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Impact of COVID 19 on Agricultural Sector in West Godavari District of Andhra Pradesh, 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

This study was formulated to know the impact of COVID-19 on agriculture and allied sectors in Krishi Vigyan Kendra Operational areas in West Godavari District. E*x-post facto* design of research was used. Data was collected from 60 farmers. Interview schedule as well as questionnaire was developed in the form of Google on set of question related to impact of COVID 19 on horticulture

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sector, food sector and livestock sector. Normal descriptive statistics (frequency & per centage) was used. During the study it observed that in horticulture sector harvesting of major fruits and vegetable crops have been affected due labour shortage. Impact of COVID 19 in case of food crops is harvesting of major food crop (paddy) was completed due to mechanization but the labour unavailability has increased the labour cost and cost of cultivation of crops. In livestock sector, feed and concentrate availability were major affected areas followed by non-availability of veterinary services, shortage of fish seed, feed and transportation. 86.66 per cent of farmers reported that the government has announced relief measures and supply ration to poor ration card holders including farmers and farm women get 5 kg of rice and one Kg of pulses free of cost every month during lockdown period. 86.66 per cent farmers suggested that quality seed, fertilizers, pesticides supply from the government on subsidy basis followed by Provide MSP for produce and government directly procure the produce from farmers.

Keywords: Impact of COVID 19; horticulture sector; food crops; livestock; lockdown.

1. INTRODUCTION

COVID-19 has emerged as a global pandemic, which has impacted world economy. Due to Lockdown from 24th of March in India because of COVID-19 which has halted all the activities and affected all walks of life. The Indian economy was expected to lose over ₹32,000 crore (US$4.5 billion) every day during the first 21-days of complete lockdown [1]. The economic impact of the 2020 coronavirus pandemic in India has been largely disruptive. India's growth in the fourth quarter of the fiscal year 2020 went down to 3.1% according to the Ministry of Statistics [2]. During the lockdown, an estimated 14 crore (140 million) people lost employment while salaries were cut for many others [3]. More than 45% of households across the nation have reported an income drop as compared to the previous year .The farm economy (i.e. Agriculture sector) faced a severe hit, because of halted transportation, movement of people, which stagnate the harvest, and further during the peak harvest, the produce could not reach mandis, thus disrupting the supply chain. Beside the unavailability of migrant laborers, intercepting the harvest and post-harvest operation [4]. The worst part of the imposing social restriction was that it coincided with the country's peak harvesting time of a variety of crops of the season. Summer vegetables and fruits were ripened and ready to pick; maize, paddy and pulse crops were ready for harvest that may hit adversely the farmers [5]. In this respect, the study has been planned to study the impact of coronavirus (COVID-19) on agriculture and allied sector.

2. MATERIALS AND METHODS

This study was planned to see the impact of Coronavirus (COVID-19) on different sections such as agriculture, horticulture and livestock. An expost facto design of research was used for the study. Questionnaire was developed and collected the data from farmers and village agricultural assistants and village horticultural assistants of Andhra Pradesh. The questionnaire was also developed with the help of Google form on two specific objectives 1.To study the profile characteristics of respondents 2.to study the impact of COVID 19 on agriculture and allied sector. A total of 60 farmers were selected for study. The scores were assigned to the variables but convenience purpose the results were expressed in the form of frequencies and percentages. Responses were collected in categorical variable viz yes (2) or no (1) against each statement. Statistical tools like Arithmetic mean (X), Frequency and percentage has been used.

3. RESULTS AND DISCUSSION

3.1 Profile Characteristics of Respondents

Distribution of respondents according to their profile characteristics are presented in Table 1. The study showed that majority were middle-aged (58.33 %) had degree level of education (26.67%), family size of 4 members with nuclear family system (78.33%) majority belonging to open category (46.67 %) while agriculture and horticulture as a main occupation (65.00%) with farm size of small holding 36.67 percentage, medium experience in farming (51.67 %) having annual income of 50000 to 1 lakh rupees (40.00%), got source of information from agricultural officer (23.33 %), 53.33 percent having Membership in one organization, 56.67 percent regularly got information on farming.

48 per cent of the farmers getting horticulture and agriculture information from TV Channels, whatsapp and mobile applications. At present in Andhra Pradesh state, there are nearly 10-12 programms exclusively on agriculture and allied sectors besides Doordarshan channel by the different private TV channels telecasting through cable TVs. The farmers are utilizing the television very frequently for acquiring farm technologies besides whatsapp and print media.

Table 1. Distribution of respondents according to profile characteristics

Variable	Category	Frequency	Percentage
Age	Young (Below 35 years)	13	21.67
	Middle (36 to 55 years)	35	58.33
	Old (more than 55 years)	12	20.00
Education	Illiterate	4	6.66
	Primary school	5	8.33
	Middle school	11	18.33
	High school	10	16.66
	Intermediate	5	8.35
	Degree	16	26.67
	Post graduation	9	15.00
Occupation	Agriculture /horticulture	39	65.00
	Government employee	7	11.67
	Related to business	10	16.67
	Other	4	6.66
Caste	OC	28	46.67
	OBC	8	13.33
	SC	15	25.00
	ST	9	15.00
Experience In Farming	Low (less than 5 years)	11	18.33
	Medium (5 to 25 years)	31	51.67
	High (more than 25 years)	18	30.00
Farm size	Marginal (<1 ha)	14	23.33
	Small (1-2 ha)	22	36.67
	Semi medium (2 – 4 ha)	8	13.33
	Medium (4 -10 ha)	7	11.67
	Large (>10 ha)	9	15.00
Annual income	10000 to 50000	10	16.67
	50000 to 1 lakh	24	40.00
	1 lakh to 1.5 lakh	7	11.66
	lakh to 2 lakh	8	13.34
	>2 lakh	11	18.33
Source of information	Agricultural extension officer	9	15.00
	Agricultural officer	14	23.33
	ADA	8	13.33
	Scientist	7	11.66
	Neighbouring farmers	10	16.66
	Friends	12	20.00
Family type	Joint	13	21.67
	Nuclear	47	78.33
Social participation	No membership	28	46.67
	Membership in one organization	32	53.33
Extension contact	Regularly	34	56.67
	Occasionally	5	8.33
	Rarely	21	35.00
Mass media exposure	Low (19-26)	18	30.00
	Medium (27-34)	29	48.34
	High (35-42)	13	21.66

3.2 To Study the Impact of COVID 19 on Agriculture and Allied Sector

3.2.1 Effect on horticulture sector

India is the second largest producer of fruits and vegetables in the world after china with a share of 12.2 and 10.7 per cent, respectively, of the global production. the major fruits grown in India are mango, banana, grapes, guava and papaya, pomegranate, sapota and anole for many years, horticulture has emerged as the growth driver of agriculture in India contributing nearly one third to agricultural GDP with annual growth of 9.5 percent and 7 per cent in fruits and vegetables respectively (1991-92 to 2018-19).The impact of Indian horticulture sector is quite visible now.

The impact of coronavirus was observed on horticulture sector and it was found that 85 per cent of respondents were agreed that harvesting of major fruits and vegetable crops have been affected in west Godavari district due labour shortage. 91.60 per cent reported that due to the lockdown labours not available for doing timely and harvesting operation in horticultural crops more predominant in banana, mango, acid lime, guava, papaya, oil palm, watermelon and vegetables. 81.66 per cent reported that proper time of harvesting period delay in water melon, acid lime. Some part of the crop left in the field itself .In some crops due to delay harvesting production was reduced.

80 percent of the farmers reported that due to unavailability of transportation facility the produce not send to other places. Further the restricted movement the transport charges also increased.

86.66 percent of the farmers reported that market price for perishable commodities of fruits and vegetables reduced. In case of coconut, acid lime, guava and mango crops farmers not get the remunerative price for their produce. Oil palm the price reduced per tonne is 400 rupees, it was reported by the 85 per cent of the respondents. This may be due to non availability of buyers due to market uncertainty and misinformation so majority of the farmers go to local markets and sold their produce with low price.

3.3 Effect on Food Crops

Majority of the respondents (81.66%) agreed that the harvesting of paddy has been completed with the help of paddy harvester at proper time and did not get affected more due to covid 19. As per government statistics in first advance estimates of production of major crops for 2020-21 the total rice production in the country is 102.36 million tones which 1per cent (0.38 million tones) when compared to previous record 101.98 million tonnes during the 2019-20 crop year. the fact that delineated with the study that the harvesting of rice has been completed almost at proper time and did not affect more due to coronavirus infection.

Regular farm labour unavailability has increase the labour cost and cost of cultivation of crops as agreed by 91.6 percent of the respondents. this might be due to shortage of labour. in paddy transplanting operation require more number of labour previously farmers used the migrated labour of bihar at present due lock down the labour not available and farmers used the family labour and contract labour for field operations and paid more wages for them.

The labour unavailability has affected the procurement operation due to labour shortage for loading, unloading of produce in the market as agreed by 80.00 per cent of the respondents predominantly in case of paddy and maize crops the procurement process delayed which in turn reduced the money payment to farmers.

Table 2. Impact of COVID 19 on agriculture and allied sector

S. No	Statements	Responses	
		Yes	No
1	Harvesting of major fruits and vegetable crops have been affected	51 (85%)	9 (15%)
2	labours not available for doing timely and harvesting operation in horticultural crops	55 (91.6%)	5 (8.33%)
3	Proper time of harvesting is delay	49 (81.66%)	11 (18.33%)
4	unavailability of transportation facility	48(80%)	12(20%)
5	Market price for perishable commodities of fruits and vegetables reduced	52 (86.66%)	8 (13.33%)

Table 3. Effect on food crops

S. No	Statements	Responses	
		Yes	No
1	Harvesting of paddy has been completed with the help of paddy harvester at proper time and did not get affected more due to covid 19	49(81.66%)	11(18.33%)
2	Farm labour unavailability has increase the labour cost and cost of cultivation of crops	55(91.6%)	5(8.33%)
3	labour unavailability has affected the procurement operation	48(80%)	12(20%)
4	Reduced the availability of machinery and machinery related spare parts	47(78.33)	13(21.66%)

Reduced the availability of machinery and machinery related spare parts for doing timely operations in crops. This may be due to the restricted opening of shops. This was reported by the 78.33 per cent of respondents.

3.4 Effect on Livestock

Livestock plays an important role in Indian economy about 20.5 million people depend upon livestock for their livelihood. Livelihood contributes 16 per cent to the income of small farm households as against an average of 14 per cent for all rural households. Livestock provides livelihood to two third of rural community. it also provides employment to about 8.8 per cent of the population in India. Livestock contributes 4.11 per cent GDP. India is number one in cattle and milk production in the world second largest producer of fish and also second largest aquaculture in the nation in the world.

Majority of farmers (91.60%) reported feed and concentrate were not available for animals because of interrupted supply to the users. The reason might be that movement restriction; labour shortage reduced the supply of raw material to shops.

66.67 per cent were agreed that the farmers had faced problem in selling the milk to their customers in town and milk collection centre. Majority of farmers were agreed that the milk price has not fallen in the villages and dairy farmers were not found in distress sale.

76.67 per cent reported reduced the chicken demand and public procurement. Fake news and rumors is one of the reason. In India chicken sales were reduced significantly after posts on social media created the impression that humans could contract covid 19 by consuming chicken [6].

Veterinary services are required continuously for animals and in the study it was found that majority of respondents (86.66%) were agreed that veterinarians were not available for any type of health problem.

Non availability of labour for fish farming this was reported 85 per cent of respondents. March to June is the peak season for fish farming which were hampered due to non-availability of labour.

Table 4. Effect on livestock

S. No	Statements	Responses	
		Yes	No
1	feed and concentrate were not available for animals	55 (91.6%)	5(8.33%)
2	problem in selling the milk to their customers in town	40(66.67%)	20 (33.33%)
3	reduced the chicken demand and public procurement	46 (76.67%)	14 (23.33%)
4	Veterinary services were not available	52 (86.66%)	8(13.33%)
5	Non availability of labour for fish farming	51 (85%)	9 (15%)
6	Shortage of fish seed, feed and other inputs	50(83.33%)	10(16.67%)
7	not sell their crop(aqua) properly	49 (81.66%)	11(18.33%)

Table 5. Quality inputs and services for higher crop productivity

S. No	Measures	Responses	
		Yes	No
1	Paddy and maize purchase centres	49(81.66%)	11(18.33%)
2	Rythu barosa from state government	51 (85%)	9 (15%)
3	Intra and inter movement of machinery related to agriculture i.e sowing and harvesting is also exempted from the lockdown rules	45(75%)	15(25%)
4	Jan Dhan Bank accounts would get one time cash help of Rs 1,500 for three months.	50(83.33%)	10(16.67%)
5	Supply ration to poor ration card holders including farmers and farm women	52 (86.66%)	8(13.33%)

Shortage of fish seed, feed and other inputs hamper the desire production level. This was reported by 83.33 per cent of the respondents. Shortage of supply in turn leads to hike the price also. it further increased the cost of cultivation.

81.66 percent of farmers are not sell their crop (aqua) properly the reason might be transportation hurdles, closure of different retail outlets and lack of proper functioning of supply chains.

3.5 Mitigation Measures

India is having approximately 85% household being small and marginal farmers and major part of them as landless farm laborers; therefore welfare measures to contain any damage from COVID-19 are definitely going to help them with sincere implementation 81.66 percent farmers reported that during lockdown period The Government have taken timely and prompt action by opening of required number of paddy / maize purchase centres in the districts.

86 per cent of farmers reported that The government has announced relief measures and supply ration to poor ration card holders including farmers and farm women get 5 kg of rice and one Kg of preferred pulses free of cost every month during lockdown period. Besides 83 percent farm women having Jan Dhan Bank accounts would get one time cash help of Rs 1,500 for three months [7].

75 percent reported that Intra and inter movement of machinery related to agriculture i.e sowing and harvesting is also exempted from the lockdown rules [8].

85 per cent farmers received rythu bharosa .state government providing financial assistance to the farmer families, including tenant farmers across the State @ Rs.13,500/- per farmer family, per year, to support the cultivators in meeting the investment during the crop season with a view to enable them to timely sourcing of quality inputs and services for higher crop productivity.

4. SUGGESTIONS

86.66 percent farmers suggested that quality seed, fertilizers, pesticides supply from the government on subsidy basis. 85 per cent farmers suggested that government directly procure the produce from farmers Presence of too many intermediates/middlemen results in the exploitation of both farmers and consumers with the middlemen offering lower prices to farmers and charging higher prices from the consumers.

86.66 farmers suggested that provide MSP for their produce. MSP is price fixed by Government of India to protect the producer - farmers - against excessive fall in price during bumper production years. The minimum support prices are a guarantee price for their produce from the Government. The major objectives are to support the farmers from distress sales and to procure food grains for public distribution.

75 percent farmers suggested Establishment of processing units for horticultural crops. Produce during glut season utilized for making different processed products, thus processing units for horticultural crops helps in reducing wastage and handling excess produce during glut season 80 percent suggested that provide agricultural loans with zero percent interest.81.66 percent suggested that provide storage and cold storage facilities. *Cold storage facilities allow storage* of temperature-sensitive produce like fruits, vegetables, fish, meat etc.

Table 6. Farm machinery to farmers

S. No	Statements	Responses	
		Yes	No
1	Quality seed ,fertilizers, pesticides supply from the government on subsidy basis	52 (86.66%)	8 (13.33%)
2	Government directly procure the produce from farmers	51 (85%)	9 (15%)
3	Establishment of processing units for horticultural crops	45 (75%)	15 (25%)
4	Provide agricultural loans with zero percent interest	48 (80%)	12 (20%)
5	Provide storage and cold storage facilities	49(81.66%)	11(18.33%)
6	Farm machinery available to farmers for doing timely operations	47 (78.33)	13 (21.66%)
7	Provide MSP for produce	52 (86.66%)	8(13.33%)
8	Agricultural works should merged with MNREGA	46 (76.67%)	14 (23.33%)

78.33 percent suggested that provide Farm machinery to farmers for doing timely operations in various crops .76.67 percent farmers suggested that Agricultural works should merged with MNREGA.

5. CONCLUSION

COVID-19 has sealed every boundary and the economic activities of country. It has produced enormous effect on agriculture and allied sectors, which is called as base of Indian economy. In Horticulture sector, harvesting of major fruits and vegetable crops have been affected due labour shortage. In case of food crops is harvesting of major food crop (paddy) was completed due to mechanization but the labour unavailability has increased the labour cost and cost of cultivation of crops. In livestock sector, feed and concentrate availability were major affected areas .The migrant agricultural labourers have created the crunch situation before the farming situations, which needs to be tackled with more care and attention. These sudden problems have arisen due to COVID-19 restriction to movement there is great need of creating awareness for COVID-19 and their myths. There is need to support our farmer by various government schemes with effective implementation and execution.

6. RECOMMENDATIONS

To overcome the labour unavailability, mechanisation of farm and custom hiring centres needed to be promoted by the government. Small scale processing units started in convergence mode with various ministries like agriculture, MSME, Rural development, Food and processing ministry. Bee keeping, Vermicomposting, poultry rearing, sericulture etc promoted by the KVKS Availability of feed and concentrate should be ensured and more fodder-based crop pattern can be adopted. Poultry sectors need to be encouraged and misinformation needs to reduce by disseminating authentic information by government officials. need to use more ICT marketing digital platform like e-NAM, Agrmarknet etc. to be established through different government sources.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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