An empirical analysis of impact of COVID-19 disruptions on agricultural activities in Nalgonda district of Telangana, India

Abstract

The objective of the study was to provide insights on disruptions faced by farmers due to COVID-19 for harvest of *rabi* (winter*)* crop and preparations for *kharif* (summer) crop and to suggest appropriate policy measures to enable farmers to cope with similar disruptions in agricultural activities. Data was collected from 125 farmers from five tribal hamlets of Deverkonda mandal of Nalgonda district of Telangana state. The major constraints reported by almost all the farmers (99.2%) were financial problems primarily due to loss of wage work, repayment of informal loans (83%), fear of contracting COVID-19 (92%) and health of family members (89%) which adversely affected their work efficiency. Paddy crop was the most affected as rated by 80.8% of the farmers, followed by vegetables 52.8%, groundnut 41.6%, cotton 37.6%, redgram 16.8% and fruit crops(sweet lime) 13.6% respectively. The farmers faced problems in land preparation (92.8%), high cost of inputs (96.8%), and low availability of inputs (75.2%), transport problems to procure inputs (96.8%), labour shortage (67.2%) and storage of unsold produce (75.2%). Shortage of animal feed (79.2%) and health care of animals (85.6%) were the constraints faced in livestock care. The harvesting of paddy was the most affected due to shortage of labour and harvesting machines. Community seed and animal feed banks, collectives like farmer producer organizations, collateral free credit, small packaging of inputs, promotion of youth entrepreneurship in processing ,storage and sale of produce and mechanization of small farms, direct procurement, logistic support are some of the immediate and mid- term measures being suggested for building resilience of food systems to face future risks.

Key Words: COVID-19 disruptions, agricultural production**,** small holder farmers, strategies

Introduction

The impacts of COVID-19 are most likely to have an adverse affect on economies of the world with the World Bank terming it as the biggest economic crisis post World War II (World Bank, 2020). The disruptions due to COVID-19 pandemic may have more adverse effects on the populations already vulnerable to poverty and malnutrition (Laborde et al., 2020; FAO, 2021). The Food and Agriculture Organization (FAO, 2020), states that COVID-2019 has affected both the supply and demand for food severely affecting the food security of the people. In response to the pandemic the Government of India imposed very stringent lockdown for two months (Hale et al., 2020) which unfortunately corresponded with a peak harvest and a pre-sowing stage for most of the crops grown in India. The COVID-19 pandemic has put a great challenge on Indian farmers already burdened with vagaries of rainfall, volatile prices and high indebtedness (Deepa, 2020). In India, agriculture is the source of livelihood for 58% of the population and in 2020, 41.49 percent of the workforce in India were employed in agriculture (O'Neill, 2021). According to FAO (2021), the small holder farmers encountered problems in accessing inputs because of high price, fall in household incomes and also due to lack of availability of inputs in the markets. Similar to the measures imposed by the Government of India, the State of Telangana too implemented the lockdown to curb the spread of COVID 19 in the state. The agricultural operations were exempted from lockdown by the government of Telangana but the unavailability of labour

and harvesting machines affected the operations. In order to override the distress among farmers the government announced to buy the entire crop of paddy and cotton by opening procurement centres in the villages (livemint, 2020). There is an urgent need therefore to assess the risks, immediate, short and long term effects of COVID-19 induced disruption on agriculture.

The main objective of the present study was to provide insights on disruptions faced by farmers due to COVID-19 on agricultural activities and to suggest suitable measures to safeguard the small holder farmers to cope with similar challenges in agriculture.

Methodology

The data for the present study is based on a survey conducted between October to December 2020. A multi-stage sampling technique was used for the selection of farmers with purposive selection of district and random selection of farmers. In person data collection from farmers during COVID-19 was possible as outreach programs were being implemented by ICAR-Indian Institute of Rice Research (IIRR) in Deverkonda mandal of Nalgonda district. The Nalgonda district of Telangana has good irrigation sources and favourable climatic conditions and approximately 75% of population depends directly or indirectly on agriculture in this district. Paddy and Cotton are the major crops grown in this district. (https://nalgonda.telangana.gov.in/agriculture) Data was collected from 125 farmers, 25 each from five tribal hamlets (*tandas*) *Viz* (*Kommepally, Boddupalle, Jarpula Tanda, Jal Tanda and Gurapu Tanda*) of Deverkonda Mandal in Nalgonda District of Telangana State.

Data were collected on the demographic and farm characteristics, employment status and risk management strategies like crop insurance. Information on the constraints faced by farmers due to COVID-19 pandemic was collected on aspects such as, harvesting of *rabi* (winter) crops of 2019-2020, sowing of *kharif* (summer) crops of 2020, access to farm inputs, marketing of farm produce, impact on livestock, transport and storage of produce. Problems on the family front in fear of contracting COVID-19, fall in income, high cost of food supplies, transport/commuting problems of family members were also elicited.

A mixed method study design was employed with primary data collection from farmers and a desk review of the policy measures to curb the adverse effects of COVID-19 on farming activities by the Telangana Government. The objective of the study was to provide insights on disruptions faced by farmers due to COVID-19 for harvest of *rabi* (winter*)* crop and preparations for *kharif* (summer) crop and to suggest appropriate policy measures to enable farmers to cope with similar disruptions in agricultural activities.

Results and Discussion

The socio-demographic features of the respondents indicate that nearly 40% of them were illiterate (38.4%) followed by primary schooling (11.2%),ten years of schooling (24%),two years of study post high school(16%),graduates (8.8%) and post graduates(1.6%).Farming experience of the respondents ranged from below 5 years(12.8%),6-10 years(16%),11-20 years(33.6%) and more than 20 years for 37.6%. Nearly 60% of the farmers had a semi medium farm size, followed by small 28.8%, medium 5.6%, marginal 4.8% and only 1.6% had large farm size. Farming along with wage work was the occupation of majority of the farmers (56%) followed by farming alone (20.8%), small business (16%), other wage work (4.8%) and farming with employment for 2.4% of the farmers. A large majority of the farmers were maintaining livestock (85.6%) and only 14.4 percent did not own livestock. With regard to family type, 51.2% of the respondents were having nuclear family set up and the rest had joint family (48.8%). Though several avenues for institutional loans are available, it was observed that majority of the farmers were depending on informal sources for loan (79.2%), followed by 5.8% availing loans from

formal sources, whereas, 12% were not availing any loans at all. Crop insurance offers a safety net during disruptions in crop season but it in the study area only 56.8% farmers had availed crop insurance service and the rest did not avail this service.

Impact of COVID-19 on agricultural activities

The challenges faced by farmers due to the COVID -19 disruptions on the agricultural activities was elicited on aspects of crop production,availability of inputs ,labor shortage, ,livestock management and effect on health and well being of family members.

Constraints faced due to COVID-19 for rabi crops

The period of lockdown announcement i.e. March to May 2020, was the peak growing season of *rabi* (winter) crops in the study area as similar to many states of India and crops like paddy and cotton were at the harvesting stage. Therefore, a vast majority of the farmers faced problems at the time of harvest (91.5%) majorly due to unavailability of labour (69.4%), for their self transport (50.6%) and transport of produce (63.0%) to home and markets. Vikas et al, (2020) have also reported constraints faced by farmers in transporting produce to markets. Moreover, agricultural produce is mostly perishable in nature and 92.8 % of the farmers reported loss due to spoilage and moreover, about 80% reported that they were compelled to hold unsold produce for a longer period.

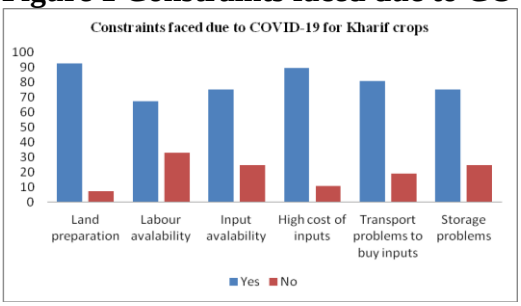
Availability of inputs and labour

The seeding stage of the major crops had been completed prior to the lockdown and thus the non-availability of inputs was not a major constraint perceived with respect to seeds (31.2%), fertilizer (24.8%) and pesticides (24.8%). On the other hand, high cost and non availability of harvesting equipment was a major constraint reported by farmers (74.1%).Non-availability of harvesting equipment has also been reported by other researchers (Bhavani, 2020; Sharma, 2021). Limited availability of labour was a major constraint reported by FAO (2020); Jefferson et al, (2020); Mahendra (2020) and Sharma (2021). Labour shortages at harvesting time of rice, production loss and short supply of rice to the markets have been reported by Nnaemeka (2020) and Jefferson et al, (2020).

Constraints faced due to COVID-19 for kharif crops

It can be observed from figure 1, that farmers faced problems in land preparation (92.8%), high cost of inputs (96.8%), low availability of inputs (75.2%), transportation problems to purchase inputs (96.8%), labour shortage (67.2%) and storage of unsold produce (75.2%).

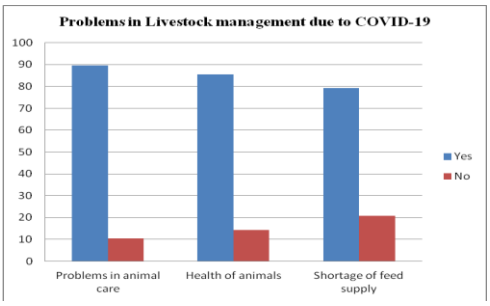
Figure 1 Constraints faced due to COVID-19 for kharif crops



Impact of COVID-19 on livestock management

Allied agricultural sector such as livestock care (figure 2) has been affected by the pandemic as reported by majority(89.6%) of the farmers followed by problems in health care of animals (85.6%) and shortage of animal feed(79.2%) triggered by the restrictions in the transport sector. Nesrein et al, (2020) have reported the severe impact of COVID-19 on the livestock sector, A constraint in accessing feed for livestock has also been reported by Zhang (2020).

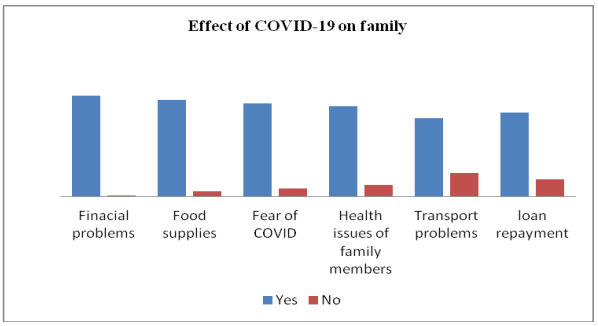
Figure 2. Problems in livestock management due to COVID-19



Impact of COVID-19 on family welfare

` From figure 3 it can be inferred that financial problems were the major constraint reported by almost all the farmers (99.2%) due to loss of wage work. Since most of the respondents in the study were employed in wage work along with farming loss of income was the most severe impact of COVID-19. Loss of job and decrease in incomes has been reported in several surveys (Arun, 2020; Cariappa et al., 2020; Imbert, 2020; Ray, 2020; PIB, 2021). Food supplies were also affected as reported by 95.2% of the farmers. FAO (2020) states, that the negative impact of COVID- 19 has been severe on food security of the people. Repayment of informal loans was the major issue on minds of most of the farmers (83%) as the fresh loans for the ensuing season are mostly provided on repayment of the loans taken earlier. Fear of contracting COVID-19 (92%) and health of family members (89%) weighed heavily on the minds of farmers affecting their work efficiency.

Figure 3.Impact of COVID-19 on family welfare



Impact of COVID-19 on different agricultural crops

It can be observed that paddy crop was the most affected as rated by 80.8% of the farmers, followed by vegetables (52.8%), groundnut (41.6%), cotton (37.6%), redgram (16.8%) and fruit crops(sweet lime) (13.6%), respectively. The *rabi* (winter crop) crop of paddy starts in the month of November and continues up to May in Telangana State. The farmers' thus faced constraints during the peak harvesting stage of paddy as the lockdown was implemented from end of March 2020 and further extended till May 2020. Moreover, in Telangana, the duration of the *rabi* crop is extended even up to one month depending on the intensity of cold at vegetative stage, thus the harvesting of paddy was the most affected due to shortage of labor and harvesting machines. As most of the smallholder farmers hire the services of harvesting machines the shortage of machines and labor was a severe constraint faced by farmers also reported by Deepa (2020). An emerging need for mechanization of smallholder farms by using mini-tillers, planters, harvesters and other labor-saving equipment

is to be addressed. Mechanizing the sowing and harvesting operations will help to minimise similar risks in the future (Grant, 2020).

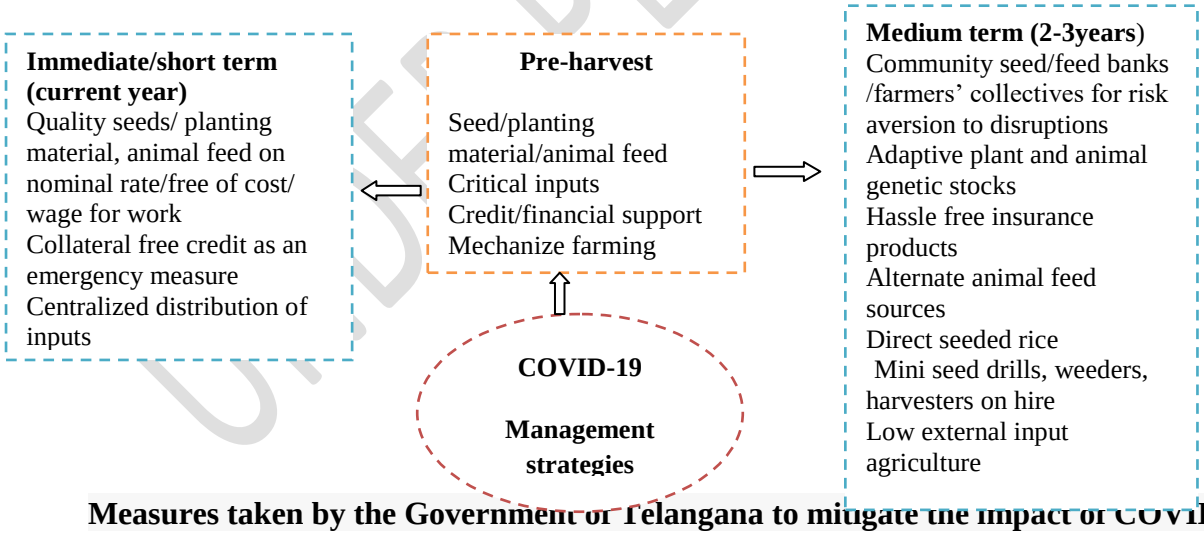
Table 1: Impact of COVID-19 on different agricultural crops as rated by farmers (n=125)

S.no	Crop	Constraints faced (Percentage)	Rank
1	Paddy	80.8	1
	Vegetables	52.8	2
2	Groundnut	41.6	3
3	cotton	37.6	4
3	Redgram	16.8	5
6	Fruits(sweet lime)	13.6	6

Strategies/measures to reduce disruptions to agricultural sector

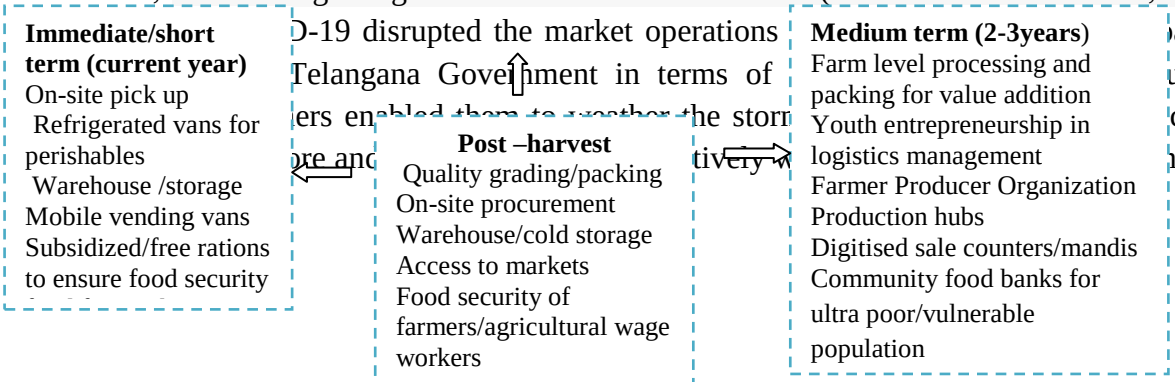
The following short and medium term measures are being suggested to enable , policy makers to design appropriate strategies to help farmers cope with disruptions to the agricultural sector in the future.

Figure 4: Measures to reduce COVID-19 disruptions to agricultural activities



Measures taken by the Government of Telangana to mitigate the impact of COVID-19

The agriculture sector in Telangana State grew by an impressive 20.9 per cent in 2020-21, contributing a higher share to the overall GSDP (Socio-economic outlook, 2021). D-19 disrupted the market operations active Telangana Govelment in terms of ultural ers enabled them to weather the storm cotton ore and tively ment in



2020-2021 (as of 1st March 2021), through a coupon system in the procurement centres for safe sale of produce which helped the farmers enormously in mitigating the impact of COVID-19 (Socio-economic outlook 2021). Moreover, perishable produce (vegetables and fruits) were sold through mobile vans and the registration of farmers to sell their produce online enabled them to sell at a higher rate than regular market rate. These policy measures helped to maintain the agricultural production during COVID-19 but nevertheless the farmers faced constraints due to lack of access to markets to procure inputs and shortage of labour and harvesting machines.

Similar measures have been suggested by FAO (2021) to overcome the disruption in agricultural sector due to COVID-19 viz. setting up of procurement centres closer to producers, receipt system for storage in warehouse, ease in movement of seasonal agricultural workers, transport of produce and setting up of large market yards with best facilities to maintain high standards of quality and food safety.

Conclusion

The COVID-19 disruptions are all pervasive affecting the human health and also the agricultural sector and may cause severe food insecurity, economic slowdown and increase poverty. The COVID-19 induced disruptions were majorly felt for harvest of crops and sowing for next season. Farmers faced constraints due to labour shortage and unavailability of harvesting machines, high cost of inputs, logistic issues to transport produce and procure inputs. Fall in income, repayment of loans, fear of contracting COVID-19 and health of family members were the problems faced at the personal front. Building the resilience of the farmers both at pre and post harvest stages through community seed and feed banks, cash and food transfers, credit, direct procurement, online sale of produce, custom hiring of planting/harvesting equipment, logistic support are some of the measures suggested to face future risks to agriculture.

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