

Original Research Article

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Utilization of Agromet Advisory Services to the Farmers under Central Plain Zone and South-Western Semi-Arid Zone of Uttar Pradesh, India

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ABSTRACT

Keywords

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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 crops. Extreme weather events like heavy rains, hailstorm, heat waves, cold waves, drought, etc cause considerable loss in crop production every year. Because of the above, Agromet Advisory Services (AAS) are being rendered by India Meteorological Department (IMD), Ministry of Earth Sciences (MoES) under Gramin Krishi Mausam Sewa (GKMS). In this scheme weather information-based, crops/Vegetable/Horticulture/livestock management strategies and operations are dedicated to enhance crop production and food security. To understand the response of the farmers about weather-based advisories disseminated through SMS, mobile phones/Whatsapp group, personal contact and newspaper a survey was dealigned by the Agromet Field Unit (AMFU) by the C.S. Azad University of Agriculture & Technology, Kanpur Nagar Uttar Pradesh. A sample size of 600 respondents was selected by employing a proportionate random sampling method. Among the farmers surveyed, the majority of the farmers fully adopted harvesting practices (86.5 %) 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 (47.5 %), storage (60.5 %), and sharing (53.8 %) dealing.

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”. 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 harmful 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, wind direction, relative humidity, and cloud covers. These products are used by the AMFUs for the preparation of district / Block level agro met 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-today farm operation". "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 small holder 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". "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 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". "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, tele centers, and mobile based information services" 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". "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 1970 and 1980". "The advancements in Information and Communication Technologies (ICTs) have brought a new opportunity for enhancing access to agricultural advisory and extension services. Mobile phones promise to bring the ICT revolution to previously unconnected populations". "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". "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". Mobile phones being a low-cost ICT tool can able to deliver accurate, relevant and timely information and agro met 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 agro met advisories among the farmers sent through SMS and Whats app groups.

Materials and Methods

Kanpur Nagar is the District of Uttar Pradesh situated within the geographical location of 29° 29' 35" Northern Latitude 80° 18' 25" Eastern Longitude. The mean sea level 125 meters above MSL. Kanpur Nagar district is located at Central plain zone & South-Western Semi-Arid Zone of Uttar Pradesh. AgroMet Field Units (AMFU) for weather based Advisory services 12 Districts and 9 Blocks during the year, 2021 for weather forecasting and weather based advisories to farmers. Kanpur Nagar, Kanpur Dehat, Auraiya, Etawah, Firozabad, Hardoi, Hathras, Kasganj, Lakhimpur Kheri, Sitapur, Mathura, Unnao district and Bhitargaon, Bilhaur, Chaubeypur, Ghatampur, Kakwan, Kalyanpur, Patara, Sarsol, Shivrajpur blocks were selected for the study considering diversity in crop coverage of the service.

The study sample comprised of 600 farmers (50 from each district). The respondents from each district and 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 analyzed using statistical tools. The utilization pattern of agromet advisory services has been studied focusing the following dimensions viz., Technology adoption, Information processing dealing, Information storage dealing and Information sharing dealing as suggested. The scoring patterns of the above dimensions are explained here under.

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 1, 2

and 3 respectively. Percentage analysis was done to get meaningful interpretation of the results.

Information Processing Dealing

For information processing dealing, 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 1, 2 and 3 respectively. By employing cumulative frequency method, the respondents were categorized as high, medium and low.

Information Storage Dealing

For information storage dealing, 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 1, 2 and 3 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 high, medium and low.

Information Sharing Dealing

It referred to the extent to which the recommendations as given through the mobile agro met based advisory services were communicated to others by the recipient farmers. To study the information sharing dealing 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 1, 2 and 3 respectively. The scores for all items were summed up to get individuals total score. By employing cumulative frequency method the respondents were categorized as high, medium and low.

Results and Discussion

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 600 farmers, 86.5 % had fully adopted the harvesting practices and about 10.8 % partially adopted, leaving nearly 2.7 % in

the not adopted category. As can be seen from the Table 1, almost 75.3 % of the farmers fully adopted pest & disease management practices. 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 critical stages whether to give or postpone the irrigation, 60.0% of the fully adopted this practice. In case of nutrient management practices, half of the (50.2%) of the respondents adopted the recommended practice, followed by 27.0 percent of the respondents have 'not adopted' and remaining 22.3% of the respondents have 'partially adopted' the practices. Partial adoption was observed in selection of crops (44.2%), selection of varieties (36.3 %), nursery management practices (31.2%) and post-harvest management practices (32.5%). The practices viz., sowing time and intercultural operations were not adopted by a recognizable portion of the respondents. This finding conforms with that of (Dash, *et al.*, 2020 and Meena *et al.*, 2020) 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 agro met 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 analysis of the above results showed that the trend of non-adoption was less among the respondents, and the messages originating from AMFU 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 agro met 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 (Prabha D. and Arunachalm, 2017 and Sandhu *et al.*, 2012).

Information Processing Dealing of Farmers

The data on information processing dealing shows that nearly half of the (47.5%) respondents were with a medium level of information processing dealing on mobile agro met advisory services, followed by 30.2 % of respondents had a high level and the rest 22.3 % had a low level of information processing dealing. This finding is following the findings of (Kalidasn T and Satheesh Kumar V., 2019) where a majority of the farmers have a medium level of information processing dealing.

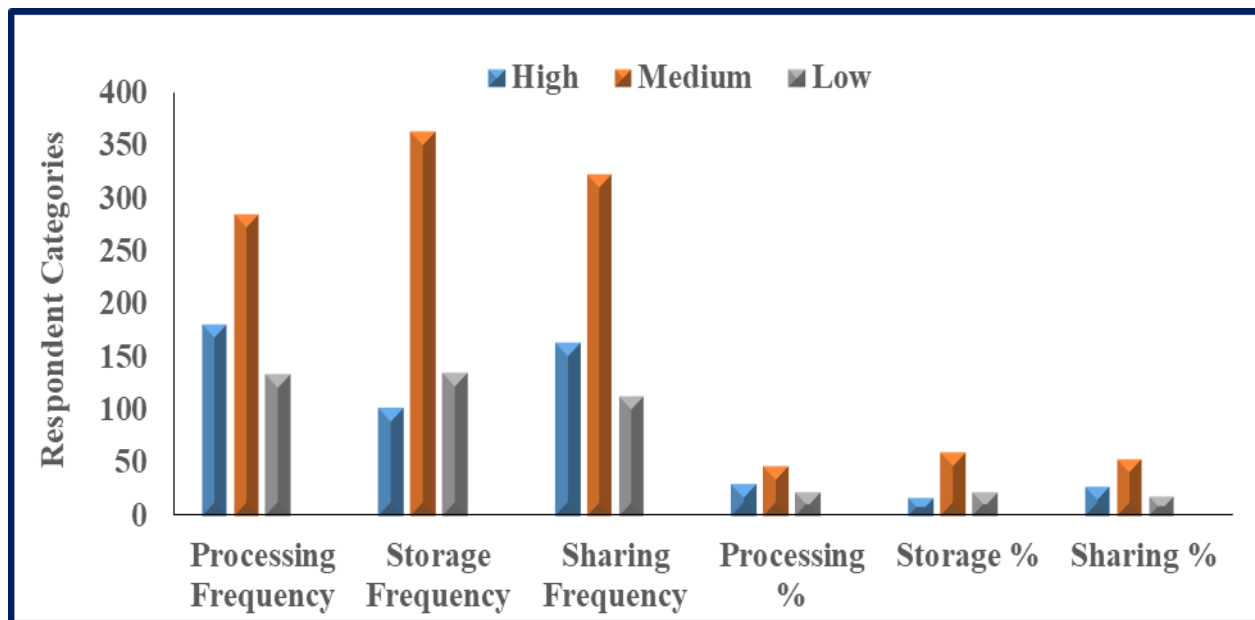
Table.1 Grouping of respondents based on adoption of technologies

S.N	Technologies	Fully adopted		Partially adopted		Not adopted	
		Frequency	%	Frequency	%	Frequency	%
1	Sowing time	186	31.0	162	27.0	252	42.0
2	Selection of crop	210	35.0	265	44.2	125	20.8
3	Selection of Varieties	268	44.7	218	36.3	114	19.0
4	Nursery Management Practices	295	49.2	187	31.2	118	19.7
5	Nutrient Management Practices	301	50.2	134	22.3	165	27.5
6	Irrigation Management Practices	360	60.0	98	16.3	142	23.7
7	Pest & Disease Management Practices	452	75.3	45	7.5	103	17.2
8	Harvesting Practices	519	86.5	65	10.8	16	2.7
9	Post-Harvest Management Practices	258	43.0	195	32.5	147	24.5

Table.2 Distribution of respondents according to information processing, storage and Information sharing dealing.

Respondent categories	Information Processing dealing		Information storage dealing		Information sharing dealing	
	Frequency	%	Frequency	%	Frequency	%
High	181	30.2	102	17.0	164	27.3
Medium	285	47.5	363	60.5	323	53.8
Low	134	22.3	135	22.5	113	18.8
Total	600	100	600	100	600	100

Fig.1 Distribution of respondents according to information processing, storage and Information sharing dealing.



Information Storage Dealing of Farmers

Distribution of respondents according to information storage dealing is furnished in Table 2. The results indicates that more than half (60.5%) of the respondents had medium level, followed by (22.5%) of the respondents had low level and the remaining (17.0%) of respondents had high level of information storage dealing. Hence we could conclude that majority of the respondents possessed a medium level of information storage dealing which is common in farming society. These findings are in accordance with (Prabha D. and Arunachalm, 2017) who reported that 61.50% of the respondents had a medium level of information storage dealing, 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 dealing.

Information Sharing Dealing among Farmers

53.8% of the respondents were found with a medium level of information-sharing dealing on mobile agromet advisory services, followed by 27.3% of respondents who had a high level, and 18.5% of the respondent's low high level of information-sharing dealing. 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 (Monica *et al.*, 2019)

This could be evidenced by the (Varma *et al.*, 2012) 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.

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 dealing.

Author Contributions

Ajay Kumar: Investigation, formal analysis, writing—original draft. C. B. Singh: Validation, methodology, writing—reviewing. Naushad Khan:—Formal analysis, writing—review and editing. Shivam Mishra: Investigation, writing—reviewing.

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical Approval Not applicable.

Consent to Participate Not applicable.

Consent to Publish Not applicable.

Conflict of Interest The authors declare no competing interests.

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