



e-ISSN: 2319-8753 | p-ISSN: 2320-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 10, Issue 6, June 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.512



9940 572 462



6381 907 438



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Impact of Covid-19 on Agricultural Food Grain Products-A Geographical view of Karnataka State

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ABSTRACT: The Covid -19 pandemic is a global health crisis that is already having devastating impacts on Agricultural products. No sector has escaped from the degradation of losses occurred by covid-19. The following paper deals with the impact of covid-19 on the Agricultural sector of the food grain market. The analysis is organised at the district level but it has a more specific focus on the Karnataka state. The continuous lockdown has severely impacted the supply chain disruptions of several agricultural food grains. The impact of covid-19 on the agricultural food grain has a different perspective in various districts of Karnataka depending on the climate, cropping pattern, irrigation pattern, labour pattern and market access. Moreover, the unavailability of migrant labourers incepting the harvest and post-harvest operation has resulted in a decrease in GDP growth in the Agricultural food grain market. Thus the pandemic situation of covid-19 has given rise to several challenges in the procurement of food grain. The following effect has empathized across the large economy and will have the possibilities of having still a longer impact.

KEYWORDS: Covid-19, Agriculture, Food Grains, Karnataka

I. INTRODUCTION

The **COVID-19 pandemic**, also known as the **coronavirus pandemic**, is an ongoing global pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus was first identified in December 2019 in Wuhan, China. The World Health Organization declared a Public Health Emergency of International Concern regarding COVID-19 on 30 January 2020 and later declared a pandemic on 11 March 2020. As of 26 May 2021, more than 167 million cases have been confirmed, with more than 3.48 million confirmed deaths attributed to COVID-19, making it one of the deadliest pandemics in history.

The pandemic has resulted in significant global social and economic disruption, including the largest global recession since the Great Depression. It has led to widespread supply shortages exacerbated by panic buying, agricultural disruption, and food shortages.

Numerous educational institutions and public areas have been partially or fully closed, and many events have been cancelled or postponed. Misinformation has circulated through social media and mass media. The pandemic has raised issues of racial and geographic discrimination, health equity, and the balance between public health imperatives and individual rights. Covid-19 has significantly impacted the production rate of food products in Karnataka.

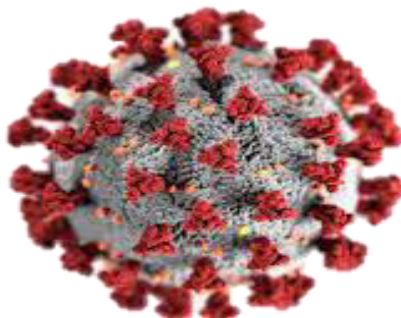


Fig-1: Graphical representation of Covid 2019

Karnataka is situated in the southwestern region of India. It is one of the most prosperous states in India. Karnataka has made tremendous progress in the fields of education, industry, agriculture, literature and tourism. Agriculture is a major occupation for most people in rural Karnataka. About 123,100 sq. km of land is cultivated in Karnataka.

This is about 64.18% of the total geographical area of the state. The major crops grown in the state are cereals, pulses, oilseeds and cash crops. Ragi, paddy, maize, jawar, and bajra are the major food crops grown in Karnataka. The main oilseed crops in the state are sunflower, safflower, groundnut and sesame. Important crop exports from the state include coffee, tea and mango. Karnataka produces more than 55% of the raw silk produced in the country.

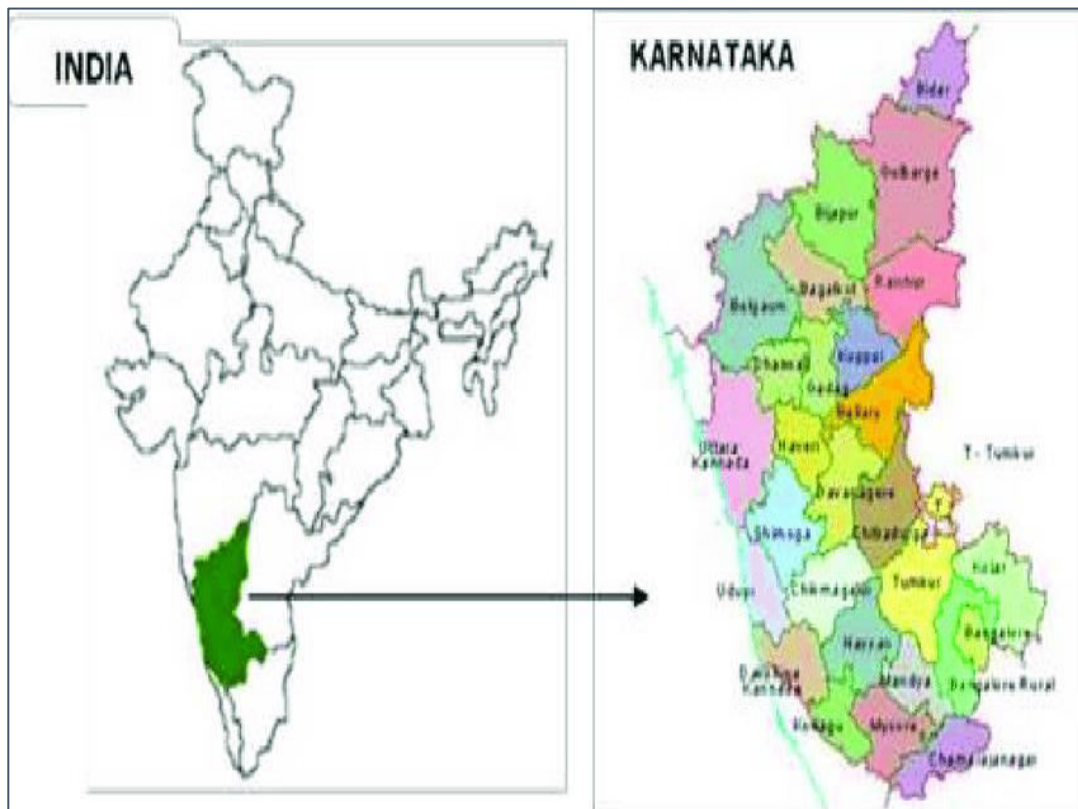


Fig-2: Map of Karnataka State

Geographical Analysis of Karnataka:

The Karnataka state is located 11.5° North and 18.5° North latitudes and 74° East and 78.5° East longitude. It is situated on a tableland where the Western and Eastern Ghat ranges converge into the complex, in the western part of the Deccan Peninsular region of India. The State is bounded by Maharashtra and Goa States in the north and northwest; by the Arabian Sea in the west; by Kerala and the Tamil Nadu States in the south and by the States of Andhra Pradesh and Telangana in the east. Karnataka extends to about 750 km from north to south and about 400 km from east to west.

Climate:

Karnataka witnessed three types of climates. The state has dynamic and erratic weather that changes from place to place within its territory. Due to its varying geographic and physiographic conditions, Karnataka experiences climatic variations that range from arid to semi-arid in the plateau region, sub-humid to humid tropical in the Western Ghats and humid tropical monsoon in the coastal plains. More than 75 % of the entire geographical area of Karnataka, including interior Karnataka, witnesses arid or semi-arid climate. Karnataka has about 15 % of the total semi-arid or 3 % of the total arid areas marked in India.

- ✓ **Coastal Karnataka:** This region stretches over the districts of Udupi, Uttara Kannada and Dakshina Kannada. The entire coastal belt and the adjoining areas have tropical monsoon. The area receives heavy rainfall. The



average annual rainfall in Coastal Karnataka is about 3456 mm, which is much more than the rainfall received in the other parts of the state.

- ✓ **North Interior Karnataka:** This region extends over the districts of Bagalkot, Belgaum, Bijapur, Bidar, Bellary, Dharwad, Haveri, Gadag, Gulbarga, Koppal and Raichur. This area is an arid zone. North Interior Karnataka receives the least amount of rainfall in the state and the average annual rainfall is just 731 mm.
- ✓ **South Interior Karnataka:** This region spreads over the districts of Bangalore Rural, Bangalore Urban, Chitradurga, Chamrajnagar, Chikmagalur, Hassan, Kodagu, Kolar, Mysore, Shimoga and Tumkur. This zone experiences a semi-arid type of climate. South Interior Karnataka receives an annual average of 1286 mm rainfall.

The temperature in Karnataka:

Karnataka experiences the lowest temperature during January and then the temperature gradually increases. The temperature begins to soar rapidly during March. The southern parts of the state generally experience the highest temperature during April while in the coastal plains the temperature reaches its maximum during May. Post monsoon, during October and November the temperature decreases in the state and comes down further during December.

Rainfall:

Karnataka is a province where the occurrence and distribution of rainfall are not uniform across the state. Karnataka receives a mean annual rainfall of around 1355 millimetres. The state receives two monsoons: the North-East monsoon (October to December) and the South-West monsoon (June to September). Karnataka receives about 80% of the annual rainfall during the South-West monsoon period (June to September), 12% during the post-monsoon period (October to December), 7% during the summer season (March to May) and only 1% rainfall are received during the winter season (January to February).

Rainfall distribution in Karnataka decreases as one moves from the western part of the state to the eastern areas. The Western Ghats and the coastal region of Karnataka receive a mean annual rainfall of more than 4,000 mm. But as we approach the eastern parts of the state, the mean annual rainfall comes down to around 400 mm, showing the vast difference in the rainfall received across the state. While the coastal region on the windward side of the Western Ghats gets 3,350 mm of rainfall during the southwest monsoon, on the leeward side of the Western Ghats the rainfall drastically declines to around 600-700 mm. This means the state experiences a gradual decrease in rainfall as one move towards the West Coast.

Soils:

There are varied types of soils in Karnataka. Soil orders are recognized, based on differences in soil formation processes, as reflected in the nature and sequence of soil horizons. Black soils are found in northern Karnataka whereas red and red loamy soils are prominent in southern Karnataka. Laterite soils are found in malnad and coastal areas of the state. A brief description of the properties of these soil groups, along with their distribution across districts of Karnataka, is presented below.

- ✓ **Black soils:** These soils are derived from basalt, though some are formed from limestones, shales, alluvium and schists. These soils have high plasticity, stickiness and a tendency to swell and shrink when subjected to wetting and drying cycles.
- ✓ **Red soils:** These form the most widespread soil type in Karnataka. The red soil results from the weathering of the crystalline and metamorphic rocks and its red colour comes from the diffusion of iron oxide in high proportions.
- ✓ **Red loam soils:** These are generally deep to very deep and the clay content can vary. The soils are subject to intense leaching. They are fairly well-drained in the uplands and waterlogged in low-lying areas.
- ✓ **Mixed red and black soils:** The coarse-textured red soils with high permeability are found in upland areas whereas deep, clayey, poorly drained black soils occur in the lowlands and valleys.

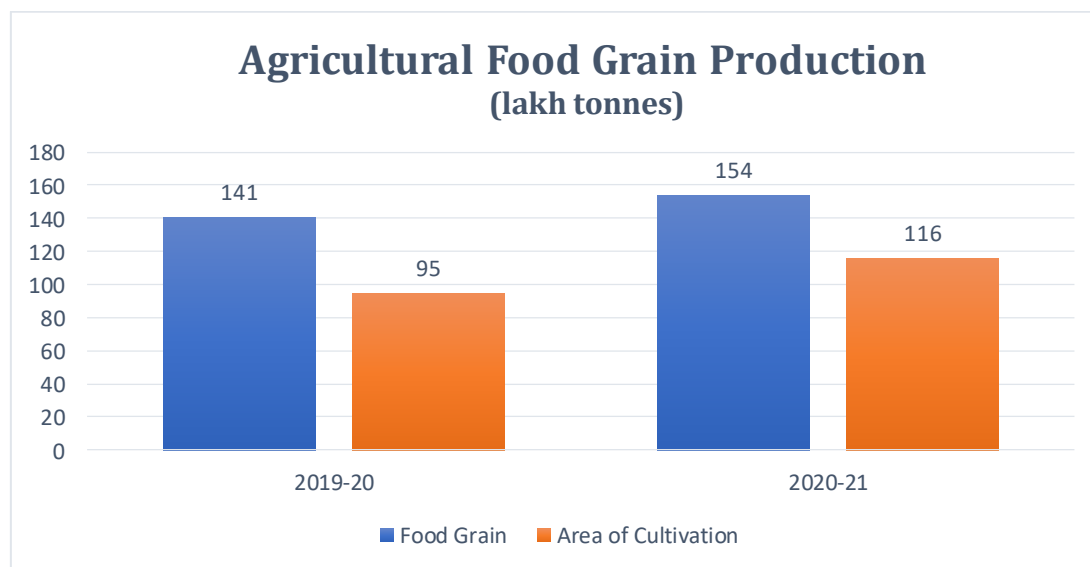
Agricultural Production of Karnataka:

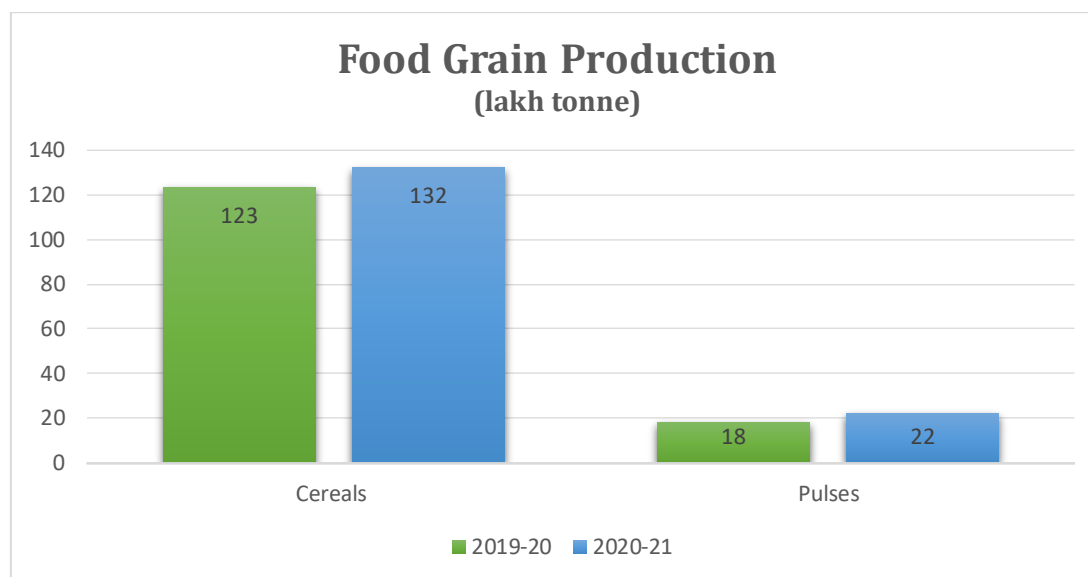
Karnataka, which is prone to drought, floods and landslides, manage these numbers because of fairly widespread rainfall that covered around 65 per cent of the state. Good rain in arid districts such as Tumakuru, Chitradurga, Chikkaballapur and Kolar also boosted food production. The states agriculture department's data shows, farmers planted winter (rabi) crops on nearly 50 lakh hectares, which is nearly 30 per cent higher than normal. The total area of sowing during the Kharif, rabi and summer seasons touched 116 lakh hectares, which increased the chances of a bumper harvest. "Higher sowing during the rabi season was mainly on account of robust rains in October.

The agriculture sector, which accounts for 50 per cent of the rural economy, was also able to shake off the impact of Covid-19 because of ample subsidised inputs such as fertilisers under the AtmaNirbhar package. "During the peak pandemic months last year, the farm sector was the only bright spot in the state economy. The pandemic didn't affect agricultural activities,". The farm sector turned out to be more resilient than the urban economy, mainly because of sufficient rain and reverse migration. "People returned to agriculture after losing their jobs in cities. Ample stocks helped keep a lid on food prices,"

Table-1 :Production of Food Grains (lakh tonnes)

Year	Cereals	Pulses	Total
2019-20	123	18	141
2020-21	132	22	154
Increase in %	7.3	22.2	9.2

Graph-1: Graphical presentation of Agricultural Food Grain Production**Graph-2: Graphical representation of Food Grain production**

**Productivity for the year 2019-20:**

In the year 2019-20 Karnataka has faced a huge fall in food production having seen unprecedented rainfall and floods during both Kharif and rabi season. In the year 2019-20 around 70% of Karnataka's food grain production have been affected by heavy rains and floods.

The agricultural output in Karnataka state for agricultural food grains was 141 lakh tonnes consisting of 123 lakh tonnes of Cereals and the remaining 18 lakh tonnes of Pulses under the area of cultivation of 95 lakh hectares.

Productivity for the year 2020-21:

In the year 2020-21 the state produced 154 lakh tonnes, a record, as against 141 lakh tonnes in 2019-20. This is 30 per cent more than the state's average food production of 115 lakh tonnes.

Cereals accounted for 132 lakh tonnes and pulses 22 lakh tonnes, in the area of cultivation comprising of 116 lakh hectares. Tab-1 show the increase in production of cereals by 7.3% along with an increase in pulses by more than 22.2% making an overall increase of 9.2 % as against 2019-20.

Factors affecting the production of Agricultural food grain products during covid-19:**1. Peak harvest with no procurement:**

- This is the apex of the Rabi season in Karnataka and crops like wheat, gram, lentil, mustard, etc. (Including paddy in irrigated tracts) were at a harvestable stage or almost reaching maturity.
- This is also the time when the farm harvests reach the minds for assuring procurement operations by designated government agencies.

2. Labour unavailability due to reverse migration:

- The non-availability of Labour has hurt operations in many regions.
- Consequently, the shortage of migrant labour has resulted in a sharp increase in daily wages for harvesting crops.
- Some parts of agriculture that have the luxury of deploying technology for harvestings, like Paddy and Wheat, are relatively more isolated since they often do not have to depend on large numbers of manual labour.

3. Fall in prices:

- Agricultural prices have collapsed due to a lack of market access, including the stoppage of transportation and closing of borders.
- The rise in labour prices and lack of access means that farmers are staring at huge losses and hence allowing crops to rot in the fields, a better stop-loss mechanism.

4. Scarcity of public commodities:

- Making the food grains, fruits and vegetables and other essential items available to consumers, both in rural and urban areas, is the most vital challenge.
- Transportation of public distribution system PDS items to last-mile delivery agents, by both rail and road, has been severely impacted at the outset.

5. Restrictions on Sale:

- There were self-imposed restrictions on the inter-and inter-State movements of farmers/labourers, as well as harvesting and related farm machines.

6. Disruptions in the supplychain:

- The absence of transport facilities clubbed with vigilant blocking roads has a defining effect on the movement of migratory harvest labour and Agri-machinery. Also, trucks and tractors are not inclusive of „farm machinery“ by definition.

7. Lockdown induced debt and Cash Flow Constraints:

- The most important issue that farmers have to overcome is the problem of repaying their crop loans, gold loans and other informal debts.
- Crop loans are repaid between April and May and a fresh loan is given at the onset of a new season.
- Any failure to do so will mean that they will be pressured to borrow money from the informal sector at high rates of interest for the new seasonal.

Immediate Challenges on Agricultural Sector during covid-19:

- ✓ Despite all these, we have been raised regarding the negative implications of the COVID-19 pandemic on the farm economy. This is the peak of rabi season in India and crops like wheat, gram, lentil, mustard, etc. (Including paddy in irrigated tracts) are at the harvestable stage or almost reaching maturity.
- ✓ This is also the time when the farm harvests reach the market yards for assuring procurement operations by designated government agencies. Moreover, any severe disruption to the supply of perishable fruits and vegetables, dairy products, fish, and so on Having mobilized to fulfil the increasing demand from a bulging middle class as well as urban and rural consumers, may create irreparable damage to all actors in the supply chain.
- ✓ The migration of workers from fewer parts to their native places has also triggered panic buttons, as they are of the essence for both harvesting operations and post-harvest handling of produce in storage and marketing centres.
- ✓ Making the food grains, fruits and veggies and other essential items available to consumers, both in rural and urban areas, is the most critical challenge for Government machinery during the lockdown period.
- ✓ The smooth functioning of the supply chain, with adequate safety measures for the people involved, is of paramount importance. Transportation of public distribution system (PDS) items to last-mile delivery agents, by both rail and road, has to be ensured by several Government agencies.
- ✓ As the ongoing lockdown coincides with the Rabi harvesting season, farmers across the country look up to the Government to ensure uninterrupted harvesting of the crops as well as smooth procurement operations.

Mitigation Measures are taken to boost the production:

- ✓ Prime Minister Narendra Modi has actively discussed proposals to ease the lockdown selectively for rural areas to allow harvesting of Rabi crops.
- ✓ Based on the policy directions of the Indian government, various Ministries/ Departments of state governments have issued implementation guidelines to facilitate the continuation of activities related to agriculture and its allied sectors.



- ✓ Indian Council of Agricultural Research (ICAR) has also issued an agro-advisory to maintain hygiene and social distancing among farmers working in their fields.
- ✓ The Government of India has announced that the first instalment of the PM-Kisan Yojana payment to farmers, i.e., Rs. 2,000 will be paid upfront to farmers, benefitting over 8.7 crore Indian farmers. It has also announced that the wages under MGNREGS will be raised from Rs. 275 to Rs. 289 per day.
- ✓ The Reserve Bank of India (RBI) has announced a moratorium on agricultural term loans (including crop loans) for three months.
- ✓ The central and state governments have done much to allay fears in the minds of farmers by quickly announcing exemptions for the agriculture sector – seeds, labourers and farm-related activities.
- ✓ The Indian Railways has been roped in to ease transport logistics of agricultural produce.
- ✓ The Karnataka government has ensured that the transportation of wheat to mandis be done in a staggered manner to ensure social distancing. All this is being taken care of by the district administration with the help of the police. Farmers will be given passes to go to mandis with their produce.
- ✓ The government has initiated a dialogue with the exporters of Agri and allied commodities to gain a first-hand account of the problems being faced by the exporters of such commodities and initiate necessary steps by making meaningful interventions for early redressal of their problems.
- ✓ The common issues highlighted by exporters of all Agri commodities related to availability and movement of labour, inter-state transport bottlenecks, shortage of raw materials due to closure of mandis, phytosanitary certification, closure of courier services thereby, hampering movement of shipping documents, availability of freight services, access to ports/yards and clearance of goods for imports/exports is being worked out across levels.
- ✓ Allowing critical agricultural activity, filling in gaps in agricultural supply chains and ensuring farmer's ease is imperative for the smooth functioning of the backbone of our economy.

Suggestions:

Reverse migration due to COVID-19 provides an opportunity for the hinterland administration to engage the returned labourers in gainful employment, and the sole short-term option is to leverage the potential of farming.

- ✓ The labour has to substitute for the probably reduced input application in agriculture to help sustain the production level, resulting in an increased factor share of labour in the agricultural sector.
- ✓ Intra-household food insecurity is better addressed by generating awareness and targeting women and minors who are out of anganwadis now. Income transfer measures could also be really helpful in reviving rural demand.
- ✓ Long-term strategies should be qualitatively different, focusing more on other sectors. Nonetheless, Improving labour and land productivity would be a vital strategy.
- ✓ Increasing the allocations for direct transfer to farmers through PM Kisan and including everyone who is actively involved in farming irrespective of where (s)he owns a given piece of land or not, from Rs 6,000 to at least Rs 10,000 per farming family for this year (2020-21).
- ✓ Farm supply chains can be redirected to local areas by incentivising farmers to sell more and more of their products in local cooperative style channels.
- ✓ Government should take necessary actions for the construction of check dams and ponds taking initiative for different land bindings under the MGNREGA scheme for Agricultural food Grain products.
- ✓ Encouragement should be promoted to Horticultural farming to reduce the scarcity of food grain production. Advance plantation and irrigation methods with modern equipment have to be followed to enhance the growth and agricultural land.
- ✓ Different Development programme such as the Distribution of free seed, pesticides and fertilizers should be undertaken by Government to gain the interest of farmer in Agriculture.



- ✓ Karnataka government should take initiative to encourage APMC movements for Agricultural products and also provide interest-free agricultural loan for the farmers with less basic incentive.

II. CONCLUSION

Crises not only create problems but also throw up many opportunities. Some opportunities could be turned into solutions. Thanks to research in dryland agriculture, some resilient crops and varieties promise both foods as well as nutrition security. What is more, some varieties grow in 2-3 months. The government could encourage these institutions to pool the available seed material and immediately initiate a large-scale seed multiplication programme by SAUs, KVKs and farmers, so that the actual seed availability by July 2021 is a lot more than what it is now. The MGNREGS works for the immediate three months and the seeds made available for the following 3-6 months should ensure that farmers stay in villages where they belong, and do what they are best at – farming.

It can be concluded that at the county level in Karnataka, the further process of agriculture will be disrupted because of the Kharif season. The state requires to have 250 lakh Quintiles of seed for this season, but with various barriers coming out, this has not been procured till now. This is not merely the end of this impact. It is the starting point. The government needs to step in at the right time so that the biggest sector of the economy does not fail lost during these tough times. The food supply chain has been hit the strongest by the pandemic, which also results in a shortage of food security amongst the most vulnerable segment of the population.

Apart from that, if we run deeper, we will observe that the migrant labour or crisis directly affects the agricultural sector employment. Various labourers have been rendered unemployed and due to this; the demand for food will also go down from their terminal. With no money to feed themselves, they would hold up on cheaper sources of food. The end of the lockdown will not end the problems. On the contrary, they are probable to be compounded at the onset of the new agricultural sowing season. There is a greater demand for government support in the form of support for other agricultural inputs. Lack of any relief will only cause the agricultural crisis worse. The need of the hour is to maximize the possibilities of agriculture, which has established its utility and resilience in trying times.

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