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An Analysis of Impact of COVID-19 on Agriculture, Horticulture Crops and Livetocks in Krishna District, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The current study was carried out in Krishna District of Andhra Pradesh. Krishna district mainly agrarian district. The major agricultural crops grown in the district are paddy, cotton, Maize, blackgram, greengram, sugarcane, Groundnut Similarly, horticultural crops are chillies, mango, turmeric and buffalos, cows, sheep and goat are the major livestock population in the district. The impact of COVID-19 severely affected the supply chain of various crops that leads to decreases in the prices of various crops. By keeping in the view the present study was selected with an aim to

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assess the impact of Covid-19 in the Krishna district. The objectives of the study were impact of COVID-19 in agricultural, horticultural and livestock sector, post lock done preparedness of farmers in production and marketing aspects and constraints faced by farmers during Covid -19 in agriculture and allied sectors. An *Ex Post Facto* research design followed for the study. The structured interview schedule was prepared for the study and a total of 60 respondents were selected randomly from six villages of three mandals. Mean, median, frequency and percentage used for data analysis. The findings of the study were impact of covid-19 on production was (8.33%) in agriculture crops, (28.33%) in horticulture crops and (35.00%) on live stock. Covid-19 impact on Farm gate prices was (25.00%) on agriculture crops, (86.70%) on horticulture crops and 21.66% on live stock. Whereas impact on availability of inputs in agriculture is (20.00%), horticulture was (23.33%) and livestock was (28.33%) and on labour availability it was 68.33% in agriculture, 80% in horticulture and 40% in live-stock. Farmers during COVID-19 were lack of labour availability, farm labour is huge demand and very costly, market sale prices very less for produce and no marketing facility and cost of cultivation is high are the important constraints faced by the farmers. The study useful to policy makers to understand the impact of the pandemic on agrarian sector.

Keywords: *Impact; COVID-19; constraints; ex post facto; agriculture crops.*

1. INTRODUCTION

“The novel Corona virus (COVID-19) pandemic has rapidly spread across the world, adversely affecting the lives and livelihoods of millions across the globe. India has reported its first infection on 30 January 2020, prompting the authorities to soon initiate various measures to contain the spread of the epidemic. Given that disease is highly contagious; the much needed nationwide lockdown was enforced starting 25 march 2020 in order to contain the spread of covid-19 pandemic” [1]. “During the initial few weeks, the restrictions were strict and all non-essential activities and businesses including retail establishments, educational institutions across the country were prohibited from operating. Subsequently these restrictions are being gradually eased in phased manner in most parts of the country. While other sectors are reported to be under significant stress, it is important to analyse the impact of Corona virus on agriculture and allied sectors which provide livelihood to majority of the population in India. The agricultural and allied sector carries immense importance for the Indian economy. It contributes nearly 16% to the Indian economy and provides employment to nearly 50% of the work force” [2]. When there is an outbreak of infectious disease, there is also an increase in hunger and malnutrition [3-5]. “It is fundamental of for ensuring food security of the nation and also influences the growth of secondary and tertiary sector of the economy through its forward and backward linkages. The performance of agricultural sector greatly influences achievements on many other fronts” [6].

Agricultural growth reduces poverty directly, by raising farm incomes, and indirectly, through generating employment and reducing food prices. In other words, a thriving agricultural sector is a boon for most sectors of the Indian economy. According to Adeeth Cariappa et al. [7] “the results of a 10 point strategy on mitigating the corona virus disease 2019 (COVID-19) on agriculture revealed that usage of social networking applications in the first phase of the nation-wide lockdown and in mitigating productivity losses and in overcoming market constraints. Although, India is one of the largest producer of some of the agriculture and horticulture products. Yet, the national yield of major crops is less than the global average yield production. Further, the national yield of such crops is for less than the highest yield achieved in other parts of the world. The COVID-19 pandemic has adversely impacted the global agriculture and Indian agriculture sector is no exception”. During the lockdown, the agriculture sector had functioned smoothly. Government of India has taken all necessary measures to ensure smooth operation of agriculture related activities. Farming and allied activities were exempted from the lockdown. Seed, pesticide, fertilizer etc. dealers / shops and other input related activities were allowed to open / free for making inputs available to the farmers. Inter and intra state movement of farm machinery specially combine harvesters was facilitated. As a result of the various steps taken by the Department, both harvesting activities of the Rabi Crop and sowing activities of Summer Crop took place in a systematic manner. However, no income assessment report which estimates the impact of

Covid on the income of small and marginal farmers due to nation-wide lockdown is available [8].

Agriculture and Allied Sectors registered a growth of 3.4% during 2020-21 even as the overall economic growth declined by -7.2% during the same period. Growth rate of Agriculture and Allied sectors during the last 5 years are given below (Press Information Bureau, GOI Ministry of Agriculture & Farmers Welfare).

1.1 Research Objectives

Keeping in this view the present study named as "An Analysis of Impact of COVID-19 on Agriculture, Horticulture Crops and Livestocks in Krishna District, India" with following objectives.

1. To study the Impact of COVID-19 on Agriculture Field, Horticultural Crops and Livestock/Poultry.
2. Post Lock Done Preparedness of Farmers in Production and Marketing Aspects.
3. Constrains faced by farmers during COVID -19 in agriculture and allied sectors

2. MATERIALS AND METHODS

The current study was carried out during 2022 impact of Covid-19 Krishna district of Andhra Pradesh. The data was collected through well structured interview schedule. An *Ex Post Facto* design followed for the study. *Ex Post Facto* Research design is a method in which groups with qualities that already exist are compared on some dependent variable. Also known as "after the fact" research, an ex post facto design is considered quasi-experimental because the subjects are not randomly assigned - they are grouped based on a particular characteristic or trait. A total of 60 respondents were selected for the study. In Andhra Pradesh, Krishna district was selected based on cultivation of agricultural, food and livestock. In Krishna district Nandigama, Jaggyapeta and Kanchikacherla mandals were selected for the study.

Two villages were randomly selected from each mandal and a total of six villages from three mandals were selected. From each selected village ten respondents were randomly selected thus making a total of 60 respondents. Primary data used for the study, the data was collected by researcher. The descriptive

statistics tools like such as, Arithmetic Mean, frequency distribution and percentage used for the study.

2.1 Statistical Tools used for Analysis of Data

The following statistical tests and measures were used for the analysis of the data.

2.2 Arithmetic Mean

It is defined as the sum of the observations divided by its number. Arithmetic mean was used for categorization of respondents on all the profile characteristics of the study.

$$\bar{x} = \frac{\sum x}{n}$$

Where,

\bar{x} = Mean

$\sum x$ = sum of scores

n = Number of respondents

2.3 Frequencies and Percentages

Frequency and percentages were used to know the distribution pattern of respondents according to objectives under study. Percentages were used for standardization of sample size by calculating the number of individuals that would be under a given category, if the total number of cases were hundred. Frequency was represented by 'n' and percentage was represented by '%' in the results of the study.

3. RESULTS AND DISCUSSION

From the Table 1 it could be concluded that Impact of COVID-19 on agriculture and horticulture crops livestock/poultry Krishna district of Andhra Pradesh were 5 respondents (8.33%) decline in production of agriculture, decline in horticulture and 35.00 declines in production of livestock. In agriculture crops 25.00 per cent decline in farm gate prices followed by 86.66 per cent decline in horticulture crops. In marketing majority 76.66 per cent of the farmers faced lack of marketing facilities in agriculture crops, followed by 95.00 per cent in marketing of horticulture produce and 53.33 per cent of the farmers faced problems marketing of livestock produce. Impact of COVID-19 on Farming activities in Krishna district of Andhra Pradesh revealed that agriculture production 8.33 had not

been adversely impacted significantly, mainly due to the fact that harvesting of rabi crops was almost complete by the end of April 2020. However, production in allied sector had declined significantly, especially in Livestock/poultry sector (35.00%) primarily due to drastic decline in demand for these products possibly due to the widespread fear circulating in the wake of COVID- 19 regarding safety of non-vegetarian food, particularly poultry. Similarly, production in horticulture crops (28.33%) also reduced, owing to reduced demand for these products and disruption in their supply chain. Impact on Farm Gate Prices: Farm gate prices have shown one-fourth decline in agricultural crops (25.00%). Mainly due to supply disruption caused by restriction on movement of vehicles and closure of Agriculture Produce Market Committees (APMCs).

Impact on availability of Agri Inputs: Due to restrictions imposed on movement of men/material and closure of shops, availability of agri inputs viz. seeds, fertilizers and insecticides. **Impact on Prices of Agri Inputs:** - Due to disruption in supply chain owing to restrictions on movement of vehicles and closure of shops and markets, prices of agri inputs viz. Impact on Agriculture Marketing –Even though local procurement centres were opened by various

State Governments under their jurisdiction, yet restrictions on movement of vehicles.

Impact on agricultural Labourers availability:

Due to disruption in supply chain owing to restrictions on movement men and vehicles 68.33 per cent labour shortage witnessed in agriculture crops followed by 80.00 per cent in horticulture crops and 40.00 per cent livestock activities.

From the Table 2 it could be concluded that 51.66 per cent them were dependence on social media platforms (WhatsApp, YouTube, Face book etc.,) dependence on social media for production aspects and 78.33 percent on them were on marketing aspects. Similarly 30.00 per cent of them were on production aspects and 21.66 per cent were on marketing aspects interaction with ANGRAU Scientists (RARS/KVK/DAATTCS/DOA/ICAR).

From the which Table 2 it could be concluded that 40.00 per cent on marketing and 53.33 percent them were production aspects form the farmer producer organization. 38.33 productions Interest in new technological advances to mitigate the COVID-19 pandemic Professional communication preparedness 21.60 per cent in production and 43.33 per cent marketing aspects.

Table 1. Impact of Covid-19 on agriculture field, horticultural crops and livestock/ poultry (n =60)

S. No	Parameter	Agricultural crops		Horticulture crops		Livestock/Poultry	
		F	P	F	P	F	P
1	Impact on Production	5	8.33	17	28.33	21	35.00
2	Impact on Farm gate prices	15	25.00	52	86.66	13	21.66
3	Impact on marketing facilities	46	76.66	57	95.00	32	53.33
4	Impact on Availability of Agri inputs	12	20.00	14	23.33	17	28.33
5	Impact on agricultural labourers labour availability	41	68.33	48	80.00	24	40.0

F – Frequency, P – Percentage, Source : Research Finding (2023)

Table 2. Post lock done preparedness of farmers in production and marketing aspects (N = 60)

Component	Production		Marketing	
	F	P	F	P
Dependence on social media platforms (WhatsApp, YouTube, Face book etc.,)	31	51.66	47	78.33
Interaction with ANGRAU Scientists (RARS/KVK/DAATTCS/DOA/ICAR)	18	30.00	13	21.66
Formation of FPOs	24	40.00	32	53.33
Interest in new technological advances	23	38.33	-	-
Professional communication	13	21.6	26	43.33

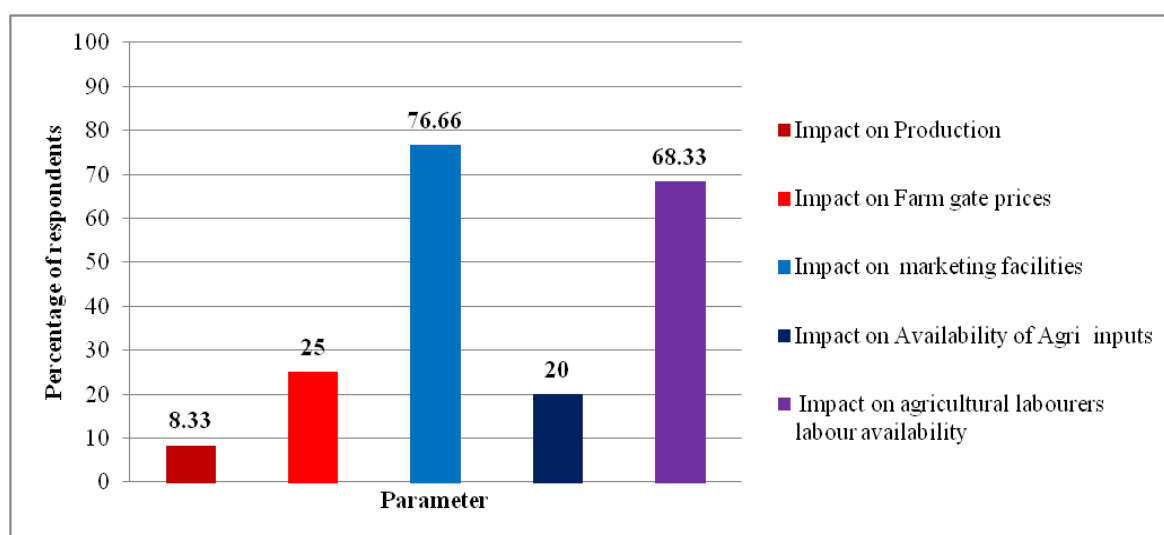


Fig. 1. Impact of Covid-19 on agriculture crops

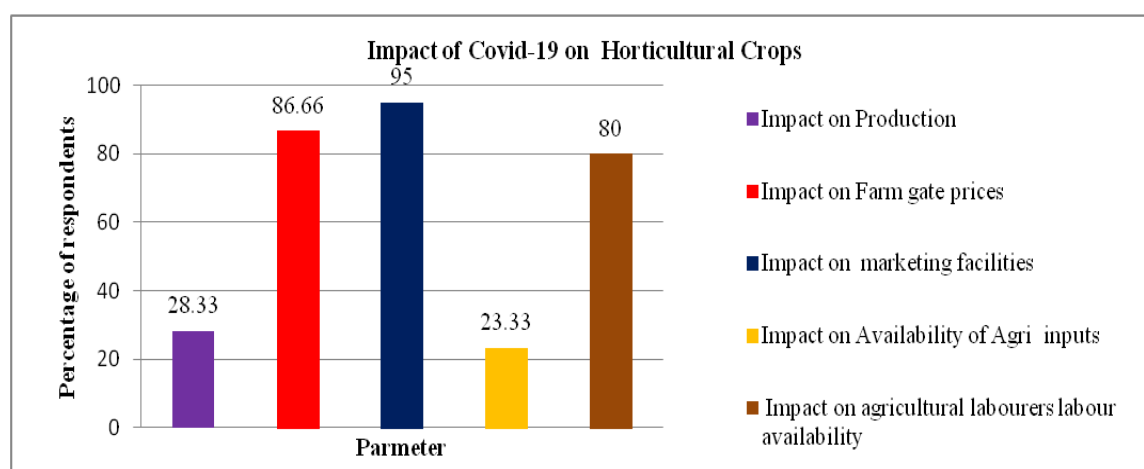


Fig. 2. Impact of Covid-19 on horticultural crops

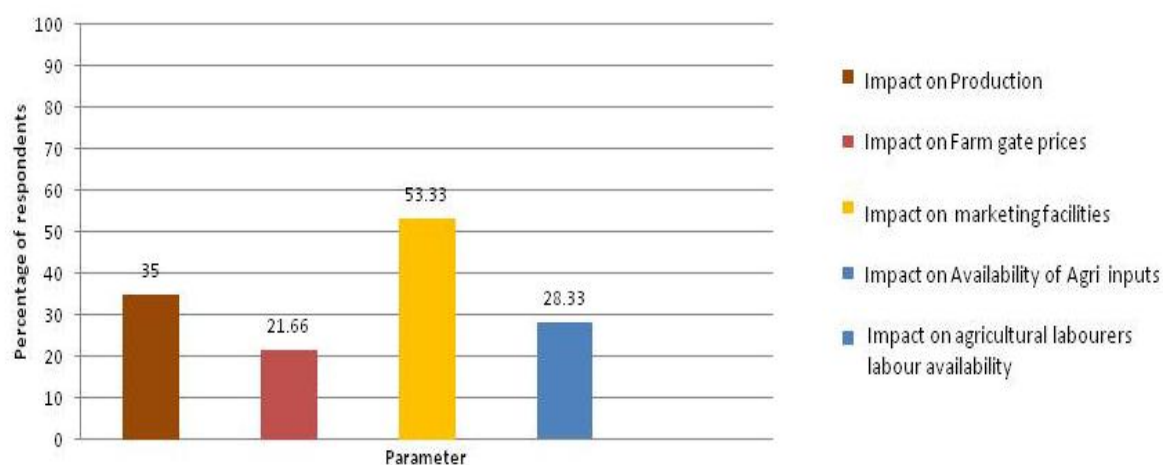
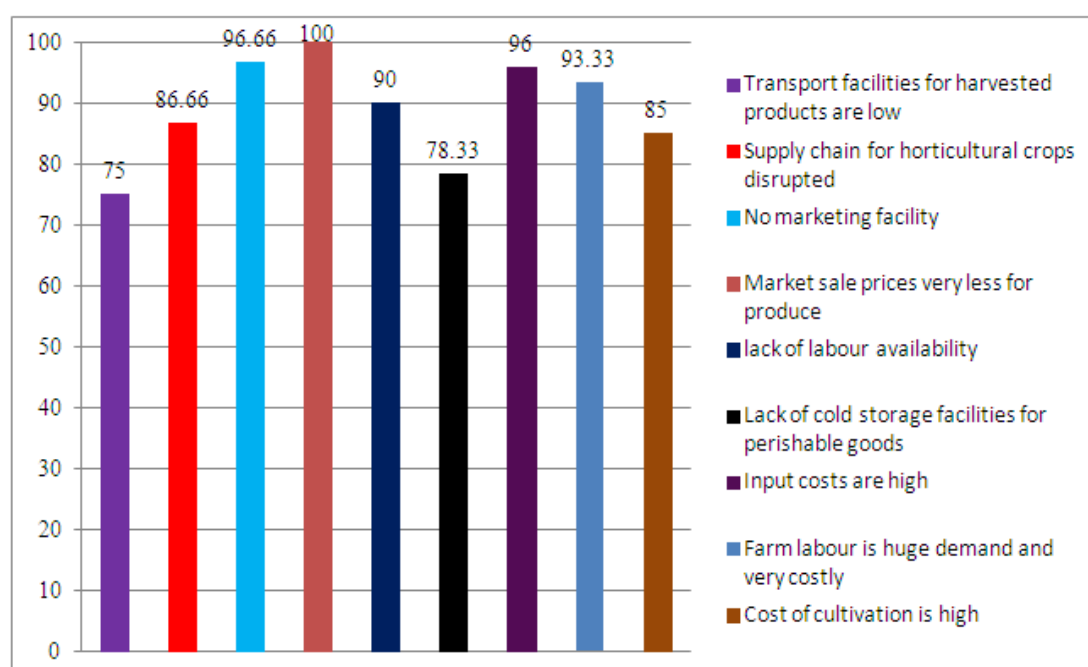


Fig. 3. Impact of Covid-19 on Livestock/poultry

Table 3. Constrains faced by farmers during COVID -19 in agriculture and allied sectors (n=60)

S. No	Constraints	Frequency	Percentage
1.	lack of labour availability	54	90.00
2.	Farm labour is huge demand and very costly	56	93.33
3.	Market sale prices very less for produce	60	100.00
4.	No marketing facility	58	96.66
5.	Cost of cultivation is high	51	85.00
6.	Transport facilities for harvested products are low	45	75.00
7.	Input costs are high	48	96.00
8.	Lack of cold storage facilities for perishable goods	47	78.33
9.	Supply chain for horticultural crops disrupted	52	86.66

**Fig. 4. Most important constraints faced by the agricultural and horticultural sectors**

From the Table 3 and Fig. 3 it could be concluded that the most important constraints faced by the agricultural and horticultural sectors during the covid-19 pandemic were cenet percent market sale prices very less for produce followed by (96.66%) were no marketing facility for agricultural, horticultural and livestock, input costs are high (96.00%), farm labour is huge demand and very costly (93.33%), lack of labour availability (90.00%), supply chain for horticultural crops disrupted (86.66), cost of cultivation is high (85.00%), lack of cold storage facilities for perishable goods (78.33%) and Transport facilities for harvested products are low (75.00%). This is because of during the COVID-19 situations the total supply chain was damaged and the transport was banned inter and intra states, districts that all affected by the cost of produce and also lack of inputs.

4. RECOMMENDATIONS OF STUDY

4.1 Recommendations to the Study

1. Government should boost the agricultural sector by giving the input subsidies
2. Arrange proper cold storage facilities to the agricultural commodities
3. Provide regional, mandal and village wise cold storages
4. Create more effective market information system
5. Avoid middlemen's during the pandemic situations
6. Government should interfere to reduce the price for inputs
7. Prepare well advance to avoid the situations in future

8. Formation of farmer producer organizations strengthen the marketing channels

4.2 Recommendations to the Future Researchers

1. The present study had the limitation of the time and resource of single investigator with a sample size of 60. Hence, a comprehensive study with large size sample covering farmers who are affected by the covid-19 can be taken up for in depth study and for wide application of results.
2. Only three Mandals from Krishna district of Andhra Pradesh state were selected for the study due to certain limitations. It is necessary to have studies in larger areas in order to generalize the findings.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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