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Agriculture in South India, in the Aftermath of COVID-19 Pandemic Lockdown

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ABSTRACT

Agriculture is considered the backbone of the Indian economy. As a result of COVID-19, a global pandemic, many countries were being under lockdown. This imparted a huge impact on the agricultural sector. South India, being considered as the rice bowl of India, is also facing drastic clampdowns during the prevailing conditions. Agriculture sector was affected negatively because of the imposed lockdown. Current study was focused at the evaluation of the effect of COVID-19 lockdown conditions on the agricultural sector of South India. In this online survey, we have designed a systematic questionnaire, in which the questions related to seeding, seed availability, workmen scarcity, farming machinery availability, post-harvest management, consumer demand for the Agri products, transportation, marketing management, etc., were asked. Responses from the farmers of south India were collected. The results show that, there was a remarkable decline in the farmers' income because of lack of labour, machinery, seed availability and also a great loss due to a decrease in demand. Hence, with an immediate need we analyzed the adverse effects that were imposed on South Indian agriculture during the shutdown circumstances and also, we were aimed to frame certain alternatives to combat the upcoming food crisis.

Key words: Agriculture, COVID-19, Lockdown effect, Online survey, South India

COVID-19 (Novel Corona virus disease/ SARS CoV2) is an infectious disease, originated in Wuhan, china in December 2019 was declared as a global pandemic by World Health Organization (WHO), though it was initially announced as a public health emergency [8]. In view of the devastating effects of COVID-19, International Labour Organization (ILO), Geneva has stated that 'it is the worst global crisis since the second world war'. Agriculture is one of the three sectors at most risk, listed by ILO, the other two were workers at transport and essential public health services. They have mentioned Agri workers as frontline works, who facilitate the people to meet their basic needs [5].

Food and Agriculture Organization (FAO) stated that the agriculture remains central to economic development and also more than 60% of the global population relies on agriculture for their livelihood and survival. Over the last five decades, a 2-4% increase is being reported in global agricultural production [4]. Effects of COVID-19 on food

production, supply chain, food prices, and migrant workers were analyzed, and reported that the impact could persist for

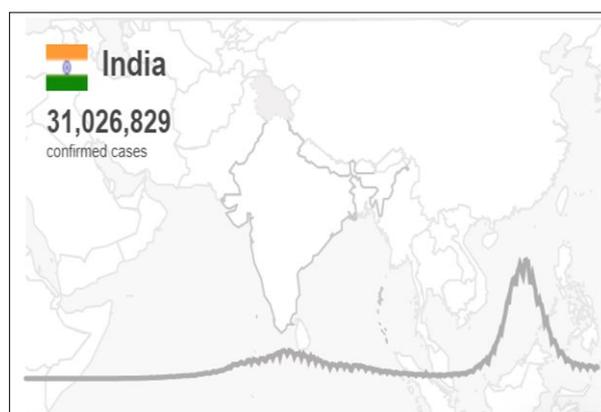


Fig 1 COVID-19 spread graph from 3 January 2020 to 7:21pm CEST, 16 July 2021, showing the total number of confirmed cases till date along with the first and second waves of the outbreak (In India, there have been 31,026,829 confirmed cases of COVID-19 with 412,531 deaths, reported to WHO as on 16-07-2021)

Source: WHO Coronavirus (COVID-19) Dashboard)

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the coming couple of years [11]. Though the agricultural produce was exempted from the directives of the lockdown in India, considering it as one of the essential commodities,

still the agricultural sector was faced a broad range of implications those jeopardized the whole sector of agriculture. Cariappa *et al.* have assessed the impact of COVID-19 on the Indian agricultural system and they have also formulated a ten-point strategy to combat the crisis, in which family farming, stakeholder partnerships, social safety net, risk management, secondary agriculture, etc., were included [3]. Agriculture is a sector which subsequently leads to zero hunger, one of the seventeen sustainable developmental goals listed by United Nations Organization. And also, it is necessary to study the agricultural sector, as it involves the human life sustainability and economy as primary and secondary objectives respectively. Hence, in our study, we have attempted to evaluate the impact of COVID-19 pandemic on the agriculture sector with an emphasis on South India.

MATERIALS AND METHODS

The present study is an online survey, conducted in the South Indian states viz., Andhra Pradesh, Telangana, Karnataka, Tamil Nadu and Kerala during April-June, 2020. A well-structured questionnaire containing twenty-seven

questions related to agriculture during the pandemic lockdown was prepared and was circulated among the farming community of the above-mentioned states. The sample of the study was selected randomly. Over one thousand responses were recorded from all the farmers belonging to these states. For the convenience of the respondent farmers, the questionnaire forms were made in the local languages also (as they live in rural areas mostly). Technological advancements and social media were been instrumental in conducting this survey.

RESULTS AND DISCUSSION

In order to evaluate the effects of COVID-19 pandemic lockdown conditions on the agriculture sector of South India, we have conducted an online survey. The results are being presented here within with the consent of the respondents. Out of thousand respondents, 929 (92.9%) were male and the remaining were female. Female farmers were responded from all the other four states except Tamil Nadu. The complete details of the distribution of the number of respondent farmers according to their domicile states were presented in (Table 1).

Table 1 Distribution of individuals participated in the survey

State	Participated individuals		Total
	Male respondents	Female respondents	
Andhra Pradesh	405	25	430
Telangana	278	22	300
Karnataka	70	10	80
Tamil Nadu	120	00	120
Kerala	56	14	70
	929 (92.9%)	71 (7.1%)	1000

The sample of the study was the group of farmers falling into the age group of 20-60 yrs. Out of them 37% belong to the 20-30yrs age group, 25% belong to the 30-40yrs age group and 23% belong to the age group of 40-50years. Whereas the remaining 15% was shared as 12% and 3% by the individuals of 50-60years age group and below 20 years group respectively. Their educational status was also collected in the study, which shows a 4% of the population were uneducated, in contrast, 52% were graduates. Similarly, 87% of them were farmers while the others are daily waged labour working in the agricultural

sector. Most of them were cultivating a huge variety of crops i.e., mainly paddy and also tomato, beans, groundnut, black gram, green gram, millets, maize, cotton, pineapple, sesame, tobacco, cassava, and sugarcane, etc., in the fields with diverse soils such as black soil, red soil, clay soils, and sandy loam soils.

Problems faced by farmers

The majority of the total respondents were opined that they were unable to continue their agriculture activities during the lockdown times.

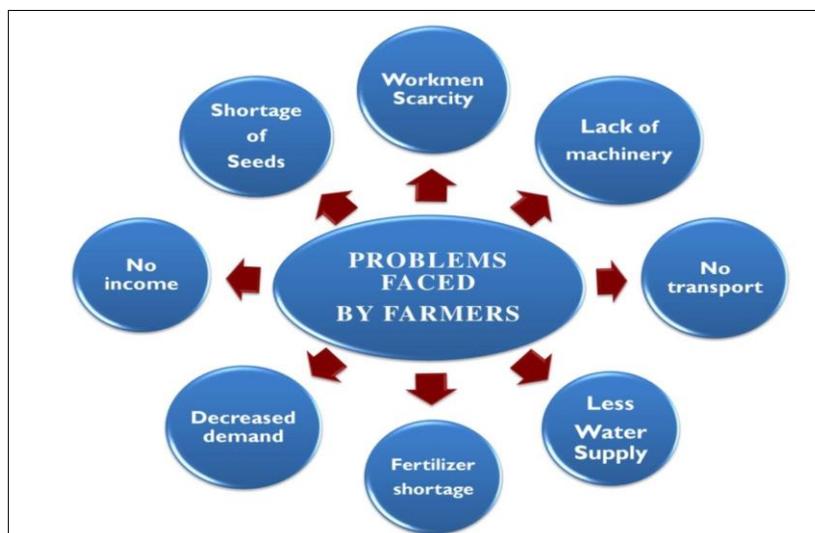


Fig 2 Various problems faced by farmers

Shortage of labour

Manpower is one of the primary requirements for agricultural activities. Shortage of labour was a major hurdle to the farmers in order to proceed with their regular farming. In the current pandemic situation, a massive reduction in food grain production to a maximum of 23%, equivalent to a maximum economic loss up to \$1.48 billion, was estimated due to the reverse migration of working labour [2]. Jaacks et.al reported that 14% of the respondents in their survey reported a yield loss due to the non-availability of labour [6]. In the state of Uttar Pradesh, India, labour shortage greatly affected the April harvest, leading to a great decline in agricultural wages in some communities and an increase in others, as well as to critical losses of agricultural produce [9]. Various steps in farming viz., Seeding, Sowing, fertilizer application, irrigation of the fields, harvesting the crop and post-harvest management, etc., are the activities that require enough manpower to handle the work on time. But this cycle was fluctuated due to the lockdown imposed in control of the pandemic spread. Out of one thousand people, 72 percent were unable to get enough manpower. Only a 28% of the respondents opined that they were somewhat managing to overcome the workmen scarcity, but

not completely.

Availability of Seeds

In order to initiate the cultivation of a crop, farmers need seeds of better quality. Seeds that can generate huge yields would benefit the farmer in various ways. Only 53% of the respondents were able to get enough seeds for their farming and the rest of 47% was reported that there is no availability of seeds.

Variation in farmers' income

As a result of all the other problems faced by farmers of South India, there is a huge variation in their agricultural income. This has been affected them to a higher extent. In our study, the information collected from the farmers regarding their income was analyzed, and finally, we evaluated that there was a huge decline in their income when compared between the income before and after the imposition of pandemic lockdown / COVID-19 outbreak, as shown in *Figure 3*. Seventy-nine percent of households with wage-workers witnessed a decline in their wages and 49% of farmers with incomes from livestock also witnessed a decline [6].

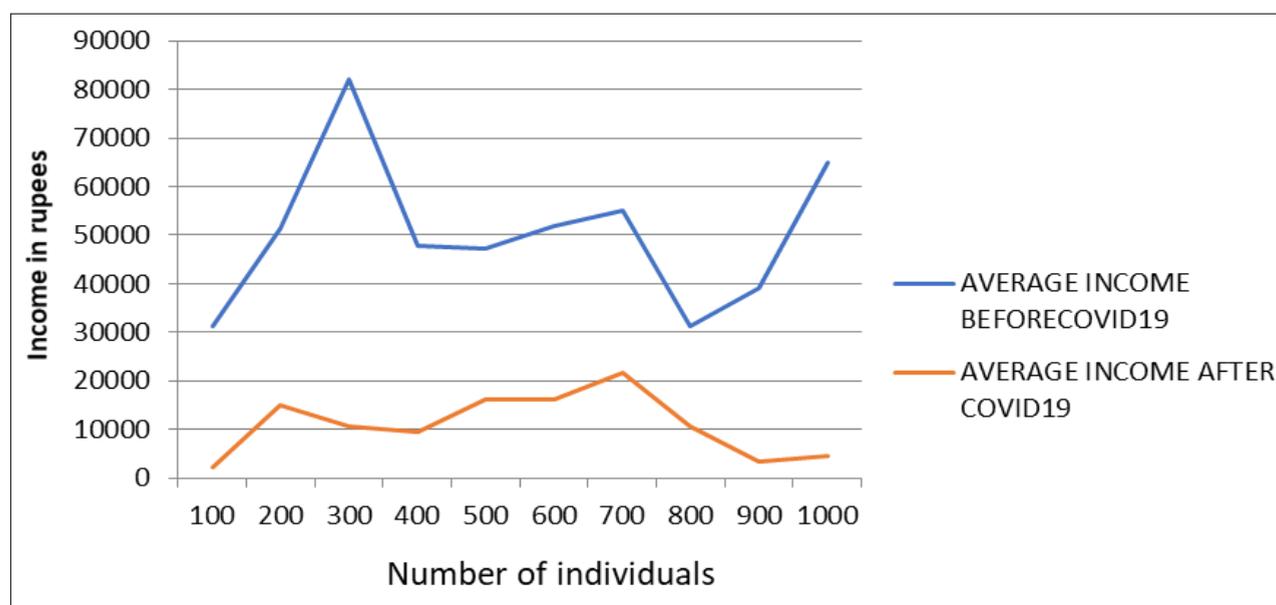


Fig 3 Graphical representation, clearly depicting a huge decline in the farmers' income in the South Indian region, before (blue line) and after (red line) the COVID-19 lockdown

Lack of machinery

Machinery is key equipment in agriculture. Especially in the countries like India, agriculture is one of the major livelihoods. Nowadays mechanization in agriculture is being highly promoted, in order to obtain better results in crop productivity. In the day-to-day agriculture, farmers need a broad range of agricultural machinery viz., tractors, reapers, iron-made hand tools, modern types of equipment like sprinklers, drip irrigation equipment, seed drills, planters, etc. Local made agricultural tools were mostly available but, the automatized Agri machinery should be hired during the cultivating season. Hence in our study, 56% of the farmers were unable to get the required equipment during the cultivation, harvesting, and post-harvest management periods.

Consequences of lack of transportation

As a complete lockdown was imposed on the whole country, no transport facility was available. This has led to a decreased farming routine, consequently, the exports and imports were also declined drastically. Around 89 percent of the respondents were faced problems and difficulty in their agricultural activities due to lack of transport. There was a gradual decrease in the demand during post lockdown periods, because of the accumulated Agri products. A 10% decline in the supply and a 20% fall in the quantity arrivals of vegetables, fruits and oils, due to the reduction in agricultural activities and less transportation [10].

Shortage of electricity, water, and fertilizers

Water supply and power supply are the keys to the cultivation. Governments should guard the farmers by providing uninterrupted electricity and water supply. More than fifty-five percent of the respondents were unable to get

a sufficient supply of power and water. Whereas, fertilizers are also one of the important requirements in farming. The addition of fertilizers would enhance crop productivity; subsequently, the farmer would benefit from an increased income. But, during the pandemic, there was an enormous shortage in fertilizer availability. Only 49% of the respondents were able to get sufficient amounts of required fertilizers.

Agriculture is life

This was the most attention-drawing response that we have obtained in our study. As farmers were facing numerous problems, they were unable to continue their regular agricultural activities. One of the questions in our questionnaire is that “Are you planning to stop agriculture due to all these problems?”. In an astonishing manner, 660 members out of one thousand respondents given the answer as ‘NO’, as shown in Figure 4. This response is a clear evidence of the passion of respondent farmers towards agriculture. By analyzing this response, we can interpret that most of them don’t consider agriculture as their livelihood but as their life.

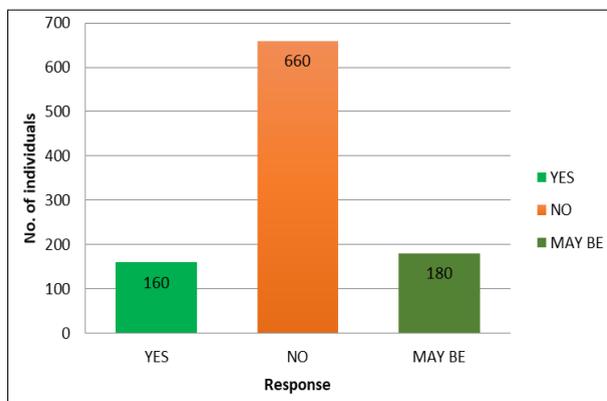


Fig 4 Graph showing the farmers’ opinion on quitting agriculture

Are you getting sufficient food?

A farmer is the creator of the food grains for the world. Unfortunately, many farmers were unable to get enough food for their daily life, in the country. Hence, we asked them that are they getting sufficient food to eat. Twenty-one percent of them were answered ‘NO’, as they are not having sufficient food grains to sustain their lives. This is a highly pathetic condition of the Indian farmers.

Food crisis ahead?

Increasing population leads to an elevated demand for food. As the declined crop productivity is being evident nowadays, there is a chance of the emergence of a food crisis in India in near future. Hence, in our study, we have collected the opinion on the same aspect in which 92% of the respondents were likely to express there would be food crisis arousal in our country.

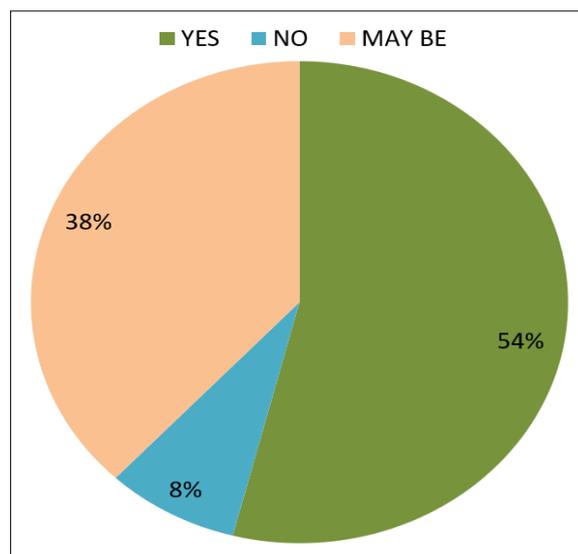


Fig 5 Pie-chart showing the farmers opinion on food crisis in India

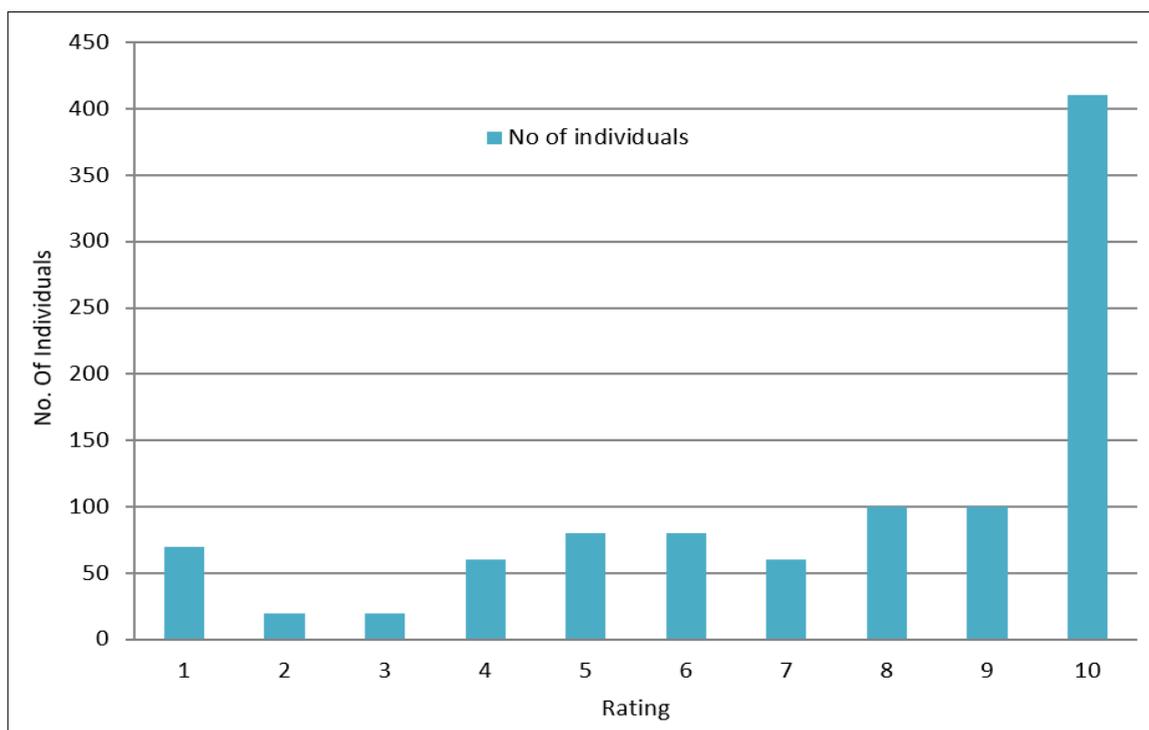


Fig 6 Rating given by the respondents, showing how COVID lockdown have affected their agriculture, on a scale of 1 to 10

Opinion poll

The majority of the respondents were seeking help from the government. Though there were many steps taken by the government, farmers opined that those schemes and measures to be implemented at the root stage. They have also expressed an opinion that it was very difficult to get a reasonable and satisfactory MSP for their crops and crop products.

In order to evaluate the extent that the COVID-19 pandemic lockdown affected agriculture, we have collected the opinion poll from farmers. We have asked them to rate the effect on a scale of 1 to 10 where 1 is less effective and 10 being highly effective.

So far, the available literature was considered, there are very few surveys regarding the effects of lockdown on agriculture, focusing on South India. Some of the researchers identified the steps to overcome the problems arising due to the prevailing conditions. A study has revealed that about 40 crore workers with the informal economy are falling into poverty, due to the pandemic crisis. They also suggested that incentives and wage subsidies could be provided by the government to marginal farmers [12].

Our study was particular in evaluating the pandemic crisis, and its consequent effects on South Indian agricultural sector. In the earlier studies, many researchers have examined the various effects such as changes in agrarian labour relations during pandemic lockdown and also dynamics of capital labour relations in the area of rural Punjab [7]. *Balamurugan et al.* expressed their perspective on COVID-19 lockdown disruptions on water resources, wastewater, and Agriculture in India, by identifying the limitations in the current functioning systems of water resources and the preliminary impacts of COVID-19 on agriculture sector were also discussed as well [1]. In the previous studies, mainly researchers were confined to small regions and also specifically from northern parts of India.

Hence, our study is a remarkable survey, we were mainly focused to examine the impacts in the southern states of India.

CONCLUSION

Thus, we conclude that the present study was mainly aimed to evaluate the effect of COVID-19 pandemic lockdown on the agriculture in South India and prevailing post lockdown conditions, from the farmers' perspective. The global pandemic is a major hurdle for regular agricultural activities. Hence, this study concludes that there was great damage to the agriculture and allied sectors in the South Indian region. There was irrecoverable damage to crop production as well as the economy. Decline in the farmers' income, lack of field level labour, non-availability of farming machinery, and also drastic downfall in the agriculture sector was reported in the above-mentioned five states. Despite all these hurdles 66% of the respondents were willing to continue the agriculture, where as 34 % of the farmers were intended to quit the agriculture. As the COVID-19 has been spreading out, the agriculture sector would face more hurdles in the near future. Hence, the farming community should be strengthened enough to combat the upcoming crisis.

Authors' Note

This work was presented in the International Conference on Agricultural Newness (ICAN-2020), organized by SAGE University, Indore, India, and was awarded third prize in best oral presentations.

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We duly thank the respondent farmers for responding to the survey.

Conflict of Interest

We declare no conflict of interest.

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