Original Research Article

Effectiveness of weather based agromet advisories on economics of farmers in West Godavari district of Andhra Pradesh

ABSTRACT

~~Weather plays a crucial role in sustainable agricultural production. All the activities of agriculture starting from field preparation to post harvest are influenced by weather. The adverse effect of weather on the farmer's livelihood can be reduced if the weather forecast is used effectively.~~ ~~ICAR District Agromet unit (DAMU) was established in Dr YSRHU KVK venkataramannagudem during the year 2018-19. A total 28 number of whatsapp groups created with farmers and extension personnel by the district agro met unit of Dr YSRHU, KVK, Venkataramannagudem. Through these whatsapp groups, agro met advisory bulletins prepared based on the weather forecast received from India Meteorological Department, Pune, and disseminated to about farmers (11280) and extension personnel (573) on every Tuesday and Friday covering 905 villages in w~~West Godavari district.~~~~ Present study was conducted during the year 2021-22 to assess the effectiveness of weather based Agro-met Advisory Services (AAS) and to quantify the economic gain of farmers through adoption of advisory in their day-today farming practices. For this purpose, farmers were formed into two groups namely, a group adopting the agro-met advisories (AAS farmers) and other group not aware of agro-met advisories (non-AAS farmers). A total of 150 farmers (including AAS(100) and Non AAS(50) were identified. The agro-met advisor~~y~~es were disseminated among AAS farmers for kharif ,rabi and summers seasons of 2021-22 and care was taken for proper implementation of advisories by this group. Expenditure incurred & crop situation of both the group of farmers were compared at every stage from land preparation to harvest and crop growth and yields were monitored regularly among them. Significant results were ~~reported~~ observed ~~for~~ in crop in case of growth and yield among the AAS farmers compared to non-AAS farmers. The AAS farmers reported that they got 13,8.5,12,4.1,6.7,12 and 14 per cent of additional benefit in paddy, maize, groundnut, blackgram, chilli, tomato and banana respectively. ~~The gain in additional benefit was due to management of crop according to agro met advisory bulletins. In the same way~~ The same

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benefit obtained AAS ~~services are also provided~~ farmers in ~~to~~ fruit crops during ~~the stages of~~ pre-flowering, flowering, fruit setting and development to harvesting stages. ~~for mango, banana, guava, acid lime and papaya crops.~~ These advisories ~~Agromet advisories especially~~ during pre and post cyclone periods gained a huge positive response. ~~from the farmers.~~ By following timely harvesting advisories based on current and forecasted weather conditions saved 15 to 20 percent of farmers income. ~~by avoiding losses due to weather variations.~~ ~~Therefore,~~ ~~a~~Adoption of agro-met advisory bulletin is an effective tool for enhancing the net productivity and income of farmers.

Key words : Agro met advisory bulletins, net income, AAS farmers, Yield, non AAs farmers

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Introduction

Weather is the most important factors that adversely affect the agricultural production. ~~Among the various factors affecting the agricultural production weather is the most important one. Weather plays a crucial role in sustainable agricultural production.~~ All the activities ~~of~~ in agriculture starting from the field preparation to post harvest are influenced by weather. Every phase of growth and development in plants are closely related with ~~affected by the~~ weather. Rainfall and its distribution in the agriculture create greater effect than any other weather parameters. ~~Among the weather parameters rainfall and its distribution fluctuates greatly than other parameters.~~ Any variability in the rainfall during the crop season such as delay in onset of monsoon, excessive rains and prolonged dry spells would affect the crop growth and finally the quality and quantity of the produces. Adoption of the real time contingencies in crop management based on weather forecast can minimize crop losses. The adverse effect of weather on the farmer's livelihood can be reduced if the weather forecast and advisory services is used effectively (Rathore et al., 2013; Chattopadhyay et al., 2016). Therefore, it is important to educate farmers about the value of agromet advisories in managing daily agricultural operations, which will lower losses and increase production (Rathore and Chattopadhyay, 2016). Accordingly Agrometeorological Advisory Services (AAS) at the agroclimatic zone level have been offered to the farming community by the National Centre for Medium Range Weather Forecasting (NCMRWF) under the Ministry of Earth Sciences (MoES), Government of India, in cooperation with the India Meteorological Department (IMD), Indian Council of Agricultural Research, and State Agricultural Universities (MRWF) (Chaubey et al., 2018). Hence Present study was conducted during the year 2021-22 to assess the effectiveness of weather based Agro-met Advisory Services (AAS) and to quantify the economic gain of farmers through adoption of advisory in their day-today farming practices

Methodology

Present study was conducted during the year 2021-22 to assess the effectiveness of weather based agro advisory in their day-to-day farming practices. For this purpose, ~~farmers were grouped into~~ create two groups, first group adopting the agromet advisory services (AAS farmers) and ~~other~~ another group was not aware of agromet advisory services (Non AAS farmers). ~~100 farmers received AAS and 50 farmers not received AAS.~~ A total 150 farmers were selected for ~~the~~ this study among them 100 farmers in AAS group and rest 50 farmers in non-AAS group. The agro-met advisor~~y~~ies were disseminated among AAS farmers for kharif, rabi and summers seasons of 2021-22 and care was taken for proper implementation of advisories

by this group. Same were compared to other farmers who are not followed the agro advisories.

ICAR-District Agromet unit (DAMU) ~~was established in Dr YSRHU KVK venkataramannagudem during the year 2018-19.~~ taking data in ~~E~~every Tuesday and Friday they ~~were received the weather forecast~~ from Indian meteorological department Pune. Based on ~~the~~ this ~~weather~~ forecast weather bulletins prepared and ~~disseminated~~ percolate among ~~to~~ the 28 number of WhatsApp group farmers in the district. ~~A total 28 number of Whatsapp groups created with farmers and extension personnel by in the district agro-met unit of Dr YSRHU, KVK, Venkataramannagudem.~~ Through these Whatsapp groups, agromet advisory bulletins prepared ~~based on the weather forecast received from India Meterological Department, Pune~~ and disseminated to farmers (11280) and extension personnel (573) on every Tuesday and Friday covering 905 villages in west Godavari district. Statistical tools like frequency and percentage were used

Results and discussions:

Expenditure incurred & crop situation of both the group of farmers were compared at every stage from land preparation to harvest and crop growth and yields were monitored regularly among them

Frequency and coverage of weather forecast used by the farmers

It was revealed from the study that most of the farmers gave more importance to forecast of rainfall over temperature, wind speed and cloud cover. Wind speed and cloud cover play an important role during infestation of pest and diseases. About 80 per cent farmers were keen to have bi-weekly rainfall forecast of rainfall to carryout various agricultural operations. Forecast on wind and cloud cover by 62 and 60 per cent of farmers respectively at biweekly intervals. About 54 per cent of the farmers were not interested to obtain the forecast of temperature.

Table 1: Frequency and coverage of weather forecast

Frequency	Rainfall	Temperature	Wind	Cloud cover
Daily	9(3)	0(0)	0(0)	14(5)
Bi-weekly	80(28)	34(12)	62(22)	60(21)
Weekly	11(4)	6(2)	6(2)	6(2)
Fortnight	0(0)	0(0)	0(0)	0(0)
Monthly	0(0)	0(0)	0(0)	0(0)
Seasonally	0(0)	6(2)	6(2)	0(0)
Not aware	0(0)	54(19)	26(9)	20(7)

~~Table 1: Frequency and coverage of weather forecast~~

AAS farmer's perception towards agro-met advisory service in West Godavari district

The results on farmers perception about agromet advisory service revealed 65% of farmers rated the service as very good on the scale of very poor to very good. Majority of the farmers 100 % agreed on necessity of AAS and felt that advisories based on predicted rainfall event is very much useful in their farming activities. Majority 88 per cent of farmers perceived that AAS was essential and it helps to reduce the cost of cultivation in agricultural production followed by managing pest and diseases (75%) during

cropping season. more than 85 per cent of the farmers opined that real time agro met advisory services was helpful in harvesting stage followed by sowing stage (82%) since dissemination of AAS services prior to cropping season with useful weather information particularly information on timely rainfall, temperature and humidity helps farmers to plan their farm activities specially land preparation and sowing activities timely and accurately, more than 91 % of farmers perceived

AAS was accurate timely available and more than 92 per cent of farmers opined that biweekly forecast of weather information was good as it helps to take short term decisions on farming activities. findings of the study indicated that more than 95 % of AAS farmers were satisfied with the agro met advisory services. These findings were also supported by the work of Manjusree R.V. et al., (2022).

Table 2: AAS farmers perception towards agro-met advisory service

	AAS Received farmers	
Perception about AAS	Frequency (f)	Percentage (%)
Very poor	8	8
Poor	22	22
Good	5	5
Very good	65	65
Necessity of AAS		
Yes	93	93
No	7	7
For which weather parameter AAS is essential		
Rainfall	100	100
Temperature	46	46
Cloud cover	80	80
Wind velocity	74	74
Benefit of AAS		
Yes	82	82
No	18	18
Which way you are benefited from AAS		
Reducing cost during sowing	88	88
Fertilizer application	62	62
Managing pest and disease	75	75
Avoid post harvest losses	40	40

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Reducing irrigation charges	67	67
At what stage of crop AAS is essential		
Sowing stage	82	82
Flowering stage	66	66
Fruit formation stage	55	55
Harvesting stage	85	85
Quality of AAS information disseminated		
Good	91	91
Average	6	6
Poor	3	3
Frequency of forecasting		
Daily	6	6
Weekly	2	2
Bi-weekly	92	92
Monthly	0	0
Overall satisfaction about AAS		
Yes	95	95
No	5	5

~~Table 2: AAS farmers perception towards agro-met advisory service~~

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Impact of AAS on crop productivity and economics of cropping systems

Impact of AAS on crop productivity and economics of cropping systems indicated that there ~~were~~ was considerable benefit to farmers who are adopted and regularly follow the agromet advisory services over non adopted farmers. The percent gain in net income due to AAS was ranging from 4.1 to 14 percent. The net returns realized by the AAS farmers was more as compared to non AAS farmers which was mainly attributed to timely adoption of farm advisories disseminated by the District Agromet Unit(DAMU). Further better crop management practices based on advisories such as timely sowing, selection of improved varieties, timely application of fertilizer, pest and disease management, lifesaving irrigation and harvesting which help them to reduce the cost of cultivation over non AAS farmers. The high net returns and reduced cost of cultivation of different crops under AAS category. This was also evident from B:C ratios arrived from the results. The AAS farmers reported that 13,8.5,12,4.1,6.7,12,14 per cent of additional benefit in paddy, maize, groundnut, blackgram, chilli, tomato and banana. The gain in additional benefit was due to management of crop according to agromet advisory bullentins.in the same

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way AAS services are also provided to fruit crops during the stages of pre flowering, flowering, fruit setting and fruit development to harvesting for mango, banana, guava, acid lime and papaya. AAS especially during pre and post cyclone periods gained a huge positive response from the farmers by following timely harvesting advisories based on current and forecasted weather conditions saved 15 to 20 per cent of farmers income by avoiding losses due to weather variations.

Table 3: Impact of AAS on crop productivity and economics of cropping systems

Crops									% change over non AAS
	Coc/ha	Yields/ha	Net returns/ha	B:C ratio	Coc/ha	Yields/ha	Net returns/ha	B:C ratio	
Paddy	36500	6.25t	62925	1.73:1	41700	7t	55600	1.5:1	13
Maize	69500	85q	83500	1.2:1	72500	83q	76900	1.06:1	8.5
Groundnut	38875	38.75q	209250	5.4:1	43500	40q	185670	4.2:1	12
Blackgram	30000	22.5q	76250	2.54:1	34500	24q	73200	2.1:1	4.1
Chilli	190000	75q	260000	1.36:1	220000	79q	243500	1.1:1	6.7
Tomato	28130	30q	59055	2.09:1	29912	27q	52592	1.75:	12
Banana	198430	32.5t	268400	2.35:1	1872875	27.5t	235342	2.26:1	14

Table 3: Impact of AAS on crop productivity and economics of cropping systems

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Qualities of agro advisory services

The qualities of forecast on agro advisory services were indicate most of the farmers opined that the forecast on weather related parameters and harvest and post-harvest measures were very good. While forecast on field operations ranked very good. Farmers were ranked excellent for the weather based agro advisory services and utilized the advices in scheduling of irrigation and application of chemical fertilizers and deciding best time for taking control measures (spraying) for pest and diseases and crop variety selection ranked moderate.

Table 4: Qualities of agro advisory services

Category	Weather related	Field operations	Crop and variety selection	Pest and disease	Harvest and post-harvest
Excellent	40(14)	20(7)	3(1)	17(6)	26 (9)
Very good	34(12)	43(15)	20(7)	29(10)	46(16)
Good	26 (9)	28(10)	20(7)	45(16)	28(10)
Moderate	0(0)	9(10)	46(16)	6(2)	0(0)
Poor	0 (0)	0 (0)	11(4)	3(1)	0(0)

Table 4: Qualities of agro advisory services

Conclusion

It was revealed in this survey that AAS farmers get higher yield and net returns than Non-AAS farmers because of using the agro-weather advisory, the crop of AAS farmers used to less cost of cultivation and the use of agricultural techniques increased the yield therefore resulted in higher net returns.

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