Asian Journal of Agricultural Extension, Economics & Sociology

Volume 41, Issue 10, Page 393-399, 2023; Article no.AJAEES.106912
ISSN: 2320-7027

Awareness and Utilization of Various Weather Based Advisory Services in Western Zone of Tamil Nadu, India

Rathip Kumar J. [a++*], Anandaraja N. [b#], Nirmala Devi M. [c†], Sathyamoorthy N. K. [d#] and Pangayar Selvi. R. [e‡]

[a] Department of Agricultural Extension and Rural Sociology, TNAU, Coimbatore, India.
[b] Training Division, Directorate of Extension Education, TNAU, Coimbatore, India.
[c] Department of Agricultural Extension and Rural Sociology, TNAU, Coimbatore, India.
[d] Agroclimate Research Centre, TNAU, Coimbatore, India.
[e] Department of Physical Sciences and IT, TNAU, Coimbatore, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2023/v41i102183

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/106912

Original Research Article

Received: 16/07/2023
Accepted: 21/09/2023
Published: 22/09/2023

ABSTRACT

Weather-centric crop advisory services offer timely updates on weather trends, crop condition, and recommended actions, empowering farmers to make knowledgeable choices regarding diverse crop management techniques. This ultimately results in improved yields and augmented income. This study was carried out to find the Awareness and Utilization level of various Weather Agro advisory services disseminated through various sources among the farmers. Ex post facto research

[++] PG Scholar;
[#] Professor and Head;
[†] Professor (Agricultural Extension);
[‡] Professor (Mathematics);
**Corresponding author: E-mail: rathipjayabalan21@gmail.com;*

Design was followed in the study. The Salem and Coimbatore district were purposively selected because dissemination of weather information to the farmers in the district through District Agromet units (DAMU). Based on simple random sampling technique 120 respondents were taken for the study. The responses were interpreted using frequency and percentage analysis. Correlation was used to find the relationship between the independent variables and dependent variables using the Statistical packages for Social Sciences (SPSS) software. The result indicates that there was medium level of awareness about 67.5 per cent of respondents and utilization level of about 71.67 per cent of respondents. The variables such as education, extension agency contact, use of media tools, source of weather information are significant and positively correlated to Awareness and utilization The Weather forecast information credibility and accuracy can be increased to high level of awareness and utilization by providing the credible weather data on timely basis.

Keywords: Weather agro advisory services; district agromet units (DAMU); awareness; utilization; correlation.

1. INTRODUCTION

Weather-based Agro Advisory Services (WAAS) are transforming agriculture by utilizing advanced weather data and technology to furnish farmers with essential guidance and suggestions. These services furnish customized, geographically precise details regarding weather trends, empowering farmers to make well-informed choices that refine their farming methods. Through the provision of up-to-the-minute and projected weather data, coupled with specific advice tailored to different crops, WAAS seeks to amplify productivity, mitigate risks, and ultimately contribute to the establishment of sustainable and resilient agricultural systems. This pioneering approach marks a significant stride in the modernization of agriculture, empowering farmers to adapt to evolving climate conditions and elevate their crop yields in an ever-changing and demanding environment. Weather plays a critical role in agriculture, and alterations in weather patterns can greatly impact crop output. Services providing crop advice rooted in weather data deliver prompt information on weather trends, crop status and suggested measures to farmers. This enables them to make informed decisions about crop management methods, ultimately leading to increased yields and income [1]. In 1945, the India Meteorological Department (IMD), operating under the Ministry of Earth Sciences, introduced weather services for Indian farmers with the aim of averting crop failure due to unpredictable weather patterns [2]. The Agrometeorological Advisory Service (AAS) is provided by the India Meteorological Department (IMD), Ministry of Earth Sciences (MoES), through the Gramin Krishi Mausam Sewa (GKMS) program. This initiative aims to contribute to crop and livestock management strategies and operations by leveraging weather information. These advisories are prepared twice a week, specifically on Tuesdays and Fridays, and are then disseminated to the farming community [3]. Within the GKMS initiative, there is an increasing emphasis on employing crop simulation models to determine optimal crop management approaches based on prevailing weather conditions. This development aims to assist farmers and planners in making informed tactical and strategic decisions, particularly concerning irrigation scheduling and effective water management in both irrigated and rainfed agricultural systems [4] The Agromet Advisory Services are instrumental in Agriculture and its associated activities. They offer essential information regarding all stages of agricultural operations, spanning from land preparation to post-harvesting activities, about 66% of crop production will be influenced by Agrometeorological factors.The primary objective of AAS is to diminish agricultural losses and elevate farmers' income through the integration of modern agricultural technologies [5,6] To facilitate research on crops, pests, diseases, soil, agroforestry, livestock, horticulture, agriculture physics, and soil science, ICAR establishes Agromet observatories and Automated Weather stations (AWS) at its Krishi Vigyan Kendras (KVKs). The information generated from these sources helps in examining the correlation between crops and weather, as well as the connection between crop conditions, weather patterns, and pest/disease occurrences [7-9]. Nesheim et al. [10], the value of information to farmers is influenced by factors such as its accessibility, relevance, and reliability.

2. METHODOLOGY

The study was carried out in two districts namely Salem and Coimbatore which was purposively

selected based on the dissemination of weather agro advisory services through District Agromet units (DAMU) present in Krishi Vigyan Kendra (KVK) and Agroclimate research centre, TNAU.Among 120 respondents ,60 respondents from each district were selected .Two Blocks in each district was purposively selected based on the maximum users of weather information disseminated through the District Agromet Units (DAMU) namely Ayothiyapattinam, Attur blocks in salem district and Anaimalai ,Pollachi North blocks in coimbatore district. Two villages were purposively selected in each block based on the maximum number of farmers in a village. Totally four villages were selected in each district. The respondents were selected by simple random sampling technique.

Awareness and Utilization of Weather Advisory services was assessed among the 120 respondents. Awareness of weather advisory services was assessed among the respondents with scoring procedure of aware with score of 2 and not aware with score of 1. The Awareness level was categorized based on the mean score into Low,Medium,High categories . Utilization of weather advisory services was also assessed with scoring procedure of three-point continuum of always, whenever needed and never with score of 3,2,1 respectively. The Utilization level was aslo categorized based on the mean score into Low,Medium,High categories .With the total score of awareness and utilization of 120 respondents, Correlation analysis had been done through the Statistical Package for Social Sciences (SPSS).

3. RESULTS AND DISCUSSION

3.1 Profile Characters of Respondents

Table 1. Profile characters of respondents

S. No.	Independent variables	Category	Respondents	
			N	%
1.	Age	Young (35 and below)	07	05.83
		Middle (36 to 55 years)	65	54.17
		Old age (55 years and above	48	40.00
2.	Education	Primary	05	04.16
		Middle	21	17.50
		Secondary	42	35.00
		Higher secondary	20	16.67
		Diploma	07	05.83
		Collegiate	25	20.83
3.	Land holdings	Marginal land holders small land	26	21.67
		holders	42	35.00
		Large land holders	52	43.33
4.	Extension agency contact	Low	19	15.83
		Medium	77	64.16
		High	24	20.00
5.	Use of media tools	Low	10	8.33
		Medium	95	79.17
		High	15	12.50
6.	Sources of weather information	Low	20	16.67
		Medium	78	65.00
		High	22	18.33

3.2 Awareness Level of Weather Based Agro Advisory Services

Table 2. Awareness of weather advisory services among the respondents

(n=120)

Sl. No.	Category	Frequency	Percentage
1	Low	31	25.83
2	Medium	81	67.50
3	High	08	6.67

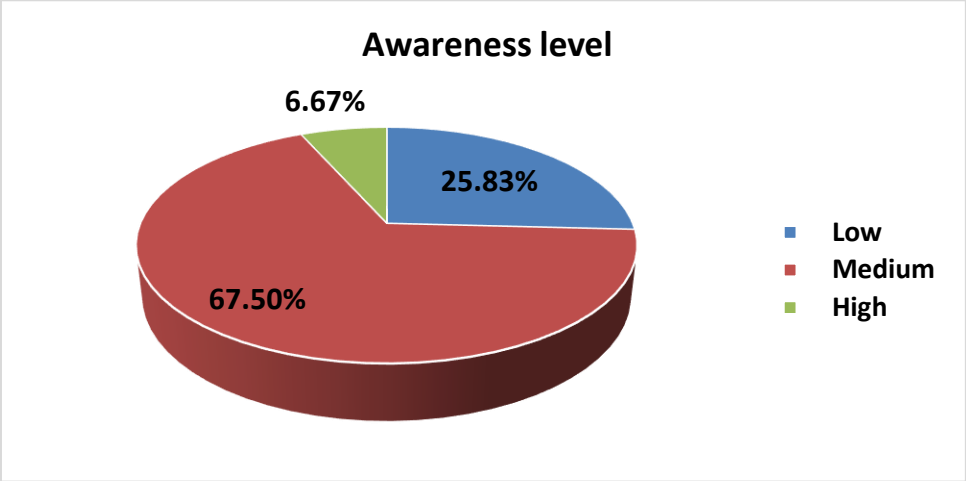

Fig. 1. Distribution of respondents based on the Awareness level

From Table 2 Awareness level of respondents towards the sources of the weather advisory services is found to be medium level among the respondents, while aspect wise of awareness level, the respondents were aware about Radio, Television, Newspaper, Uzhavan app, Private sources but they were not aware about the various recent mobile application and websites providing the weather advisory services like MAUSAM app, Meghdoot app, IMD website etc.

3.2.1 Relationship between the independent variables and awareness level of respondents

Table 3. Correlation coefficient of independent variables with Awareness level

(n=120)

Sl. No.	Independent variables	Correlation coefficient
1.	Age	-0.130
2.	Education	0.258**
3.	Landholdings	0.214*
4.	Extension agency	0.236**
5.	Farming experience	-0.109
6.	Cropping pattern	-0.104
7.	Irrigation facilities	0.163
8.	Use of media tools	0.402**
9.	Crop insurance	-0.044
10.	Labour availability	0.046
11.	Marketing facilities	0.107
12.	Source of weather information	0.666**
13.	Attitude towards the weather Advisories	-0.029

*** Significant at 1% level*
** Significant at 5 % level*

From Table 3 it is inferred that the sources of weather information(r=0.666) are more significant and positively correlated due to the need of weather forecast information for agricultural activities followed by the usage of media tools (r=0.402) which is positively correlated and significant due to majority of respondents use the mass media and modern ICT tools like Television, Newspaper, Mobile phones with usage of WhatsApp, YouTube, Facebook and other search engines like Google which were accessed for various day to day activities and education (r=0.214) is also positively correlated and significant to the awareness level of respondents because even though about one third of respondents (35%) had secondary level of education. Even though they had secondary level of Education about 80 per cent of respondents they are aware about smartphones for various activities in their day-to-day life and majority of respondents lies between the middle level of education to collegiate education category, so they are aware with the various weather advisory services which are given through the WhatsApp, YouTube, Facebook etc. Extension agency had positive correlation and significant to the awareness level due to respondents' interaction with neighbours, friends' relative's majority of respondents are the members of farmers producers' company so they were aware about the weather based advisory service. Land holdings (r=0.214) is positively correlated and significant to awareness due to the majority of respondents belongs to the large land holders (above 5 acres) so they were aware of weather based advisory services.

3.3 Utilization Level of Respondents towards the Weather Advisory Services

The respondents are aware about the various weather advisory services sources and the respondents also utilize the sources on three-point continuum always whenever needed and never with score level of 3,2,1 respectively. The extent of utilization with regards to weather advisory services is 44.11 per cent. The utilization is categorized into low, medium, high level based on the obtained and total score among the respondents which is tabulated below:

Table 4. Utilization level of weather advisory services among the respondents

(n=120)

Sl. No.	Category	Percentage
1.	Low	18.33
2.	Medium	71.67
3.	High	10.00

From the Table 4 it is concluded that about less than three fourth of respondents (71.67%) had medium level of utilization followed by less than one fifth of respondents (18.33%) had low level of utilization and about one tenth of respondents (10%) had high level of Utilization level. The respondents utilize the various weather advisory sources like Newspaper, Television, YouTube, WhatsApp, Google weather, Uzhavan, WhatsApp messages through the district agromet units and other sources like weatherman and accuweather app for Crop production, Crop protection, Harvesting and Marketing.

3.3.1 Correlation of independent variables with utilization level

It could be inferred from the Table 5. That Education (r=0.689) is highly significant and correlated with utilization of weather based Agro Advisory services because about 35 per cent had secondary level of education and majority of respondents lies between the medium level of education to collegiate education so they utilize the various sources related to the weather advisory services given through Newspaper, Television. Use of media tools (r=0.351) had positive relationship and highly significant to utilization because maximum of respondents uses various media tools such as Selva Kumar YouTube channel, weatherman, Google Weather for accessing various weather information in day-to-day activities. Land Holding (r=0.262) had positive relationship and highly significant because majority of respondents lies between small and large land holders as they various crops in their field so the weather information is important .Source of weather information (r=0.262) is positively correlated and highly significant due to the need of weather information needed for crop production activities and allied activities and cropping pattern (r=-0.210*) is negatively correlated and significant as the respondents grow perennial crops like coconut, flower crops like Jasmine, Nerium they don't prefer the weather information**.** Farming experience (r= -0.209*) showed negative correlation with utilization of weather based Agro

Table 5. Relationship between independent variables and utilization level of respondents

(n=120)

Sl. No.	Independent variables	Correlation coefficient
1.	Age	-0.163
2.	Education	0.689**
3.	Land holdings	0.283**
4.	Extension Agency contact	0.143
5.	Farming experience	-0.209*
6.	Cropping pattern	-0.210*
7.	Irrigation facilities	-0.043
8.	Use of media tools	0.351**
9	Crop Insurance	-0.131
10	**Labour availability**	**0.190**
11	Marketing Facilities	0.064
12	Source of weather information	0.262**
13	Attitude towards weather Advisories	-0.001

*** Significant at 1% level*

** Significant at 5 % level*

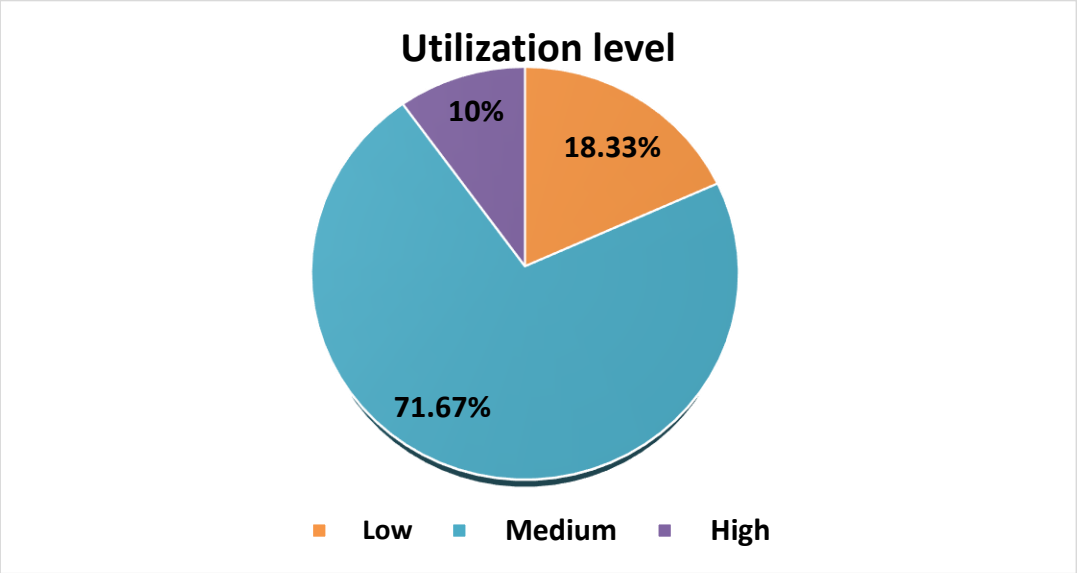

Fig. 2. Distribution of respondents based on the utilization level

advisory services. Since most of the respondents belong to medium and old category with low to medium level of education and high level of exposure to weather related traditional knowledge, So with high farming experience resulted in low level of utilization of weather based Agro Advisory services.

4. CONCLUSION

Weather based advisory services as a whole was important for predicting the climate change. The findings of the study were found to be medium level of Awareness and Utilization so necessary steps had to be taken for improving the credibility of weather data when there is an improvement in accuracy disseminated by various weather Agro advisory services there may be improvement in Awareness and Utilization of weather Advisory services. Village level weather forecast can be implemented so the weather data are useful and accurate to the farmers. weather forecast data in appropriate time and would help the respondents in planning the various agricultural activities in order to reduce the farm loss in day-to-day activities.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/106912