



IMPACT OF COVID-19 ON AGRICULTURE IN CHITTOOR DISTRICT OF ANDHRA PRADESH

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ABSTRACT

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COVID-19 impact has led to severe and widespread increase in global food insecurity, affecting vulnerable households in almost every country. The pandemic is worsening day by day, causing disruption in human activities, a high mortality rate toll and a direct economic impact. The study analysed the impact of COVID-19 on farmer households' income in Chittoor district of Andhra Pradesh. The necessary data was collected from the respondent farmers via pretested schedule. Multiple linear regression analysis was used to identify factors that influence covid-19's impact on farmers. The results showed that COVID, farm size, livestock possession and yield were found significantly determine the income of the farm households. Paired t test and difference in difference analysis were used to analyse impact of COVID-19 on farmer households. The results show that a medium farm household lost an average of ₹ 96,848 per farm household per year, followed by marginal farmer with ₹ 29,299 and small farmers with ₹ 1,992 per household per year. Over all the decline in income of farmers is around 52 per cent and significant impact of COVID-19 on farmers income is seen. The major implication of the study is to find the mitigation actions against such disasters if further faced in future.

KEYWORDS: Impact, COVID-19, Households income.

INTRODUCTION

The economic impact of a pandemic is multidimensional. The globe is currently gripped by such a pandemic, known as COVID-19, is currently sweeping the globe and serves as a harsh shock by upending many assumptions. The shock it caused is unprecedented and almost no industry is unaffected or spared by this pandemic. All sectors ranging from education to tourism, agriculture to luxury are all affected in some manner and the virus has no obstacles to cross international borders, by this the globe seems unable to share the risk. As rightly put by Maliszewska *et al.* (2020), what is started as a local shock in China has now become global shock, leaving the world in "medically induced coma" (Lemieux *et al.*, 2020). In the commodities and labour markets, an economic shock is often examined from both the supply and demand sides. Such an examination during the time of COVID-19 will give us with a gloomy vision of languished industry and reduced economic activity. Understanding the extent of a combined demand and supply shock, in which the economy is affected by lower demand for and supply of products, services, and even labour, is critical for making sound policy decisions. It was anticipated that COVID-19, which has brought about unprecedented labour market shock and unemployment crisis, would produce more disruption in sectors and occupations than the 2018 financial crisis. According to the International labour Organization 2020, worldwide working hours decreased by 4.5 per cent (equal to 130

million full-time employment) in the first quarter of 2020 and by 10.5 per cent in the second quarters. Researchers from all across the world have previously studied the economic ramifications of job losses and shuttered enterprises.

Moreover, the Chittoor region was found to be reporting a large number of COVID-19 cases in Andhra Pradesh as per data available in COVID-19 ArogyaAndhra portal of government of Andhra Pradesh. Apart from this, a study about impact of COVID-19 on income loss of people belonging to Chittoor region becomes relevant as majority of people in this region depend on the foreign remittance and agriculture for their livelihood. Thus, it is presumed that mobility restrictions and lockdown measured adopted by different countries of the world to arrest the spread of virus have greatly affected the lives of the people in this region as there are a large number of people working across the globe.

MATERIAL AND METHODS

In India, Andhra Pradesh state was selected purposively for present research study. 26 districts spread across the 3 regions- Uttaraandhra, Costal Andhra and Rayalaseema, in the first stage, out of 8 districts in Rayalaseema region, 1 district was randomly selected, Viz Chittoor district. From Chittoor district, 2 mandals were selected randomly, Viz Chandragiri and Ramachandrapuram mandals, this was followed by a random selection of 2 villages from each mandal. Two

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villages with primary occupation as agriculture and allied sector and also COVID-19 affected area were selected randomly from each mandal, thus making a total of four villages selected for the present study. From Chandragiri mandal, Gangudupalli and Panapakam villages were selected, from Ramachandrapuram mandal C. Ramapur and Sorakayalapalem villages were selected. From each selected village fifteen farm households who were affected with COVID-19 pandemic in first phase and fifteen farm households who were not affected with COVID-19 pandemic were selected randomly, thus making a total of 120 farmers for collecting the necessary information related to the objectives of the present research study.

Data analysis

The socioeconomic characteristics of the paddy farmers during the COVID-19 pandemic were examined using percentages, descriptive statistics, and simple averages. In order to shed light on the research study and enable a meaningful interpretation of the findings, averages and percentages were calculated. In order to show the impact of COVID-19 on respondent farmer households' income, paired t test was used and across groups and along the time, to assess the COVID-19 impact on income difference in difference analysis was used. Multiple linear regression analysis was used to analyse the variables/ factors that influence COVID-19's impact on farmer households.

RESULTS AND DISCUSSION

Income and employment details of the respondents

In order to assess the combined effect of COVID on farmers income, paired t test was used and the results show the significant reduction in income from crop, livestock and non-farm compared to off-farm in both COVID affected and not affected farmer respondents and was also seen that there is 50 and 43 per cent decline in

the total income of the COVID affected and not affected respondents respectively in COVID year. By this we can state that there was significant effect of COVID on the farmer household respondent's income. The net income loss incurred by the farmers was 80 per cent and 70.50 per cent in COVID affected and not effected respondent farmers respectively in COVID year.

Impact of COVID on income of farmers across land sizes

Impact of COVID on income of farmers across land sizes i.e., marginal (<2.47 acre), small (2.5-4.9 acre) and medium (5-10 acre) were analysed using the Difference in Difference analysis and result is presented in Table 1. It can be observed that the estimate derived in the first differences demonstrated the difference between farm households' incomes during a previous normal year and a COVID year (₹ 2,73,630, ₹ 4,66,047, ₹ 3,75,850 for marginal, small and medium category farmers respectively) and between COVID affected and not affected farmer respondents' incomes (₹ 72,345, ₹ 2,00,228, ₹ 1,74,832 for marginal, small and medium category farmers respectively), respectively. The double difference was done in between initial differences and result states that medium farm household lost an average of ₹ 96,848 per farm household per year, followed by marginal farmer with ₹ 29,299 and small farmers with ₹ 1,992 per household per year. The results are in line with the findings of Nandi *et al.*, (2021); Ceballos *et al.*, (2020).

Impact of COVID on income of farmers

The income variations brought on by COVID were quantified and understood using the Difference in Difference analysis, estimations were made and the result is presented in Table 2. Results state that the estimate derived in the first differences demonstrated the difference between farm households' incomes during a previous normal year and a COVID year (₹ 3,18,982)

Table 1. Impact of COVID on income of farmers across land sizes (₹/household/year)

S. No.	Variable	Coefficients		
		Marginal	Small	Medium
1	Constant	648684**	1064651**	1344850*
2	COVID	-72,345	-2,00,228	-1,74,832
3	Year	-2,73,630**	-4,66,047*	-3,75,850
4	COVID*Year	-29,299	-1,992	-96,848

Table 2. Impact of COVID on income of farmers

Variable	Coefficients
Constant	7,39,211***
COVID	-19,164.3
Year	-3,18,982***
COVID*Year	-53540.5

* Significance at 10%

** Significance at 5%

*** Significance at 1%

and between COVID affected and not affected farmer respondents incomes (₹ 19,164.3), respectively and the difference of initial two differences, the estimate represented by this double difference was 53,540 per farm household per year. Numerically there is decline in income of farmers but COVID has more or less has shown no significant effect on the income of the farmers. The results are in line with the findings of Gatto and Islam, (2020).

Determinants of farm income of farm household during a COVID year

The findings of the multiple linear regression show how important farm size and other socio-economic factors are to farm households' income during the COVID year. The COVID, farm size, livestock possession and yield were found significantly determine the income of the farm households. In this also yield was significant at

10 per cent, COVID was significant at 5 per cent, farm size and livestock possession were significant at 1 per cent level of significance. The non-significant variables include age, education, and membership in organization. 'R²' value was 0.39 depict that all selected eight variables put together explained about 39 per cent variation in the impact of COVID on income of the farmer respondents. The results are in line with the findings of Yusuf *et al.* (2021); Tu *et al.* (2018); Asante-Addo *et al.* (2017); Mohammadi *et al.* (2015); Bansal (2021); Hara *et al.* (2020); Lin and Zhang (2020); Lynda *et al.* (2020) and Tran *et al.* (2020).

The significant reduction in income from crop, livestock and non-farm compared to off-farm in both COVID affected and not affected farmer respondents and we can also see that there is 50 and 43 per cent decline in the total income of the COVID affected and not affected respondents respectively in COVID year. The net income loss incurred by the farmers was 80 per cent and 70.50 per cent in COVID affected and not effected respondent farmers respectively in COVID year. Medium farm household lost an average of ₹ 96,848 per farm household per year, followed by marginal farmer with ₹ 29,299 and small farmers with ₹ 1,992 per household per year and total income of 53,540 per farm household per year. Numerically there is decline in income of farmers but COVID has more or less has shown no significant effect on the income of the farmers. The COVID, farm size, livestock possession and yield were found significantly determine the income of the farm households.

Table 3. Determinants of farm income of farm household during a COVID year

1	Constant	Intercept	174246.30	1,75,529	1.01 ^{NS}	
2	COVID	X ₁	49035.55	-98,492	-2.01**	
3	Age	X ₂	2413.20	-2,767	-1.15 ^{NS}	
4	Education	X ₃	27283.10	21,781	0.80 ^{NS}	
5	Farm size	X ₄	17138.39	95,735	5.43***	10.10*** 0.39
6	Membership in org	X ₅	57722.45	-45,286	-0.8 ^{NS}	
7	Livestock possession	X ₆	53301.90	2,89,501	5.43***	
8	Yield	X ₇	6.74	-12.70	-1.90*	

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