

Impact of Agro Advisory Services of District Agro Meteorological Units (DAMU) of Krishi Vigyan Kendra's in Southern Karnataka

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ABSTRACT

Weather variability and climate change increasingly threaten agricultural production in rain-fed regions of India. To address weather-related risks, the Indian Meteorological Department (IMD), in collaboration with the University of Agricultural Sciences, Bangalore, established District Agro-Meteorological Units (DAMUs) at Krishi Vigyan Kendras (KVKs) for dissemination of location-specific weather forecasts and agro-advisories. The present study evaluated the impact of DAMU agro-advisory services in Southern Karnataka. The study was conducted in Tumkur, Ramanagara, Mandya and Chamarajanagara districts, where DAMUs have been functioning since 2019–20. An ex-post facto and exploratory research design was employed, and 120 farmers (30 from each district) receiving DAMU advisories were selected through purposive sampling. Data were collected using a structured interview schedule and analyzed using descriptive statistics. Results indicated that the four DAMUs together reached 95,441 farmers through digital platforms such as WhatsApp, Facebook and the Meghdoot application. Most respondents were middle-aged, small and marginal farmers with moderate to higher educational levels. Awareness about climate change was high (86.67 %), and KVK–DAMU units were the principal source of agrometeorological information for 96.67 per cent of the respondents. Adoption of DAMU advisories was very high (98.33 %), and a similar proportion perceived the advisories as useful. The advisories significantly influenced major farm operations, particularly harvesting, spraying and irrigation scheduling. Economic benefits due to advisory adoption ranged from Rs. 5,000 to above Rs. 20,000 per season. The study highlights the effectiveness of DAMU-based agro-advisory services in improving farm-level decision-making, reducing weather-related risks and enhancing farm income in Southern Karnataka.


Keywords: Agro-advisory services, DAMU, agrometeorology, climate change, farmer adoption, Karnataka

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Introduction

Agriculture in India is highly sensitive to weather and climate variability, as a substantial proportion of cropped area is rain-fed and dependent on the southwest monsoon. Variations in rainfall distribution, rising temperatures and increasing frequency of extreme weather events such as droughts, heat waves and unseasonal rainfall have intensified production risks and livelihood insecurity among farming communities. Climate change has further aggravated these challenges by increasing the unpredictability of weather patterns, making farm planning and timely decision-making more complex, particularly for small and marginal farmers.

Weather-induced risks affect all stages of crop production, including sowing, irrigation scheduling, nutrient management, pest and disease incidence, and harvesting operations. In the absence of timely and location-specific weather information, farmers often suffer avoidable yield losses and increased production costs. Therefore, the provision of reliable weather forecasts coupled with crop- and location-specific agro-advisories has emerged as a critical strategy for enhancing climate resilience and improving farm productivity.

Early warning systems (EWS) have become crucial in managing the increasing uncertainties of weather patterns caused by climate change. These systems help to provide timely and accurate information, allowing farmers and other stakeholders to make informed decisions that can mitigate the impact of extreme weather events. Indian Meteorological Department (IMD), Government of India in collaboration with the University of Agricultural Sciences, Bangalore established four District Agro-Meteorological Units (DAMUs) at Krishi Vigyan Kendras of Tumkur, Ramanagara, Chamarajanagara, and Chikkaballapura districts during the year 2019-20. A forecast of twice a week (Tuesday and Friday) for the next succeeding five days on weather parameters such as taluka-wise rainfall, temperature, relative humidity etc., is disseminated through the newspaper, Radio, TV, SMS, WhatsApp, and Facebook. Hence, measuring and documenting the impact of these agro-advisory services is crucial in understanding the extent of benefits the farmers received in improving their agricultural outcomes.

Objectives of the Research

1. To consolidate the data on District wise DAMUs operations in terms of number of advisories, area covered, number of farmers and EWs covered, etc.,
2. To measure the extent of the impact of weather forecasting parameters and agro-advisories on farmers and EWs

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3. To enlist the constraints faced by farmers and EWs in utilizing the weather parameters and agro-advisories

Review of literature

Agrometeorological advisory services (AAS) in India have undergone significant development from generalized weather bulletins to structured, location-specific advisory systems such as District Agro-Meteorological Units (DAMUs) (Rathore et al., 2014). Studies have emphasized that weather-based agro-advisories play a crucial role in improving farmers' decision-making under climate variability by guiding timely operations such as sowing, irrigation, plant protection and harvesting (Singh et al., 2018). Empirical evidence from Karnataka indicates that farmers receiving agrometeorological advisories achieved higher crop yields and economic returns compared to non-beneficiaries (Nannewar et al., 2020). Similarly, Kanimolzhi et al. (2023) reported a high level of adoption of DAMU advisories among farmers in Tamil Nadu, particularly for scheduling critical farm operations. Farmer perception studies conducted in Andhra Pradesh and Telangana revealed that timely weather advisories helped reduce production losses and input costs while enhancing farm profitability (Ushasri et al., 2022). Studies from West Bengal and Maharashtra further confirmed that regular use of agrometeorological advisories contributed to increased net returns and improved livelihood security, highlighting the effectiveness of AAS in promoting climate-resilient agriculture (Thakur et al., 2020).

Methodology

The present study was carried out in four districts of Southern Karnataka, namely Tumkur, Ramanagara, Mandya and Chamarajanagara, where District Agro-Meteorological Units (DAMUs) were established at Krishi Vigyan Kendra's (KVKs) during 2019–20 under the University of Agricultural Sciences, Bangalore. These districts represent diverse agro-climatic situations and are predominantly dependent on monsoon rainfall, making them suitable for assessing the impact of agro-meteorological advisory services.

An ex-post facto and exploratory research design was adopted, as the DAMU agro-advisories had already been disseminated to farmers prior to the conduct of the study. The investigation also incorporated case documentation and video documentation to supplement quantitative findings and capture experiential evidence of advisory use.

Sl. No.	District	KVK-DAMU	Sample	Villages and sampling
1	Tumkur	KVK, Konehalli, Tiptur	30	Purposive sampling
2	Ramanagara	KVK, Magadi	30	
3	Chamarajanagara	KVK, Haradanahalli	30	
4	Mandya	KVK, Mandya	30	
Total sample			120	

The respondents for the study comprised farmers who were regular recipients of DAMU agro-advisories. A purposive sampling technique was employed for the selection of respondents. From each district, 30 farmers were selected, resulting in a total sample size of 120 respondents. In addition, extension personnel associated with DAMU operations were consulted to provide supporting qualitative information.

Primary data were collected through personal interviews using a pre-tested structured interview schedule developed in accordance with the objectives of the study. The schedule included items related to socio-economic characteristics of respondents, awareness of climate change, sources of agricultural information, extent of adoption and use of DAMU advisories, perceived usefulness, influence of advisories on farming operations, economic benefits derived and constraints faced in utilizing the advisories.

The data collected were coded, tabulated and analysed using descriptive statistical techniques such as frequency and percentage. The results were presented in tabular form to facilitate comparison across districts and to assess the overall impact of DAMU agro-advisory services.

Results and Discussion

KVK wise DAMU details

The data presented in table 1 depicts the KVK wise details of DAMU working under UAS, Bangalore. It is clear from the table 1 that, 35,000 farmers are reached through WhatsApp, Facebook and Meghdoot app by DAMU of KVK, Tumkur followed by DAMU of KVK Mandya covering 26,560 farmers through 79 WhatsApp groups, Facebook and Meghdoot app. DAMU of KVK Chamarajanagara and KVK Ramanagar are covering 19,821 and 14,060 farmers respectively through various social medias. In total the 4 DAMU units are covering a total of 95,441 farmers across 4 districts.

Table 1: KVK wise DAMU details

Sl. No	KVK'S	Social medias utilized for dissemination of advisories	No of farmers reached	Total no of farmers reached
1	Ramanagar	Whatsapp	5,063	14,060
		Face book	4,947	
		Megadhoot app	4,050	
2	Tumkur	Whatsapp	35,000	35,000
		Face book		
		Megadhoot app		
3	Mandya	Whatsapp	79 groups	26,560
		Face book	24,510	
		Megadhoot app	2,050	
4	Chamarajanagar	Whatsapp	19,821	19,821
		Face book		
		Megadhoot app		
			Total	95,441

Socio-Economic characteristics of respondents**Table 2: Age category of farmers**

(N=120)

Sl. No	Age category (years)	Ramanagar (n ₁ =30)		Tumkur (n ₂ =30)		Mandya (n ₃ =30)		Chamaraja nagar (n ₄ =30)		Total (n=120)	
		No.	%	No.	%	No.	%	No.	%	No.	%
1	Young (up to 35)	10	33.33	13	43.33	11	36.67	15	50.00	49	40.83
2	Middle (36-50)	18	60.00	13	43.33	16	53.33	12	40.00	59	49.17

3	Old (>50)	2	6.67	4	13.33	3	10.00	3	10.00	12	10.00
	Total	30	100.00	30	100.00	30	100.00	30	100.00	120	100.00

It is clear from the results presented in table 2 that, in Ramanagar district majority (60.00 %) of the respondents belonged to middle aged category followed by young (33.33 %) and old age (6.67 %) categories respectively. In Tumkur district equal (43.33 %) percent of the respondents belonged to young and middle-aged categories followed by old age category (13.33 %). In Mandya district, slightly more than half (53.33 %) of the respondents belonged to middle aged category followed by young (36.67 %) and old (10.00 %) age categories respectively. In Chamarajanagar half (50.00 %) of the respondents belonged to young age category followed by middle (40.00 %) and old (10.00 %) age categories respectively. In total nearly half (49.17 %) of the respondents belonged to middle aged category followed by young (40.83 %) and old (10.00 %) age categories respectively.

Table 3: Educational status of farmers

Sl. No	Educational categories	Ramanagar (n ₁ =30)		Tumkur (n ₂ =30)		Mandya (n ₃ =30)		Chamaraja nagar (n ₄ =30)		Total (n=120)	
		No	%	No	%	No	%	No	%	No	%
1	Illiterate	1	3.33	2	6.67	0	0.00	1	3.33	4	3.33
2	Literate	3	10.00	0	0.00	1	3.33	0	0.00	4	3.33
3	Primary school	2	6.67	0	0.00	0	0.00	2	6.67	4	3.33
4	Middle school	3	10.00	0	0.00	0	0.00	1	3.33	4	3.33
5	High school	8	26.67	9	30.00	11	36.67	1	3.33	29	24.17
6	PUC/Diploma/ITI	7	23.33	10	33.33	9	30.00	9	30.00	35	29.17
7	Degree	6	20.00	8	26.67	3	10.00	16	53.33	33	27.50
8	Post graduate	0	0.00	1	3.33	6	20.00	0	0.00	7	5.83

With respect to educational status of the respondents, the data in table 3 reveals that, in Ramanagar district slightly more than 25.00 percent of the respondents were educated up to high school followed by PUC/Diploma/ITI (23.33 %), Degree (20.00 %) and Middle school (10.00 %) respectively. In Tumkur district

one third (33.33 %) of the respondents were educated up to PUC/Diploma/ITI followed by high school (30.00 %) and degree (26.67 %). In Mandya district, 36.67 percent of the respondents were educated up to high school followed by PUC/Diploma/ITI (30.00 %) and post-graduation (20.00 %). In Chamarajanagar district slightly more than half (53.33 %) of the respondents were educated up to degree followed by PUC/Diploma/ITI (30.00 %) and primary school (6.67 %). In total almost equal per cent of the respondents were educated up to PUC/Diploma/ITI (29.17 %) and degree (27.50 %) followed by high school (24.17 %) and post-graduation (5.83 %).

Table 4: Land holding status of farmers

Sl. No	Type of farmer	Ramanagar (n ₁ =30)		Tumkur (n ₂ =30)		Mandya (n ₃ =30)		Chamarajanaagar (n ₄ =30)		Total (n=120)	
		No	%	No	%	No	%	No	%	No	%
1	Landless	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
2	Marginal (<2.5 acre)	15	50.00	12	40.00	12	40.00	11	36.67	50	41.67
3	Small (2.5-5.00 acre)	12	40.00	12	40.00	16	53.33	16	53.33	56	46.67
4	Medium (5.00 - 10.00 acre)	3	10.00	6	20.00	2	6.67	2	6.67	13	10.83
5	Large (>10.00 acre)	0	0.00	0	0.00	0	0.00	1	3.33	1	0.83

The details pertaining to land holdings of the respondents is presented in table 4. The results revealed that, in Ramanagar district half of the respondents belonged to marginal land holders category followed by small (40.00 %) and medium (10.00 %) land holders category. In Tumkur district equal (40.00 %) per cent of the respondents belonged to marginal and small land holders category followed by medium land holders category (20.00 %). In Mandya district slightly more than half (53.33 %) of them belonged to small land holders category followed by marginal (40.00 %) and medium (6.67 %) land holders category. In Chamarajanagar district slightly more than half (53.33 %) of them belonged to small land holders category followed by marginal (36.67 %) and medium (6.67 %).

land holders category. Overall majority (46.67 %) of the respondents belonged to small land holders category followed by marginal (41.67 %) and medium (10.83 %) land holders category respectively.

Awareness of farmers on climate change

Table 5: Awareness of farmers on climate change

Sl. No	Awareness	Ramanagar (n=30)		Tumkur (n=30)		Mandya (n=30)		Chamaraja nagar (n=30)		Total (n=120)	
		No	%	No	%	No	%	No	%	No	%
1	Aware	18	60.00	28	93.33	28	93.33	30	100.00	104	86.67
2	Not aware	12	40.00	2	6.67	2	6.67	0	0.00	16	13.33

The data presented in table 5 regarding awareness of farmers on climate change revealed that, cent per cent of Chamarajanagar farmers, 93.33 per cent of Tumkur and Mandya farmers and 60 per cent of Ramanagar district farmers are aware of the climate change. Overall majority (86.67 %) of the farmers are aware of the climate change in the districts.

Sources of information on agriculture related aspects

Table 6: Sources of information on agriculture related aspects

Sl. No	Source of information	Ramanagar (n ₁ =30)		Tumkur (n ₂ =30)		Mandya (n ₃ =30)		Chamaraja nagar (n ₄ =30)		Total (n=120)	
		No	%	No	%	No	%	No	%	No	%
1	Own Experience	0	0.00	4	13.33	0	0.00	29	96.67	33	27.50
2	Agriculture/Horticulture/sericulture Officer	3	10.00	7	23.33	3	10.00	19	63.33	32	26.67
3	TV News	0	0.00	1	3.33	1	3.33	0	0.00	2	1.67
4	Newspaper	1	3.33	2	6.67	14	46.67	2	6.67	19	15.83
5	Radio	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

6	KVK & DAMU unit	29	96.67	27	90.00	30	100.00	30	100.00	116	96.67
8	All of the above	0	0.00	2	6.67	0	0.00	0	0.00	2	1.67

The data in table 6 depicts the sources contacted by the respondents for obtaining information about agriculture related aspects. It is clear from the table that, in Ramanagar great majority (96.67 %) of the respondents contacted KVK & DAMU unit for obtaining information followed by Agriculture/Horticulture/sericulture Officer (10.00 %). In Tumkur district great majority (90.00 %) of the respondents contacted KVK & DAMU unit for obtaining information followed by Agriculture/Horticulture/sericulture Officer (23.33 %) and own experience (13.33 %). In Mandya district cent per cent of them contacted KVK & DAMU unit for obtaining information followed by Newspaper (46.67 %) and Agriculture/Horticulture/sericulture Officer (10.00 %). In Chamarajanagar district cent per cent of them contacted KVK & DAMU unit for obtaining information followed by Own Experience (96.67 %) and Agriculture/Horticulture/sericulture Officer (63.33 %). In total a great majority (96.67 %) of the respondents contacted KVK & DAMU unit for obtaining information on agriculture related aspects followed by own experience (27.50 %), Agriculture/Horticulture/sericulture Officer (26.67 %) and Newspaper (15.83 %).

Adoption of advisories given by DAMU units

Table 7: Adoption of advisories given by DAMU units

Sl. No	Extent of Adoption	Ramanagar (n ₁ =30)		Tumkur (n ₂ =30)		Mandya (n ₃ =30)		Chamaraja nagar (n ₄ =30)		Total (n=120)	
		No	%	No	%	No	%	No	%	No	%
1	Adopted	30	100.00	29	96.67	29	96.67	30	100.00	118	98.33
2	Not adopted	0	0.00	1	3.33	1	3.33	0	0.00	2	1.67

It is evident from the results presented in table 7 that, cent percent of the respondents adopted the advisories given by the DAMU unit in Ramanagar and Chamarajanagar districts. Equal per cent (96.67 %) of the respondents in Tumkur and Mandya districts adopted the advisories provided by the DAMU units. Overall, great majority (98.33 %) of them adopted the messages/advisories provided by the DAMU units.

Perceived usefulness of advisories

Table 8: Perceived usefulness of advisories

Sl. No	Usefulness	Ramanagar (n ₁ =30)		Tumkur (n ₂ =30)		Mandya (n ₃ =30)		Chamaraja nagar (n ₄ =30)		Total (n=120)	
		No	%	No	%	No	%	No	%	No	%
1	useful	29	96.67	30	100.00	29	96.67	30	100.00	118	98.83
2	Not useful	1	3.33	0	0.00	1	3.33	0	0.00	2	1.67

The data presented in table 8 revealed the usefulness of messages/advisories as perceived by the respondents. It is evident that, cent per cent of the respondents in both Tumkur and Chamarajanagar districts perceived that the messages/advisories provided by the DAMU units are useful. A great majority (96.67 %) of respondents in Ramanagar and Mandya districts perceive that the messages/advisories provided by the DAMU units are useful. Overall great majority (98.33 %) of respondents found the messages/advisories provided by the DAMU units are useful.

Economic benefit derived due to adoption of advisories provided by the DAMU units

Table 9: Economic benefit derived due to adoption of advisories provided by the DAMU units

Sl. No	Economic benefit	Ramanagar (n ₁ =30)		Tumkur (n ₂ =30)		Mandya (n ₃ =30)		Chamaraja nagar (n ₄ =30)		Total (n=120)	
		No	%	No	%	No	%	No	%	No	%
1	5000 - 10,000	25	83.33	15	50.00	19	63.33	0	0.00	59	49.17
2	10,001 - 15,000	4	13.33	6	20.00	8	26.67	0	0.00	18	15.00
3	15,001 - 20,000	1	3.33	6	20.00	2	6.67	0	0.00	9	7.50
4	Above 20,000	0	0.00	3	10.00	1	3.33	30	100.00	34	28.33

It can be seen from the table 9 that, in Ramanagar district majority (83.33 %) of the respondents got an economic benefit of 5000-10000 followed by 10001-15000 (13.33 %) and 15001-20000 (3.33 %) due to adoption of advisories sent

by DAMU units. In Tumkur district half of the respondents got an economic benefit of 5000-10000 followed 10001-15000 (20.00 %) and 15001-20000 (20.00 %). In Mandya district majority (63.33 %) of the respondents got an economic benefit of 5000-10000 followed by 10001-15000 (26.67 %) and 15001-20000 (6.67 %). In Chamarajanagar district cent percent of the respondents derived an economic benefit of more than 20000 due to adoption of advisories. Overall slightly less than half (49.17 %) of them derived an economic benefit of 5000-10000 followed by above 20000 (28.33 %) and 10001-15000 (15.00 %).

Usefulness of training programmes organized by DAMU units

Table 10: Usefulness of training programmes organized by DAMU units

Sl. No	Usefulness	Ramanagar (n ₁ =30)		Tumkur (n ₂ =30)		Mandya (n ₃ =30)		Chamarajanaagar (n ₄ =30)		Total (n=120)	
		No	%	No	%	No	%	No	%	No	%
1	Useful	30	100.00	30	100.00	30	100.00	30	100.00	120	100.00
2	Not Useful	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

The data in table 10 revealed that, cent per cent of the respondents in all the four districts viz., Ramanagar, Tumkur, Mandya and Chamarajanagar perceived that the awareness training programmes conducted by DAMU units are useful.

Extent of use of advisories sent by DAMU units

Table 11: Extent of use of advisories sent by DAMU units

Sl. No	Extent of use	Ramanagar (n ₁ =30)		Tumkur (n ₂ =30)		Mandya (n ₃ =30)		Chamarajanaagar (n ₄ =30)		Total (n=120)	
		No	%	No	%	No	%	No	%	No	%
1	Daily	0	0.00	2	6.67	0	0.00	0	0.00	2	1.67
2	Weekly twice	27	90.00	22	73.33	0	0.00	28	93.33	77	64.17
3	Weekly once	2	6.67	2	6.67	8	26.67	2	6.67	14	11.67
4	Fort-night	1	3.33	4	13.33	22	73.33	0	0.00	27	22.50

The data regarding extent of use of advisories sent by DAMU units is presented in table 11 and it reveals that, high majority (90.00 %) of the respondents in Ramanagar district use the advisories sent by the DAMU units weekly twice followed by weekly once (6.67 %) and once in fortnight (3.33 %). In Tumkur district majority (73.33 %) of them use the advisories sent by the DAMU units weekly twice followed by fortnight (13.33 %), daily and weekly once (6.67 %) respectively. In Mandya district nearly three fourth (73.33 %) of them use the advisories once in fortnight followed by weekly once (26.67 %) and in Chamarajanagar district high majority (93.33 %) of them use the advisories weekly twice. Overall majority (64.17 %) of the respondents use the advisories sent by DAMU units weekly twice followed by fortnight (22.50 %) and weekly once (11.67 %).

Effect of advisories on farming operations as expressed by the respondents

Table 12: Effect of advisories on farming operations as expressed by the respondents

Sl. No	Effect	Ramanagar (n ₁ =30)		Tumkur (n ₂ =30)		Mandya (n ₃ =30)		Chamarajanaagar (n ₄ =30)		Total (n=120)	
		No	%	No	%	No	%	No	%	No	%
1	Sowing operations	1	3.33	17	56.67	6	20.00	9	30.00	33	27.50
2	Irrigation schedule	3	10.00	9	30.00	23	76.67	13	43.33	48	40.00
3	Fertilizers application	6	20.00	6	20.00	11	36.67	7	23.33	30	25.00
4	Spraying operations	26	86.67	9	30.00	19	63.33	21	70.00	75	62.50
5	Harvesting operations	28	93.33	13	43.33	21	70.00	27	90.00	89	74.17

The data presented in table 12 depicts the effect of advisories sent by DAMU units on agricultural operations carried out by the respondents. It is evident from the table that, in Ramanagar district majority (86.67 %) of the respondents expressed the fact that the messages sent by DAMU units has influenced their harvesting operations followed by spraying operations (86.67 %), fertilizer application (20.00 %) and scheduling of irrigation (10.00 %). In Tumkur district slightly more than half (56.67 %) of the respondents expressed the fact that the messages sent by DAMU units has influenced

their sowing operations followed by harvesting operations (43.33 %), irrigation schedule and spraying operations (30.00 %) and fertilizers application (20.00 %) respectively. Irrigation scheduling was the major operation influenced by the messages sent by DAMU unit of Mandya district as expressed by majority (76.67 %) of the respondents followed by harvesting operations (70.00 %), spraying operations (63.333 %) and fertilizers application (63.33 %). In Chamarajanagar district, high majority (90.00 %) of the respondents expressed harvesting operations were greatly influenced by the messages sent by DAMU units followed by spraying operations (70.00 %), irrigation schedule (43.33 %) and sowing operations (30.00 %). Overall nearly three fourth (74.17 %) of the respondents expressed harvesting operations were significantly influenced by the DAMU messages followed by spraying operations (62.50 %), scheduling of irrigation (40.00 %) and sowing operations (27.50 %).

Suggestions for effective functioning of DAMU units as expressed by the respondents

Table 13: Suggestions for effective functioning of DAMU units as expressed by the respondents

Sl. No	suggestions	Ramanagar (n=30)		Tumkur (n=30)		Mandya (n=30)		Chamaraja nagar (n=30)		Total (n=120)	
		No	%	No	%	No	%	No	%	No	%
1	Predictions should be more precise	11	36.67	9	30.00	23	76.67	5	16.67	48	40.00
2	Predictions should be given for village level / panchayath level	23	76.67	21	70.00	19	63.33	7	23.33	70	58.33
3	Modernize Meghdoot / DAMINI app	13	43.33	13	43.33	3	10.00	21	70.00	50	41.67
4	Provide predictions 4-3 times per week	7	23.33	11	36.67	4	13.33	17	56.67	39	32.50

It is clear from the results presented in table 13 that, in Ramanagar district majority (76.67 %) of the respondents expressed the suggestion for predictions should be given for village level / panchayath level followed by Modernize Meghdoot / DAMINI app (43.33 %), Predictions should be more precise (36.67 %) and Provide predictions 3-4 times per week (23.33 %). In Tumkur district Predictions should be given for village level / panchayath level was the major suggestion offered by the majority (70.00 %) of the respondents followed by Modernize Meghdoot / DAMINI app (43.33 %), Provide predictions 3-4 times per week (36.67 %) and Predictions should be more precise (30.00 %). Predictions should be more precise was the important suggestion expressed by the majority (76.67 %) of the respondents in Mandya district followed by Predictions should be given for village level / panchayath level (63.33 %) and Provide predictions 3-4 times per week (13.33 %). In Chamarajanagar district Modernization of Meghdoot / DAMINI app was the suggestion given by majority (70.00 %) of the respondents followed by Provide predictions 3-4 times per week (56.67 %) and Predictions should be given for village level / panchayath level (23.33 %). Overall Predictions should be given for village level / panchayath level was the important suggestion given by more than fifty (58.33 %) per cent of the respondents followed by Modernization of Meghdoot / DAMINI app (41.67 %), Predictions should be more precise (40.00 %) and Provide predictions 3-4 times per week (32.50 %).

Conclusion

The present study clearly demonstrates that agro-meteorological advisory services delivered through District Agro-Meteorological Units (DAMU) of Krishi Vigyan Kendras (KVKs) have significantly enhanced farm-level decision-making in Southern Karnataka. The high level of adoption and perceived usefulness reflects strong farmer confidence in weather-based advisories disseminated by KVKs. The advisories effectively supported farmers in making timely decisions regarding critical agricultural operations such as harvesting, irrigation scheduling, sowing, and plant protection measures, thereby minimizing weather-induced risks and crop losses. Farmers reported tangible economic benefits, including cost savings in irrigation and plant protection, reduction in crop damage, and improved productivity. These outcomes confirm the positive contribution of DAMU services towards enhancing farm income, resource-use efficiency, and overall farm resilience. The findings of this study are in line with earlier agrometeorological research (Rathore et al., 2014; Nannewar et al., 2020), which also reported improved decision-making ability and economic gains among farmers receiving weather-based agro-advisories. Although the DAMU project formally continued up to 2025, the Krishi Vigyan

Kendras are sustaining the initiative by regularly recording weather parameters, analyzing data, and disseminating twice-weekly agro-advisories to farmers and extension personnel of various developmental departments. However, there remains scope for further strengthening the system through: Improving forecast accuracy, enhancing village-level customization of advisories, expanding digital dissemination channels and strengthening feedback mechanisms from farmers. Hence, strengthening these aspects will further enhance the effectiveness, credibility, and impact of DAMU-based agro-advisory services in Southern Karnataka.

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