Usage of Agromet Advisory Services among the Farmers of Y.S.R District of Andhra Pradesh, India.

ABSTRACT:

Weather is one of the most important factors determining the success or failure of agricultural production. It affects every phase of the growth and development of a plant. Extreme weather events like heavy rains, cyclones, heat waves, cold waves, drought, etc cause considerable loss in crop production every year. Because of the above, Agrometeorological Advisory Services (AAS) are being rendered by India Meteorological Department (IMD), Ministry of Earth Sciences (MoES) under Gramin Krishi Mausam Sewa (GKMS). Under this scheme weather information-based, crop/livestock management strategies and operations are dedicated to enhancing crop production and food security. To understand the response of the farmers about weather based weather-based advisories disseminated through mobile phones a survey was conducted by the District Agromet Unit (DAMU) by the Krishi Vigyan Kendra (KVK), Utukur, Andhra Pradesh. A sample size of 200 respondents was selected by employing a proportionate random sampling method. Among the farmers surveyed, the majority of the farmers fully adopted harvesting practices (87.5 %) followed by pest, disease management, and irrigation management practices. Nearly half of the farmers followed nursery management, selection of varieties, and post-harvest management practices. Farmers had a medium level of information processing (47.0 %), storage (60.0 %), and sharing (52.5 %) behaviour.

Keywords: Weather; Agromet Advisory Services; mobile advisories; information storage; information sharing.

1. INTRODUCTION:

"Weather is one of the most important factors determining the success or failure of agricultural production. It affects every phase of growth and development of a plant" [1]. While all other physical factors, inputs, and agronomic practices can be manipulated, the vagaries of weather cannot be controlled. However, adverse effects on crops can often be mitigated. Thus, risk in agricultural operations can be minimized by the provision of weather information properly interpreted for their agricultural significance, containing advisories for farm operations and disseminated well in advance of the impending weather. In view of the above, Agrometeorological Advisory Service (AAS) is being rendered by India Meteorological Department (IMD), Ministry of Earth Sciences (MoES) under Gramin Krishi Mausam Sewa (GKMS). Under this scheme weather information-based, crop/livestock management strategies and operations are dedicated to enhancing crop production and food security. AAS can make a tremendous difference to agriculture production by taking the advantage of benevolent weather and minimizing the adverse impact of malevolent weather.

"IMD is generating and issuing quantitative District / Block level weather forecasts for up to 5 days exclusively for agriculture. The products comprise quantitative forecasts for major weather parameters viz., rainfall, maximum and minimum temperatures, wind speed and direction, relative humidity, and cloudiness. These products are used by the AMFUs / DAMUs for the preparation of district / Block level agromet advisories twice a week, i.e. every Tuesday and Friday, and dissemination to the farming community to help them in taking appropriate decisions for day-to-day farm operation" [2]. "The agriculture sector must produce more food for a growing world population, which is expected to increase from 7 billion to about 9 billion by 2050. Most of the farmers in India are smallholder farmers often with limited access to technologies and resources which leaves them increasingly vulnerable to weather and climate fluctuations. Linking the climatic information with the available technologies and best farming practices is required. Customized, location, and crop-specific actionable information is the requirement of small farmers" [3]. "Inter and intra-seasonal variations in weather/climate carry a considerable impact on the efficiency of agricultural operations such as

planting, weeding, and harvesting, and they also determine the efficacy of the application of inputs such as fertilizers, insecticides, and pesticides. Extreme meteorological events such as droughts and floods, with their potential to increase pest and disease infestations, can cause significant economic losses depending on the stage of crop growth during which they occur. Early forecasts of such events have the potential to help farmers take appropriate remedial measures that could help avoid or reduce economic losses. Timely availability of agrometeorological information and services could facilitate both strategic and tactical decisions in increasing and sustaining agricultural production" [4].

"Along with the public extension services, farmers access information from a variety of other sources. These sources can be divided into formal and informal information networks. The informal networks constitute face-to-face interactions with friends, relatives, other farmers, and extension agents among others. On the other hand, formal sources refer to information that is created specifically for farmers through media such as radio and television-based agricultural programs, telecenters, and mobile-based information services". [5] highlighted limitations to these formal and informal networks and criticized their lack of knowledge or understanding of the farmer's perspective and need for information. It is important to understand the demand for information relating to the agricultural activity of the farmers. "Most farmers have access to a variety of traditional information sources (television, radio, newspapers, other farmers, government agricultural extension services, traders, input dealers, seed companies and relatives), which they regularly access for agricultural information"[6]. "These traditional sources have been an important tool for several decades now. They disseminate scientific and technical agricultural knowledge to the farmers and also help improve the adoption of technologies. They played an important role during the green revolution in the 1970s and 1980s" [7]. "The advancements in Information and Communication Technologies (ICTs) have brought a new opportunity for enhancing access to agricultural advisory and extension services [8]. Mobile phones promise to bring the ICT revolution to previously unconnected populations" [9]. "An array of innovative practices has been developed to fill this gap in extension and advisory service delivery. Approaches that have been used include village-based intermediaries, farmer-to-farmer extension, farmer field schools, or farmer field days, aimed at reaching as many farmers as possible with extension messages. The key difference with traditional extension approaches is the emphasis on participatory learning and action, with more tailor-made services, including facilitation of access to financial services and access to markets. However, the high cost associated with face-to-face extension constrains effective delivery of the service to the farmers, who are often widely distributed" [10]. "The mobile service is more than capable of providing timely, relevant, and accessible advice and is valued by those who have engaged with it, but there is a need to make it more interactive and embed a clear monitoring system to ensure the messages reach the intended audience" [11]. Mobile phones being a low-cost ICT tool can able to deliver accurate, relevant and timely information and agromet advisories to the farming community compared to traditional methods of extension services. The mobile phone also reduces communication cost and can also be a game changer in smallholder agriculture. Making use of the advancement in ICT, most of the technologies are being directly transferred to the farmers' mobile as SMS or Whats App messages. The main objective of the study is to understand the usage pattern of the mobile agromet advisories among the farmers sent through SMS and Whats app groups.

2. MATERIALS AND METHODS

Y.S.R. District is the south eastern district of Andhra Pradesh situated within the geographical co-ordinate of 14°9'40" and 16°0'57" of Northern Latitude and 78° 07'02" and 79° 59'58" Eastern Longitude. The mean sea level varies from 269 to 3787 meters above sea level. Y.S.R district is located at Southern Agro-Climatic zone of Andhra Pradesh. Total Geographical area of the District is 15,379 Sq.Km. District Level AgroMet Units (DAMU) for weather based Advisory services has been established at KVK, Utukur, Kadapa during the year, 2019 for weather forecasting and weather based advisories to farmers. C.K.Dinne, Pendlimarri, Chennur and Khajipeta blocks of YSR district were selected for the study considering diversity in crop coverage and subscribers of the service. The study

sample comprised of 200 farmers (50 from each block). The respondents from each block were selected by employing proportionate random sampling method. An ex-post facto research design was used and structured questionnaire was prepared and administered to collect data, by face-to-face interaction. Data were loaded properly, tabulated and analysed using statistical tools. The utilization pattern of agromet advisory services has been studied focusing the following dimensions viz., Technology adoption, Information processing behaviour, Information storage behaviour and Information sharing behaviour as suggested by [14]. The scoring patterns of the above dimensions are explained here under.

2.1 Technology Adoption

Technology adoption refers to the process of accepting, integrating, and using new technology in society. The process follows several stages, usually categorized by the groups of people who use that technology. There were three categories of respondents namely, 'fully adopted', 'partially adopted', and 'not adopted' with scores of 3, 2and 1 respectively. Percentage analysis was done to get meaningful interpretation of the results.

2.2 Information Processing Behaviour

For information processing behaviour, the respondents were categorized after discussing with farmers, scientists and extension workers. There were three categories of respondents namely, 'often', 'sometime', and 'never' 'provided with scores of 3,2 and 1 respectively. By employing cumulative frequency method, the respondents were categorized as low, medium and high.

2.3 Information Storage Behaviour

For information storage behaviour, six statements were taken into consideration. The statements were finalized by using discussion with farmers, scientists and extension workers. There were three categories of respondents namely, 'often', 'sometime', and 'never' 'provided with scores of 3, 2 and 1 respectively. The scores for all items were summed up to get individual's total score. By employing cumulative frequency method the respondents were categorized as low, medium and high.

2.4 Information Sharing Behaviour

It referred to the extent to which the recommendations as given through the mobile agromet based advisory services were communicated to others by the recipient farmers. To study the information sharing behaviour of the farmers, five statements were taken into consideration. The respondents were narrated about these statements enquiring whether they shared or not. There were three categories of respondents namely, 'often', 'sometime', and 'never' 'provided with scores of 3,2 and 1 respectively. The scores for all items were summed up to get individuals total score. By employing cumulative frequency method the respondents were categorized as low, medium, and high.

3. RESULTS AND DISCUSSION

3.1 Technology Adoption by Farmers

The distribution of respondents according to technology adoption for the use of mobile agromet advisory services is shown in Table 1.

Of the whole sample of 200 farmers, 87.5 % had fully adopted the harvesting practices and about 10 % partially adopted, leaving nearly 2.5 % in the not adopted category. As can be seen from the table 1, almost 75.0 % of the farmers fully adopted pest management practices.The information on disease management practices required by majority (71.0 %) of farmers and observed as most

relevant to their need. The reason for higher number of farmers requiring this information might be due to pest and diseases posing a major threat to them. With regard to the irrigation management practices, time of irrigation at the time crtical stages whether to give or post pone the irrigation, 60.0% of the fully adopted this practice.In case of nutrient management practices, half of the (50.5 %) of the respondents adopted the recommended practice, followed by 27.0 percent of the respondents have 'not adopted' and remaining 22.5 % of the respondents have 'partially adopted' the practices.Partial adoption was observed in selection of crops (44.0 %) , selection of varieties (36.0 %), nursery management practices (30.0 %) and post harvest management practices (30.0%). The practices viz., sowing time and intercultural operations were not adopted by a recognisable portion of the respondents.

This finding conforms with that of [12], [13] where they implied that the farmers were adopting recommended management practices and the majority of the farmers have a medium adoption level regarding improved management practices. The above results revealed the existence of wide variation in the adoption of mobile-based agromet advisories from farmer to farmer. The technologies viz., selection of varieties, nursery management, pest and disease management practices and harvesting practices were fully adopted by most of the respondents. Partial adoption was noticed about the technologies viz., selection of crops, nutrient management practices, intercultural operations, irrigation management practices, and postharvest management practices. The practices viz., intercultural operations were not adopted by a markable portion of the respondents as the stage of the crop for different locations varies with the cropping pattern they adopt. The analysis of the above results showed that the trend of non-adoption was less among the respondents, and the messages originating from DAMU had a high integrity value, which might be one of the reasons for the appreciation trend in the adoption of practices as evident from the survey. Reasons expressed for non-adoption of agromet advisory services are due to their suitability for different farming situations, lack of timely availability of labour and farm machinery for intercultural operations, soil-related problems and farmers unaware of technical names and depending entirely on trade names. The findings are in accordance with [14] and [15]

3.2 Information Processing Behaviour of Farmers

The data on information processing behaviour shows that nearly half of the (47%) respondents were with a medium level of information processing behaviour on mobile agromet advisory services, followed by 29.5 % of respondents had a high level and the rest 23.5 % had a low level of information processing behaviour. This finding is following the findings of [16] where a majority of the farmers have a medium level of information processing behaviour.

3.3 Information Storage Behaviour of Farmers

Distribution of respondents according to information storage behaviour is furnished in Table 2. The results indicates that more than half (60%) of the respondents had medium level, followed by 23 percent of the respondents had low level and the remaining 17 percent of respondents had high level

of information storage behaviour. Hence we could conclude that majority of the respondents possessed a medium level of information storage behaviour which is common in farming society. These findings are in accordance with [14] who reported that 61.50% of the respondents had a medium level of information storage behaviour, followed by 26.0 percent of the respondents with a low level and the remaining 12.5 percent of respondents had a high level of information storage behaviour.

3.4 Information Sharing Behaviour among Farmers

52.5% of the respondents were found with a medium level of information-sharing behaviour on mobile agromet advisory services, followed by 28.5% of respondents who had a high level, and 19% of the respondents low high level of information-sharing behaviour.

Farmers indicated that they were convinced about the accuracy of the information, the main reason they shared it with others. Smallholder farmers felt their knowledge had been increased and marginal farmers reported gaining yield benefits. Women were the keenest to continue to receive information but did not express an opinion on the quality of the service. Respondents gave a range of (free text) answers as to why they were more likely to share information.

The reasons expressed by farmers are benefits they gained or perceived future benefits, service accuracy, and trustworthiness, and continuing to receive such messages could not harm [11] This could be evidenced by the [17] 30 percent of farmers were always sharing livestock-related information with family members followed by 21.7% with neighbours, equal numbers (9.2%) with friends and fellow farmers and 2.5% with Gram Pradhan. A similar response on information sharing behaviour on vegetable farming In Srilanka was also reported by [18]

4. CONCLUSION

From the survey, it can be concluded that harvesting, pest, disease, and irrigation management practices have been the major aspects on which farmers have been found interested to get information. Indeed, the harvesting practices were found to be most preferred as they will help the farmers to plan their harvesting and precautions to be taken while harvesting. Effective utilization of these mobile advisories can improve farming communities and enable the speedy recommendation of the requisite information in a mobile-based user-friendly mode. Farmers had a medium level of information processing, storage, and sharing behaviour.

COMPETING INTERESTS

Authors have declared that no competing interests exist

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Table 1. Grouping of respondents based on adoption of technologies

S.No	Technologies	Fully adopted		Partially adopted		Not adopted	
		Frequency	%	Frequency	%	Frequency	%
1	Sowing time	61	30.5	54	27.0	85	42.5
2	Selection of crops	70	35.0	88	44.0	42	21.0
3	Selection of varieties	90	45.0	72	36.0	38	19.0
4	Nursery management practices	98	49.0	60	30.0	42	21.0
5	Nutrient management practices	101	50.5	45	22.5	54	27.0
6	Inter cultural operations	70	35.0	46	23.0	84	42.0
7	Irrigation management practices	120	60.0	32	16.0	48	24.0
8	Pest management practices	150	75.0	15	7.5	35	17.5
9	Disease management practices	142	71.0	28	14.0	30	15.0
10	Harvesting practices	175	87.5	20	10.0	5	2.5
11	Post-harvest management practices	84	42.0	60	30.0	56	28.0

Table2. Distribution of respondents according to information processing, storage and information sharing behaviour.

Respondent categories	Information processing behaviour		Information storage behaviour		Information sharing behaviour	
	Frequency	%	Frequency	%	Frequency	%
Low	47	23.5	46	23	38	19
Medium	94	47	120	60	105	52.5
High	59	29.5	34	17	57	28.5
Total	200	100	200	100	200	100