolution” in Asia, agricultural activities have increased in most countries and seen the increase of latest innovations and technologies. This has successively resulted during a general trend towards increasing pressure being placed on forests and other natural ecosystems that seems likely to continue (Porter et al., 2014). Due to extensive COVID-19 mitigating actions nationally, economic activities related not only to Indian farming systems but to farmers everywhere South Asia have faced several severe hits thanks to the weird circumstances that have arguably outweighed the direct impacts of COVID-19 (Mahendra Dev, 2020; Pothan et al., 2020). For instance, during the lockdown in India transportation has largely been halted, thereby reducing yields and compromising food security. During the height of the spring harvest, produce could often not reach the agricultural markets or “mandis”, thus severely disrupting normal supply chains.

Comparing India's experience with similar emergency responses in developed countries in, for instance, Europe, it's evident that a lot of of the results reported here are characteristic of developing countries with an agro-based economy and an agricultural sector that's less industrialized. As it is, the present situation in India has the potential to stall development of the agricultural sector for several years to return and/or lead it during a direction that's not aligned with the Sustainable Development Goals (SDGs).

COVID-19 IMPACT IN THE AGRICULTURE SECTOR

The suffering of people and the crisis of the economy have been aggravated because of a stubborn refusal by the Central government to acknowledge that there is a crisis, take responsibility for its mismanagement, and provide relief to the people. In reality, despite almost two months having passed since the lockdown was first imposed, the Central government has provided nothing by way of support to farmers. On the contrary, newer and newer challenges have confronted the farmers as the cropping cycle progressed from March through May. In fact, its refusal to acknowledge the seriousness of the crisis has resulted in worsening of distress and emergence of new challenges as the agricultural seasons have moved forward. COVID-19 induced significant economic and social disruptions in India. During this lockdown, the Indian government enacted several emergency legislations to provide direct and indirect relief to workers and households. India's COVID-19 social assistance package, namely, PM-GKY, announced in March 2020, was designed to provide immediate relief to the vulnerable population. The PM-GKY provided cash direct benefit transfers (DBT) and in-kind supports (IKS) through existing schemes.

The paper ‘India's COVID-19 social assistance package and its impact on the agriculture sector’ by International Food Policy Research Institute (IFPRI) examines the impact of India's government assistance package (known as Pradhan Mantri Garib Kalyan Yojana or PM-GKY), announced immediately after the lockdown, on the procurement of agricultural inputs for the upcoming farming season. Agricultural policy experts posit several hypotheses to explain the resilience in the agricultural sector, including the pandemic's timing, immediate public policy response, and the creation of infrastructure for social transfers, among others. The time lag in the procurement of 2019–2020 Rabi season production may have impacted the liquidity concerns of farmers for the upcoming 2020 Kharif season (July–November). Moreover, the trading in the agriculture sector in India is mainly physical, and the farmers failed to receive the payments for their produce immediately after the transaction. At the same time, 85% of Indian farmers are marginal and small, 50% of farmers rely on informal credit, and 20% bought agricultural inputs on credit. The food grain production for the 2019–2020 Rabi and 2020 Kharif season has increased significantly by 5 and 2%, respectively, compared to the previous year. In contrast, the 2020 Kharif season (summer crop), is considered to be most impacted by the COVID-19 pandemic. The delay in the receipt of farm revenue coupled with the COVID-19 pandemic affected farmers' credit and liquidity to meet input requirements for the kharif season.

The government of India announced the COVID-19 social assistance package of INR 1.7 lac crore (or 25 billion US\$) under the Pradhan Mantri Garib Kalyan Yojana (PM-GKY) to provide immediate relief to the vulnerable population. The PM-GKY package uses existing schemes to provide additional benefits to farmers and rural households. The study focuses on four major schemes potentially relevant to the benefits of the farmers. Under the PM-KISAN, farmers did not receive an additional benefit. Still, importantly the scheme payment was frontloaded in the first week of April 2020, which was quite important for farmers for addressing their liquidity constraints. However, the remaining three schemes provide an additional benefit under the package. Although these schemes are not directly meant for farmers, the benefits received through these schemes have implications for farmers' liquidity concerns.

ABRUPT CHALLENGES AMID AGRICULTURAL POTENTIAL

Of all of the measures put in place in response to the COVID-19 pandemic, it was the sudden ban placed on the transportation of crops that initially and seriously impacted agricultural systems in India. Due to the lack of sufficient storage among middle-class

farmers in particular, grains and vegetables continued to ripen in the fields during the lockdown, resulting in some of this year's harvest likely to be damaged. Likewise, the lockdown closed most of the mandis to normal business, and large-scale procurement operations were immediately stopped by the Indian government. As a result, supply chains have stopped working, and the limited availability of vegetables has become a serious issue for the general population, especially in the major cities (Mahendra Dev, 2020). The critical need for large numbers of migrant workers in various Indian states also caused severe problems during the lockdown (Balwinder-Singh et al., 2020) and has continued to do so to some extent. Effectively confined to their native communities, many would-be migrant workers have lost their jobs and are currently unable to earn enough money to sustain themselves and their families. Others have found new work with local farmers at very low wages due to the excessive amount of labor available in some communities. During normal harvests, a lot of Indian farms rely on large numbers of migrant workers to work their fields.

IMPACT ON FOOD SYSTEMS

The Food Bank of India had more than three times the minimum operational buffer in stock at the time of the initial lockdown, but supply and access emerged as critical issues. Long supply chains were severely affected, especially at the beginning of the lockdown, when transport was severely restricted. The decline in regional economic growth, following in the wake of the decline nationally, is an additional threat to food security. India has so far largely been able to ensure a smooth supply of food to its large population of more than 1.3 billion. The mechanisms involved include the option of keeping agricultural markets open, despite recommendations from other quarters. When 50–60% of economic activities in India came to a halt during and after the lockdown, low-income households were quickly exposed to the risk of starvation in some places.

THE ECONOMIC CHALLENGES TO FARMERS

According to the facts of the Government of India, about 263 million human beings are without delay engaged in farming or more normally in the Indian agricultural area. Before COVID-19, agricultural GDP in India had skilled boom fees of around 3. This predicted boom has been replaced by using a pointy decline of about 5% within the first area of FY2020 because of the lockdown. The latest upward fashion in India's agricultural GDP (Mahendra Dev and Sengupta, 2020) is essentially inverse to the improvement of wages within the agricultural region. Hence, facts from the Reserve Bank of India (<https://www.Rbi.Org.In/>, confirms a preferred lower in common nominal rural wages in India, related to both the agricultural region and the "non-agricultural-sectors", with 2020 representing the current "low". Against this modern agricultural production in India is appreciably better than the call for it. This implies that, regardless of the wonderful lengthy-time period growth of Indian agriculture universal, measured by way of GDP, many Indian farmers have been already economically challenged before COVID-19. This suggests that the disruptions delivered by using the lockdown, in lowering the delivery of agricultural produce, had been doubtlessly favourable as a minimum to those farmers who managed to get their items to the marketplace.

IMPACT ON CURRENT INVESTMENT DECISIONS

Farmers' present day investment choices like constructing shade for domestic animals, buying new tractor, constructing new pipelines for irrigation for the brand new cropping season had been halted or delayed due to the lockdown. They were also unable to construct shade for his or her farm animals as raw fabric abruptly got pricey and labour become unavailable.

The farmers in the selected villages were no longer immediately suffering from the disorder as the place become COVID-19 unfashioned within the months of April and May; alternatively they were affected due to the policy selection of the sudden lockdown. They confronted several problems like fee crash in case of soybean, loss of marketplace get entry to in case of the perishable plants, fall in market demand in case of milk manufacturing and halting of investment selections. There had been different particular consequences including saving of labour price because of opposite migration of family participants. These effects have also been mentioned through other researchers. Rawal, and others kingdom that the impact on manufacturers of perishables veggies, end result, milk, eggs and rooster has been even extra extreme than at the manufacturers of cereals, pulses and oilseeds (Rawal, Kumar, Pais and Verma, 2020). Dev and Sengupta have mentioned about the impact on dairy enterprise due to closure of candy stores and restaurants throughout the lockdown (Dev and Sengupta, 2020).

The difficulties and problems faced by the farmers due to the lockdown can not be undone but they will be stored from in addition damage. On one hand there is a want to address the health troubles and keep the lives of people in rural regions, and alternatively it's far necessary to save their livelihoods from further damage. There is a severe want to make the vulnerable farmers more resilient to outside shocks. Following are few recommendations to assist farmers resist the surprising shocks.

IMPACT ON PERISHABLES CROP LOSSES

The effect on manufacturers of perishables — greens, end result, milk, eggs and fowl — has been even greater stark than at the manufacturers of grain. Closure of sweet shops, tea-stores and eating places additionally dealt a blow to the call for these commodities, especially, of milk. The Finance Minister, in her press briefing on May 15, admitted that the call for milk had fallen by 20-25 in step with cent. This led cooperatives and personal dairies to lessen the amount of milk they buy from farmers. Daily sale of milk with the aid of Amul, considered one of the most important dairy cooperatives, declined by means of 30 consistent with cent (Economic Times, 2020). The fall is probable to have been even higher for other cooperatives, non-public dairies and casual suppliers of milk. The MD of Amul reported that "the private or small players or ice-cream makers who were buying milk from the

farmers have stopped doing so due to the fact they do now not recognize what to do with the milk.” Dairy cooperatives did no longer increase their procurement of milk for the duration of the period of the lockdown substantially. The greater procurement of milk is not over and above the same old degree of procurement. This milk became greater because the sales fell extensively due to the lockdown. The dairy cooperatives did no longer spend any more resources to procure milk from farmers because private dairies had stopped shopping for milk at some point of the lockdown. The unsold milk stays with dairy cooperatives, is converted into skimmed milk powder and might be used later. The relevant authorities has no longer given a penny to dairy cooperatives to compensate them either for his or her losses or for the losses of dairy farmers. There have been reports of farmers having to unload their produce and to plough returned status vegetation because the market charges did now not cover even the cost of harvesting. There have additionally been reports of farmers committing suicides due to incapability to promote their produce (Indian Express, 2020). All of this intended that farmers needed to undergo plenty of trouble, and incur extra expenses, for harvesting their plants. A mature crop, if no longer safely saved, may be spoilt due to pests and sicknesses. While perishable plants together with potato and tomato want cold-garage, even grain is prone to being spoilt. In her press briefing on May 15, the Finance Minister introduced that says of Rs. 6,400 crores had been paid through PM Fasal Bima Yojana (PMFBY) during the period of the lockdown. Secondly, under the PMFBY, farmers make a contribution the most important part of the premium. Given this, counting the claims paid beneath PMFBY as relief provided by means of the Central authorities is absurd. Thirdly, under PMFBY, coverage coverage is provided more often than not with the aid of non-public coverage businesses.

AGRICULTURAL MARKETING

A big quantity of agricultural mandis shut down when the lockdown changed into first announced. A precise observe of 1331 mandis throughout the country has proven that during the first 21 days of the lockdown, the wide variety of mandis that have been operational fell very substantially. The scenario turned out to be equally bad in case of gram and mustard seed (Rawal and Verma, 2020). Lack of right infrastructure and centers has additionally created the problem that Coronavirus infections had been spreading amongst traders, employees and retailers who work in the mandis. In Uttar Pradesh, Uttarakhand, Telangana and Andhra Pradesh, non-public cold storages and warehouses had been deemed as Mandis so that investors can freely purchase produce from there without any regulation. In Haryana and Punjab, the government attempted to open many procurement centres in villages, however this simplest had partial fulfillment due to lack of infrastructure or skilled manpower.

TRANSPORT AND DISTRIBUTION OF GOODS AND PRODUCE

The ordinary distribution of critical uncooked materials to farms all over India and from farms to markets has been and is still seriously stricken by the lockdown. For example, regardless of honest efforts by using country governments to make certain the delivery of seed for cultivating crops, seed is not available in enough portions, neither is it reachable to all needy farmers. Another difficulty is nearby shortages of harvesters and fertilizers at the time of the lockdown, an problem that has proved impossible to clear up, ensuing in falling production curves (Sengupta and Felman, 2020).

Unlike vegetable farmers, dairy farmers' reviews of the COVID-19 disaster encompass increased prices for feeds and concentrates. Moreover, due to the fact that shops promoting candies and different related objects aren't working, different sources of income connected to the manufacturing of livestock milk have no longer carried out as anticipated. Consequently, daily farmers want to sell their milk at far beneath ordinary charges and portions.

OTHER INFLUENCING FACTORS

Given the manifold demanding situations confronted by means of farmers in India due to the COVID-19 lockdown, it's far rarely unexpected that many Indian farmers sense they have little to hope for. For instance, even before COVID-19, farmers in the Bundelkhand region of Uttar Pradesh were fighting for years to conquer the demanding situations imposed by means of unpredictable severe climate (e.g. Floods and drought). Most in their assets have therefore already been employed in an attempt to tackle those demanding situations. However, these tries are handiest moderately documented in reputable papers. Due to the absence of the suitable economic aid device, many farmers in Bundelkhand, for instance, are staking the entirety on the “next” crop season, together with putting off large loans and sinking into debt traps. This found conduct actually goes against the longstanding perception that Indian farmers are hazard-averse. In fact, they have got already experimented and invested in enhancements.

Although the lockdown became at the start deliberate to last handiest three weeks, it became extended numerous instances, and farming professionals have grown to be more and more involved approximately the opportunity of the overall economic fall apart of the mandis, in addition to for the implications of these tough instances on farmers' mental fitness (Poudel and Subedi, 2020). In the beyond failed harvests have caused a spate of suicides, that is persevering with nowadays. For instance, in step with reviews posted in national newspapers in May, two farmers from the states of Tamil Nadu and Karnataka devoted suicide because of their failure to promote their farm produce during the primary week of the lockdown (New York Times, 2020). Hence, while the situation is converting from a entire lockdown to a one-of-a-kind, managed kingdom of operations, it is not positive that farming systems can be capable of perform successfully. Rather, despite the special alleviation packages they were given, farmers will very probable stay in an economically tough scenario that might probably cause similarly disruptions to farming operations, together with the dumping of greens, fruit and different farm produce, therefore damaging farmers' financial situations similarly.

SUSTAINABLE DEVELOPMENT OF INDIAN FARMING SYSTEMS

In view of the still aggressive trajectory of COVID-19 infections in India, which would possibly necessitate new measures or the prolongation of present ones so one can continue to have an effect on farming structures, it is appropriate to bear in mind the subsequent questions: (i) What are probable to be the prevailing and future resources of earnings for farmers in India? (iv) What is the answer to the problems with exertions migration? Arguably, all of these problems remain to be addressed nicely. Hence, it seems obtrusive that new and greater sustainable coverage measures and pathways are required that remember regional and demographic differences in India. Vegetables growers, who are normally coins-strapped smallholders, would require unique interest, and it'll be essential to make certain their get entry to town mandis and local markets, for that reason facilitating the sale of their semi-perishable produce like greens. Overall, village- and town-primarily based groups, groups and authorities sellers have to proactively and voluntarily resource the state's farmers to allow the continuity of agricultural operations and ensure income flows. Whether such measures are appropriate from a transformative angle, that is, as a means of selling greater sustainable farm operations in India, is every other rely. On the other hand, one lesson discovered from the present day crisis really indicates where efforts to reap the sustainable development of agricultural structures can be targeted. First of all, the determined loss of qualified employees to work on the farms at some stage in the lockdown points towards an pressing need for improved schooling, which in turn may want to pave the way for improved focus of sustainable agricultural practices in India. While not all of those local trends could be in keeping with the SDGs, there may be no doubt that a few can be able to provide guidance for the sustainability of farm operations in a way that is specially tailor-made to Indian agriculture and which would possibly scale well. Last but not least, throughout the pandemic India has invested big quantities of GDP in maintaining the rural sector and local farmers. If this may be blended with a extra sustainable transition in, as an example, farming structures, cost and distribution chains, and markets, this may no longer handiest increase meals security and resilience to a destiny pandemic, it is able to also pave the way to an enduring and sustainable evolution for India's agricultural structures.

SHIFTING THE FOCUS FROM PRIMARY TO SECONDARY AGRICULTURE

COVID-19 brought on lockdown has disrupted agricultural labour markets that witnessed big opposite migration. A survey reviews that forty five% of the migrants returned domestic in the course of lockdown (Imbert, 2020). Structural weakness in the gadget ought to be addressed to enable recognition of farming as an employer. Processes which add fee to number one agricultural production structures and corporations which source uncooked materials from crop residues, through-products and waste from number one agriculture have to be promoted (Dey, 2019). For example, cotton stalks have a much wider and untapped scope for use as soft and hard boards, paper and pulp manufacture (Chengappa, 2013). Accelerating studies on high-quit secondary agriculture products is urgently needed. Development of fruit-based ice cream, changing bamboo or wooden waste to fancy ornament, instruction of goodies from bovine milk, use of natural fibres and culled potato to put together bio-plastics, pectin extraction from fruit peeled wastes and bio-ethanol manufacturing are a few examples. Further, innovations in the put up-harvest technology of medicinal and aromatic plant life which deliver raw materials to herbal medicines, prescription drugs, cosmetics, and food flavour industries ought to increase export potential and create employment (Chengappa, 2013).

COLLECTIVE FARMING REFORMS IN AGRICULTURAL FINANCE

Crop farmers should heed the a success cases like dairy cooperatives to growth productiveness and profits. The procurement, processing, and distribution network of dairy cooperatives resisted the exogenous shock. Crop farmers ought to come collectively both as cooperatives or farmer manufacturer corporations (FPOs) or farmer manufacturer agencies (FPCs) and work in the network of the international food system. These steps collectively could have the capability to triumph over challenges of production and advertising risks of the farmers. Concerted efforts and inter-institutional partnership (nearby in addition to global) are inevitable (Baudron and Liegeois, 2020) as envisaged inside the Sustainable Development Goal 17 to strengthen the weaker and susceptible sections of the society. Stakeholder partnerships assist to bridge the records and knowledge gaps via growing cognizance, leveraging Information and Communication Technologies (ICTs) together with social media systems.

STRENGTHENING FPCS AND FPOS AND PROVIDING ALTERNATIVES

Farmer collectives like Farmer Producing Organizations (FPOs) and Farmer Producing Companies (FPCs) can be hooked up and strengthened to collectivize and deliver voice to the small and marginal farmers. It has been argued that those collectives would be extraordinarily useful in reaping the benefits of economies of scale (Boss, Pradhan and Roy, 2020). Farmers might be provided the understanding, cognizance and resources of opportunity methods of storing the perishable plants. If farmers are made aware of the approach of processing onions, like making sliced dry onions, they could be stored from losses. Farmers get to recognise the expenses via WhatsApp agencies or from their own family and buddies. They do no longer have company and fool evidence records about the real time prices. It is extraordinarily important for the farmers to have a few knowledge about the market on the way to keep away from the problem of facts asymmetry.

ACCESS TO AGRICULTURAL INPUTS

April and May are a notably lean season for sales of agricultural inputs like fertilizers and insecticides. In Indian States like West Bengal, Bihar and Assam, an irrigated crop of quick-length rice is sown in early March and harvested by using cease of May/early

June. In Uttar Pradesh and Bihar, a brief-duration crop of summer pulses is grown in among the Rabi harvest and Kharif sowing. Village evaluation reviews prepared for the duration of the primary section of the lockdown mentioned problems farmers have been having in obtaining agricultural inputs. For instance, a file via Raya Das on 3 villages in West Bengal confirmed that agricultural enter stores were closed, and there was no sparkling deliver because of the non-availability of transport. Due to a scarcity of agricultural inputs, farmers had been allocating less land to Boro paddy cultivation. However, tenant farmers, operating on land that had already been leased on constant-lease contracts for the season, have been maximum probable to stand losses both from a reduction in cultivation of boro rice or low yield, if the supply of fertilizers continues to be disrupted. The call for for fertilizers could increase in June as farmers would want to achieve them for basal manuring within the kharif crop. They will even need plant protection chemical substances which include fungicides and insecticides for the kharif crops. The problems in get entry to to inputs will get compounded as the demand for agricultural inputs for the kharif season rises. The import dependence has increased substantially beneath the current authorities as fertilizer policies have deprived each farmers and domestic manufacturing. Disruptions in worldwide supply chains could result in shortages in fertilizer availability throughout the kharif season.

PUBLIC PROCUREMENT

The government is claiming that public procurement is taking place at a fast pace and has almost been completed. The Minister for Agriculture and Farmers’ Welfare made those claims in a press briefing on April 29. In her press briefing on May 15, the Finance Minister claimed that Rs. 74300 were spent on purchases of grain via the government at the MSP. These claims, however, are some distance from true. The statistics on procurement released by way of the Food Corporation of India show that, even till May 15, 2020, procurement become handiest eighty three in line with cent of the total procurement ultimate year. Further, over 96 in keeping with cent of the wheat has been procured from simply four States (Punjab, Madhya Pradesh, Haryana and Uttar Pradesh). In Haryana, the procurement till May 15 become only 61 according to cent of the entire amount procured final year. In Uttar Pradesh, procurement until May eleven become much less than one third of the whole procurement last 12 months. Also, ninety one in keeping with cent of procurement has been carried out by means of State-degree procurement corporations and the Food Corporation of India has procured simplest nine per cent of the wheat procured till May 11.

If one takes the claim of the Finance Minister in her Press Briefing on May 15, this quantities to the authorities having procured 370 lakh tonnes of wheat. As in step with information which has for the reason that ends up to be had, authorities had definitely procured simplest 283. Sixty three lakh tonnes. This implies that the government had spent best Rs. 57674 crores on procurement at MSP until May 15, whilst the FM claimed that the authorities had spent Rs. 74300 crores on procurement at MSP.

GOVERNMENT OF INDIA, ICAR AND LOCAL GOVERNMENT INITIATIVES

Immediately after the introduction of the lockdown, the Indian Minister of Finance announced financial assistance amounting to INR 1.7 lakh crore (24 billion US\$) aimed at protecting vulnerable communities and those below the poverty line from the adverse impacts of the pandemic, covering about 800 million people nationwide. This will partly happen through the PM KISAN (Pradhan Mantri Kisan Samman Nidhi) scheme, which in 2020–21 will front-load a cash instalment of INR 2000 to all farmers, with the first instalment to be paid out by April 2020. This scheme will offer INR 2000 to Indian farmers three times after every fourth month. The Government of India also raised the wage rates for workers engaged under the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) / National Rural Employment Generation Scheme (NREGS), one of the world's largest wage-guarantee schemes.

PM-JDY scheme aims for financial inclusion by opening a savings bank account for the unbanked adult person. The existing benefit includes INR 2 lac insurance coverage. Under PM-GKY, there is a provision of additional benefits in cash transfer of three instalments of INR 500 each to the 204 million women account holders for April, May, and June 2020.

Date	COVID-19 initiative
March 30, 2020	Allocation of additional food grains under the PM Garib Kalyan Anna Yojana scheme
April 9, 2020	The Food Corporation of India (FCI) provides food grains to non-NFSA beneficiaries with state ration cards at a rate of 5 kg/ person/ month
May 15, 2020	Measures are announced for the agricultural sector under the Aatmanirbhar Bharat Mission
June 30, 2020	The PM Garib Kalyan Anna Yojana scheme is extended for another five months, till November 2020
July 9, 2020	The distribution period for free food grains under the Atma Nirbhar Bharat Mission for migrant laborers is extended till August 31, 2020
August 23, 2020	Government directs states and union territories to include all eligible disabled persons under the National Food Security Act 2013

The Pradhan Mantri (PM) Garib Kalyan Anna Yojana scheme (Prime Minister's Scheme for the Welfare of the Poor) aims to take

care of the most vulnerable of India's population. According to the Food Corporation of India (FCI), on 1 April 2020 food grains totaled 77 million tons of cereals against a buffer supply requirement of 21 million tons. As already mentioned in Section 3.3 and as indicated in Table 1, it was decided to distribute 5 kg of free grains to people registered under the National Food Security (NFS) Act to prevent issues with food security. It is estimated that the FCI's stocks, with help from the government, may be freed up to aid migrants registered under the schemes of different states (Verma, 2020).

The Atma Nirbhar Bharat scheme, which amounts to INR 20 lakh crore (equivalent to 10% of India's GDP), was introduced in the hope of helping to make India independent of the strong competition in the global supply chain and to help empower the poor, laborers and migrants who have been adversely affected by COVID-19 (Indian Economy, 2020).

Finally, a program called PM CARES (Prime Minister's Citizen Assistance and Relief in Emergency Situations) has recently been set up to provide cash and food assistance to people engaged in the informal sector, mostly migrant laborers, and to build the capacity to resolve similar national challenges caused by future pandemics (Carberry and Padhee, 2020). Combined, the different programs provide massive financial assistance to the agricultural sector. Even so, Mahendra Dev (2020) recently noted that an estimated 87 million farmers in India have far largely "refrained" from expressing much optimism (Mahendra Dev, 2020), although these financial initiatives do seem to have done much to sooth farmers' concerns during the extended lockdown period.

The Indian Council of Agricultural Research (ICAR) has been spearheading several government initiatives to assess and mitigate the impacts of the COVID-19 lockdown on agriculture and its allied sectors. This includes preparation of a road map to minimize its disadvantages and prevent the worst impacts on farm and food systems. While the government has exempted many key agricultural operations, from harvesting to the transportation of produce to the markets, from the directives of the lockdown, ICAR has been responsible for issuing specific advice to farmers, directing them to take general precautions and safety measures during harvesting, post-harvest operations, storage and the marketing of Rabi crops. ICAR was responsible for issuing specific advice on farm practices applicable to Uttar Pradesh, which were then shared among farmers in every district by KVK agricultural extension services using social media such as email, WhatsApp, mobile messaging and phone calls. By the end of May, a total of 679 related messages and advisory documents had been circulated by KVK experts in Uttar Pradesh using WhatsApp, mKISAN and Kisan Call Centers, reaching more than 500,000 farmers. This by any standard was a commendable effort by the state's frontline extension system.

RESULTS AND DISCUSSION

Findings show the cash transfer scheme had a positive and significant impact on the procurement of agricultural inputs. In terms of magnitude, the results indicate that beneficiaries of the cash-transfer program were about 16 percentage points more likely than non-beneficiaries to purchase the agricultural inputs for the 2020 kharif season immediately after receiving the assistance.

In the case of seeds, the result shows that program beneficiaries were about 14 percentage points more likely than non-beneficiaries to purchase the seeds for the 2020 kharif season immediately after receiving the assistance. The increased procurement of agricultural inputs may be driven primarily by increased purchases of seed.

The above findings underscore the importance of the government relief package under COVID-19 on farmers' behaviour in farm inputs procurement. The results, in the case of small and marginal farmers, are similar to those of all farmers. As expected, the magnitude of the impact is lower than for all farmers, even though small and marginal farmers are more vulnerable. The assistance package had a significant positive impact on the acquisition of agricultural inputs.

Note that the magnitude of the impact of the government assistance package on the procurement of agricultural inputs and seeds is significantly higher than that of the program transferring cash to farmers. A plausible reason could be that when farmers received multiple benefits under the overall package, they had additional benefits (such as cash transfer for women, conditional cash transfer for buying cooking gas, and free food rations). Interestingly, we find the government assistance package had a positive and significant impact on the procurement of fertilizers and pesticides (about a 4% increase). An explanation for this finding could be that the additional assistance under the package relaxed the liquidity constraint to a large extent, such that farmers purchased expensive agricultural inputs such as fertilizer.

It reveals that other components of the government assistance package and the component transferring cash to farmers resulted in increased spending on agricultural activities by all farmers in general and by small and marginal farmers in particular. We find a similar pattern of results for the smaller and marginal farmers.

SUMMARY AND CONCLUSION

Despite the government's launch of the suite of initiatives mentioned earlier, many of the particular disruptions experienced by the agricultural sector are expected to persist into the Kharif (autumn) harvest season. This is in spite of the relatively few cases that occurred initially, compared to the country's size. As of September 2020, this situation has changed dramatically, with India now occupying second place in the world with respect to the number of infections. The pandemic led crisis has wreaked havoc on both the Indian and global agricultural system. India – as per the Nomura Food Vulnerability Index (ranked 44) – has been placed as less vulnerable to large price swings than its neighbouring countries like Bangladesh (12), Philippines (23), Pakistan (32) and Hong Kong (42) (Subbaraman and Loo, 2020). The role of state becomes much more pertinent as the pandemic continues to threaten the global food system.

Multi-level impacts of the COVID-19 lockdown on agricultural systems in India: Highlights

- The lockdown in response to COVID-19 has seriously disrupted Indian farms.
- Farms have been less profitable amid rising food prices, putting pressure on food security.
- A lack of migrant labour has led to a loss of produce and affected the spring harvest.
- Experience and relief packages may help to develop Indian agriculture sustainably.

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