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## Analyzing the impact of weather based agro-advisory services of GKMS project among arecanut growers of Udupi district of Karnataka

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### Abstract

The study was undertaken to assess the impact of perception level of Arecanut growing farmers about weather based Agro advisory services (AAS) provided by AMFU of GKMS project at ZAHRS Brahmavar. The sample set consisted of 300 farmers, comprising 150 Registered and 150 non registered Arecanut growers of Udupi district. Farmer respondents were purposively selected and conducted personal interview. Results indicated that 41.33 percent of old aged registered farmers are focusing much more preferable to adapt weather based agricultural practices. The survey revealed that 76.6 per cent of farmers focus more on weather forecast before going for harvesting and 50 per cent for post harvest management (Drying). Most of the farmers were in need Rainfall forecast (85 percent) followed by temperature forecast (65 percent) respectively. Accurate Timely weather forecast aids AAS registered farmers to plan agricultural operations to avoid crop losses thereby maintain sustain and stable farm income. Arecanut growers of Udupi district prefer weather forecasting to plan their farm operations like Fertilizer application, Bordo spraying, Harvesting *etc.*, Study revealed that 45.33 percent of AAS registered Arecanut growers farm income was raised in between 25,000 to 50,000 per annum after the intervention of AAS. Finally, 71.3 percent of farmers were satisfied by AAS service rendered by AMFU of ZAHRS, Brahmavar.

**Keywords:** GKMS, AMFU, AAS, registered farmers, arecanut growers

### 1. Introduction

Agromet Advisory Services plays a vital role in Agriculture and allied activities by providing valuable information about all agricultural operations from land preparation to post harvesting operations with respect to prevailing weather conditions (S.Sridahara *et al.*, 2014). About 66% of crop production will be influenced by Agrometeorological factors. Accuracy based forecast will help farmers to overcome various types of losses in Agriculture and allied activities (SR Reddy, 2019) [9]. The main aim of AAS is to reduce the losses in agriculture and to increase the income level of farmers by the intervention of new technologies in agriculture. At the same time the application of weather forecast at ground level depends upon on its accuracy. Farmers option on selection of varieties, input use, crop management, nutrient management, protection practices and harvest is influenced by spatial and temporal changes in important weather parameters like rainfall, temperature, wind speed and direction, cloud cover and humidity. Lack of timely and reliable agro meteorological information is a serious limitation for effective farm planning operations. To overcome these type of losses caused by weather aberrations the National Centre for Medium Range Weather Forecasting has taken up the weekly Agromet advisory service (AAS) based on medium range forecasting to serve the farming community with a wide network of 130 centers across the Country from 1988 onwards (Rao, 2008) [7]. AMFU-Brahamavar which is functional at Zonal Agricultural and Horticultural Research station, Brahmavar is receiving the forecast since 2005 and issuing agro advisory bulletins through different media to assist the farmers over the Coastal zone of Karnataka.

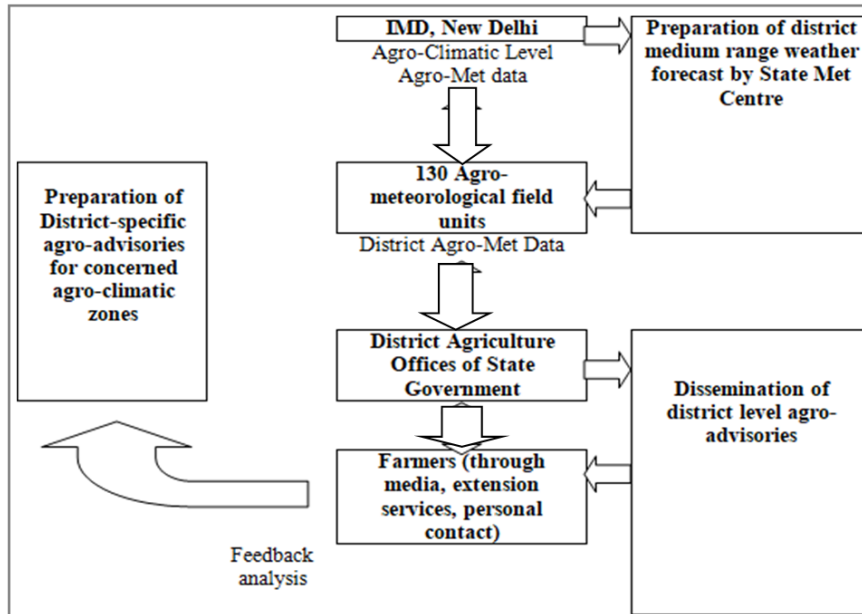
In this context, Zonal Agricultural and Horticultural Research Station, Brahmavar located at Udupi district of Karnataka lies under agro-climatic zone 10 (coastal zone) having longitude of 74° 45'E and latitude of 13° 25'N with 10 meters above mean sea level. Now a days Arecanut is occupying more area in terms of length and width because of its high market value and favorable climatic conditions. Hence the survey was conducted among the Arecanut growers

of district to know the effectiveness of Agromet Advisory services. The present paper aimed to study the effectiveness of the agromet advisory services and to assess the economic impact of the service of Arecanut growing farmers in Udupi district.

**2. Research Methodology**

The present study was conducted in Udupi district of

Karnataka during 2021. A random sample of 150 farmers were selected which includes 50 farmers each from three taluks namely Karkala, Udupi and Kundapura. The descriptive statistics to the frequency, percentage and tabular analysis were employed to assess the farmer’s knowledge and perception about agromet advisory services.



**Fig 1:** AAS institutional mechanism to reach farmers in India (Venkatasubramanian, 2014) <sup>[10]</sup>

**3. Results and Discussion**

With the upcoming modernization in all sectors under subsistence culture would certainly require a proper resource based agro- advisory approach to support farming community to regulate their agricultural activities accordingly which enhances their farm income. For the purpose, India’s Integrated Agro- meteorological Advisory Service (AAS) program is one of the largest agro-meteorological based information broadcasting weather services for the farmers. Under forecast updates since last few decades, IMD launched a District-level Agro-meteorological Advisory Service (DAAS) in 2008 and Block Level Agromet Advisory Services

in 2019 on experimental mode with the aim to provide relevant weather information and management advisories at a district scale across the country. An attempt was made to understand the response of Arecanut growing farming communities on these forecasts and services at Udupi district where maximum number of farmers being covered under Agro meteorology field unit (AMFU)-Brahmavar which is functional at Zonal Agricultural and Horticultural Research Station, Brahmavar. Studies revealed that all age group people are responding this system of advisory services and its adoption is increasing day by day due to accuracy in weather forecast.

**Table 1:** Socio economic characteristics of farmer respondents

Sl. no	Particulars	Category	AAS registered farmers		AAS nonregistered farmers	
			Frequency	%	Frequency	%
1	Age	Young(<35)	29	19.33	32	21.33
		Middle(36-45)	59	39.33	61	40.67
		Old(>50)	62	41.33	57	38.00
2	Education	Illiterate	15	10.00	22	14.67
		Primary	32	21.33	29	19.33
		Higher secondary	69	46.00	45	30.00
		Graduation	49	32.67	13	8.67
3	Gender	Male	132	88.00	122	81.33
		Female	18	12.00	28	18.67
4	Land Holding	Marginal and small	108	72.00	119	79.33
		Medium	28	18.67	22	14.67
		Large	14	9.33	9	6.00
5	Family Size	Small(<5)	56	37.33	36	24.00
		Medium (6-8)	72	48.00	83	55.33
		Large (>9)	22	14.67	31	20.67
6	Family Type	Nuclear	52	34.67	34	22.67
		Joint	98	65.33	116	77.33

7	Farming Experience	Low(<15years)	38	25.33	38	25.33
		Middle (16-25 years)	69	46.00	69	46.00
		High (>25 years)	43	28.67	43	28.67
8	Subsidiary Occupation	Yes	139	92.67	131	87.33
		No	11	7.33	19	12.67
9	Increase In Farmers Income After AAS Intervention (Rs/Ha)	<25,000	49	32.67	83	55.33
		25,000-50,000	68	45.33	47	31.33
		>50,000	33	22.00	20	13.33
10	Social Participation	Yes	134	89.33	134	89.33
		No	16	10.67	16	10.67
11	Institutional Credit	Yes	124	82.67	124	82.67
		No	26	17.33	26	17.33

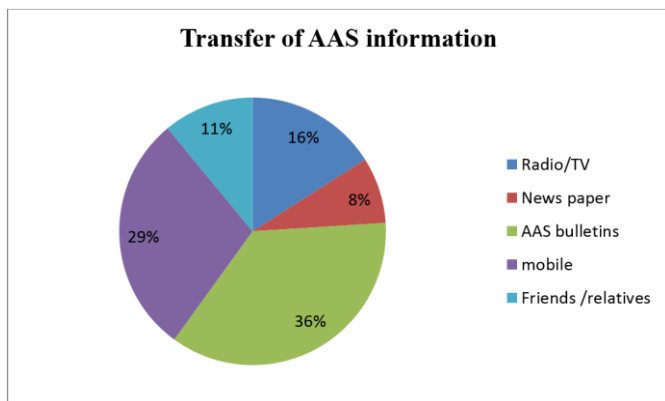


Fig 2: Mode of transfer of information to farmers

Table 1 revealed that 41.33 per cent AAS registered farmers were old aged while 40.67 per cent of non AAS registered farmers are in the middle-aged group. The age of farmers usually represents their skill in farming with respect to the crop grown and old aged farmers are expected to have high experience and knowledge about farming and associated risks involved in it. 46 per cent of AAS registered farmers were educated upto Higher Secondary while 30 percentage of non-registered AAS farmers were educated same. Male farmers participation is high in both AAS registered as well as non-AAS farmers group as compared to female participation(Female participation is approximately same in both groups). Majority of AAS registered farmers (48 per cent) and non-registered AAS farmers (55.3 per cent) had medium family size. Besides 65.3 per cent AAS registered farmers and 77.3 percent non- registered AAS farmers have joint family. Majority of AAS registered farmers (46 per cent) have farming experience in between 16-25 years same trend was observed in case of (48 per cent) non-registered AAS farmers have (Table 1). 45.3 percent of AAS registered farmers income was raised by 25,000 to 50,000 per hectare.Social participation was also high in AAS registered farmers. Majority of farmers were having marginal land holding in both categories *i.e.*, 72 per cent of AAS registered farmers and 79.3 per cent of non-registered AAS farmers. Agriculture was the main source of income for farmers in both categories in addition to this both category farmers were having subsidiary occupations for their economic stability. The agronet advisories were disseminated to the farmers through various modes of communication like Radio, T.V, Newspapers, AAS bulletins, Mobile and Friends/Relatives (Fig. 2). The major source of information for AAS registered farmers was AAS bulletins (36 per cent) published and issued by AMFU centre of Brahamavar Udupi district., followed by mobile (29 per cent), radio/television (16 per cent), friends/relatives (11 per cent) and newspapers (8 per cent)

respectively.

Table 2: Registered Farmers Perception towards AAS of Udupi District

Farmers Perception statements	Frequency	%
<b>Perception about AAS</b>		
Very poor	34	20.0
Poor	43	22.6
Good	53	35.3
Very good	36	24.0
<b>Perception about necessity of AAS</b>		
Yes	135	90
No	15	10
<b>Perception about for which weather parameter AAS is essential</b>		
Temperature	93	62
Rainfall	128	85.3
Rh	87	58
Wind velocity	68	45.3
<b>Perception about advantage of AAS</b>		
Yes	114	76
No	36	24
<b>Perception about which way you are advantaged from AAS</b>		
Reducing costs	16	10.6
Managing pest and disease	67	44.6
Avoid post harvest loses	59	39.3
Time of harvesting	79	52.6
Scheduling irrigation	63	42
<b>Perception about at which stage of crop AAS is essential</b>		
Planting	20	13.3
Flowering	93	62
Harvesting	115	76.6
Post harvest practices (drying)	76	50.6
<b>Perception about Quality of AAS information disseminated</b>		
Good	67	44.6
Average	60	40
Poor	23	15.3
<b>Perception about willingness for pay based services</b>		
Yes	5	3.3
No	135	90
Undecided	10	6.6
<b>Perception about overall satisfaction from AAS</b>		
Yes	107	71.3
No	43	28.6

Study revealed that Perception on AAS revealed (Table 2) that 35.3 per cent of registered farmers rated the Agro-meteorology advisory services as good followed by Very good (24 percent). The majority of the farmers (90 percent) felt the necessity of the agro-meteorological advisory services. where, 85.3 per cent of them felt that advisories based on predicted precipitation events are very effective and helpful for planning various farm operations in Arecanut

orchards like fertilizer application, spraying and harvesting followed by temperature and relative humidity. Same results were observed in the studies reported by Maddison (2006)<sup>[4]</sup> with respect to precipitation forecast. Majority of the farmers were expressed that the intervention of AAS was helpful in Arecanut production. AAS aids farmers to reduce production cost and crop protection during cropping season. Majority of farmers (76.6 percent) opined that real time AAS was critical at Harvesting stage as information on timely rainfall helped farmers to plan their farm activities timely and accurately.

About 44.6 per cent of farmers perceived that micro-level AAS disseminated through AMFU (Agro-meteorology field unit) centre was good, accurate, timely available. Further farmers showed less interest to pay for AAS services, as majority of respondents were marginal farmers with scarce farm resource and not in position to pay for service. Studies revealed that 71.3 per cent of AAS farmers were satisfied with AAS issued by the AMFU centre of Brahamavar, Udupi district.

**Table 3:** Knowledge Statements of Farmers about AAS

		Registered Farmers	Percentage	Non Registered Farmers	Percentage
Knowledge about AAS	Yes	96	64	59	39.3
	No	54	36	91	60.6
Knowledge about AAS bulletins	Yes	118	78.6	60	40
	No	32	21.3	90	60
Knowledge about GKMS project at zahrs	Yes	84	76	22	14.6
	No	66	24	128	85.4
Knowledge about IMD of India	Yes	90	60	60	40
	No	60	40	90	60
Wanted more knowledge through training/workshop	Yes	113	75.3	81	54
	No	37	24.6	69	46

Table.3 conveys the knowledge of farmers about AgroMet Advisory services and 64 per cent farmers registered with AAS had knowledge about AAS. 39.3 per cent non-registered AAS farmers had knowledge about AAS. 78.6 per cent registered farmers and 40 per cent non- registered farmers had knowledge about AAS bulletins. 76 per cent registered farmers had knowledge about Brahamavar AMFU centre, whereas 14 per cent non-registered farmers had about it. Further, 60 per cent registered and 40 per cent non-registered farmers had knowledge about IMD of India. Finally, 75.3 per cent registered and only 54 per cent non-registered farmers had knowledge about trainings/workshop schedule to be organized by AAS station.

#### 4. Conclusions

Impact assessment is the analysis of the significant change that has occurred due to AAS intervention. This involves what has changed, for whom, how vital the change was, how long the change will last and in what ways our actions have contributed to that change. In the present study it is determined that success of the AAS intervention among Arecanut growers of Udupi district which has positively impacted the beneficiaries and the local community in increasing their farm income especially from Arecanut cultivation. The study indicates that AAS has provided the timely service related to farming operation *i.e.*, Fertilizer application, Bordo spraying, Post harvesting operations which impacted more on small and marginal farmers especially its economic value in terms of money by weather forecast leading to reduction in production cost, energy-saving, enhancing the efficacy of inputs such as fertilizer, pesticide and saving crop and its yield from weather hazards. By consistently delivering actionable weather information, analysis and decision support for farming situations such as pest management through forecast of rainfall, temperature, relative humidity, and wind speed. Water management through rainfall forecasts and crop protection from thermal stress through forecast of extreme temperature condition. Rainfall forecasting especially during drying (post harvest operation) helps them to reduce post harvest loss which in

turn aids good value to their produce.

#### 5. Acknowledgment

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