International Journal of Geography, Geology and Environment

P-ISSN: 2706-7483
E-ISSN: 2706-7491
NAAS Rating (2025): 4.5
IJGGE 2025; 7(9): 09-12
www.geojournal.net
Received: 15-06-2025
Accepted: 18-07-2025

Abhijeet Dubey
Department of Physics and Agrometeorology, College of Agricultural Engineering, JNKVV, Jabalpur, Madhya Pradesh, India

Anay Rawat PP Singh
Department of Physics and Agrometeorology, College of Agricultural Engineering, JNKVV, Jabalpur, Madhya Pradesh, India

Amit Jha
Department of Physics and Agrometeorology, College of Agricultural Engineering, JNKVV, Jabalpur, Madhya Pradesh, India

Priyanka Mishra
Department of Physics and Agrometeorology, College of Agricultural Engineering, JNKVV, Jabalpur, Madhya Pradesh, India

Corresponding Author:
Abhijeet Dubey
Department of Physics and Agrometeorology, College of Agricultural Engineering, JNKVV, Jabalpur, Madhya Pradesh, India

Economic impact of agro meteorological advisory services in Rewa district of Madhya Pradesh region

Abhijeet Dubey, Anay Rawat PP Singh, Amit Jha and Priyanka Mishra

DOI: https://www.doi.org/10.22271/27067483.2025.v7.i9a.403

Abstract
A study was conducted to study the economic benefits of farmers adopting the Agromet Advisory Services (AAS) under the "All India Co-ordinated Research Project on Agrometeorology National Innovation on Climate Resilient Agriculture" (AICRP-NICRA) project for the selected villages in Rewa district during the year 2020 in *kharif* season. The two villages Rithi and Padiya in Rewa district were selected for this study and two groups of farmers were selected, a group adopting the Agromet Advisories (20 farmers), regularly in their operation (AAS Farmers) and other group of farmers not aware of Agromet Advisories (Non AAS Farmers). In these two villages total 40 farmers was identified, AAS information issued for 20 farmers in two villages each during *kharif* season and care was taken to implement the advisories by this group. The crop situation of these farmers was compared with nearby fields having the same crops, where forecast is not adopted in Non AAS farmersfield. The data was recorded from both the farmers group particularly on crops expenditure incurred by the farmers from land preparation to harvest at every stage, has been worked out and crop growth and yields were observed regularly. The result observed that those farmers who adopted AAS information and implemented it in their field, found the better crop growth and high yield over the non-adopted AAS farmers. The net return of AAS farmers was about Rs. 56500.73 for paddy while non AAS farmers about Rs. 46354. Those farmers have adopted the Agromet Advisories on their day to day operation carried out the additional benefits.

Keywords: AAS bulletin, weather forecasting, paddy and economics

Introduction
In India, agriculture heavily relies on the monsoon, leaving farmers uncertain about future rainfall patterns, which complicates their daily decision-making in farming operations. To boost agricultural productivity and mitigate the adverse effects of unpredictable weather, it is crucial for farmers to receive timely, customized weather forecasts. This guidance enables them to take appropriate actions based on current conditions. Weather is a significant factor impacting agricultural output (Tiwari *et al*., 2013; Singh *et al*., 2013) [16, 1], and since it can fluctuate over time and across different regions, medium-range forecasts can play a vital role in reducing losses through better management of farming practices.

The Government of India established a reliable medium-range weather forecasting system under the National Centre for Medium Range Weather Forecasting (NCMRWF) in Delhi. This initiative aims to apply weather forecasts in agriculture via Agrometeorological Advisory Services (AAS). One of the primary goals of AAS is to assist farmers in leveraging prevailing weather conditions to optimize resource utilization and minimize losses from adverse weather patterns (Venkataraman, 2004) [19].

Weather forecasts and weather-based Agromet Advisories contribute to enhancing economic benefits for farmers by recommending suitable management strategies tailored to weather conditions. To evaluate the impact of agromet advisory services, assessments were conducted involving both users of AAS and non-users from various villages participating in the "National Innovation on Climate Resilient Agriculture" (NICRA) program. The results revealed that farmers who adhered to Agromet Advisories experienced reduced input costs and increased net profits compared to those who did not use these services, especially in paddy cultivation. This profit was attributed to effective crop management based on guidance from Agromet Advisory Bulletins.

Materials and Methods

To study the economic benefits of farmers adopting the Agromet Advisory Services, a field survey was conducted at Rithi and Padiya, district Rewa, about 40 farmers was selected in these villages. Under the "All India Coordinated Research Project on Agro meteorology- National Innovation on Climate Resilient Agriculture" (AICRPAM-NICRA) project during the year 2020 during *kharif* season. The two villages were selected for this study and two groups of farmers were selected, namely, a group adopting the Agromet Advisories regularly in their operation (AAS Farmers) and other groups of farmers not aware of Agromet Advisories (Non AAS Farmers). In these two villages, total 40 farmers were identified, AAS information was issued for only 40 farmers in two villages during *kharif* season and care was taken to implement the advisories by this group. The Progressive farmers have been taking interest in the agro-advisories. The major objective of this programme is to advise timely and need-based crop management practices. Weather forecast on rainfall, maximum and minimum temperature, wind speed, wind direction, cloud cover, maximum and minimum humidity are being received on every Tuesday and Friday from IMD, Pune. Once the forecast was received, the experts' opinion from different disciplines was obtained. Based on the advice, the agro advisories are being prepared on every Tuesday and Friday in Hindi language. Bulletins are regularly communicated to the farmers on real time basis through personal contact/telephone/ SMS etc. Agromet Advisory Bulletins are also sent by E-mail for publication. The weather forecast based Agromet Advisory Bulletin contains a weather forecast information for the next five days, cropmanagement, which is based on weather forecast and giving warning to the farmers well in advance, regarding rainfall variation, its amount and other weather variables including pest/disease problems. Thus, farmers can decide on crop management options, application of nutrients and strategies to overcome other problems. Weather forecast and weather based Agromet advisories help in increasing the economic benefit to the farmers by suggesting them the suitable management practices according to the weather conditions (Vashisth *et al.*, 2013 and Jagadeesha *et al.*, 2010) [1, 6]. A study was, therefore, undertaken on adaptation the Agromet advisories (AAS farmers) and those who have not adopted the advisories (Non-AAS Farmers), as any information were provided to them. The expenditure incurred to raise the crop in both the situations has been documented in each stage. Regular observations were made on the situation and constantly compared with nearby fields having the same crops where forecast is not adopted by non AAS farmers. Further, Economic impact was also assessed based on the input incurred during all cultural operation from sowing to harvest. Executed adoption of forecast was critically evaluated, including the yield differences and comparing prices in both AAS and non AAS farmers based on our Agromet Advisory Services. For assessing the impacts of Agromet Advisory Services, users of Agromet Advisory Services (AAS) and non-users of Agromet Advisory Services (non AAS) were selected for paddy crop during *kharif* season 2020.

Results and Discussion

The economic advantages experienced by farmers utilizing the Agro-Meteorological Advisory Service (AAS) during the Kharif season of 2020 have been analyzed. Table 2 presents a comparison of the total cost of cultivation, crop yield, and net returns for rice farmers using AAS versus those not using the service. The findings indicate that AAS farmers incurred lower cultivation costs compared to their non-AAS counterparts. From the data in Table 2, it's clear that AAS farmers are reaping greater benefits than non-AAS farmers. Additionally, the yield and returns are noticeably lower for non-AAS farmers. Similar findings have been reported by Singh *et al*. (2004) [15], Venkataraman (2004) [19], highlighting the importance of agro-advisories for field operations, crop projections, and pest and disease management in challenging environmental conditions. Forty farmers aware of the agro-advisory bulletins have effectively incorporated AAS into their farm management practices. Ravindrababu *et al*. (2007) [9] also confirmed that the forecasts provided significant advantages for AAS farmers compared to those who did not utilize the service. It was determined that farmers following the NICRA-AAS guidelines saved an average of Rs. 351 (approximately 11.89%) on manures and fertilizers, and about Rs. 332 (approximately 27.21%) on weeding, as shown in Table 1. The savings in fertilizers were primarily due to recommended top dressing of urea. However, costs for harvesting, threshing, winnowing, and transportation were similar across both groups.

Table 1 further reveals that AAS farmers achieved an average yield of 21 quintals per acre compared to 19 quintals for non-AAS farmers (Hansen, 2002). The study underscores the significant benefits of information obtained through the agro-advisory service, which has piqued farmers' interest in crop management. Rainfall and crop management are among the key areas where farmers seek information.

Table 1: Economic impact of AAS on Paddy crop during *Kharif* season 2020

Table 1 (A): Variable cost

S.No		Average cost with AAS	Average cost without AAS	Average saving with AAS	Percentage saving with AAS
1	Field preparation	2660	2660	0	0
2	Manure & Fertilizer	2950	3301	351	11.89
3	Sowing	974.5	974.5	0	0
4	Transplanting	4750	4800	50	1.05
5	Weeding	1220	1552	332	27.21
6	Plant Protection	0	0	0	0
7	Irrigation	0	0	0	0
8	Harvesting & Threshing	1708	1708	0	0
Subtotal (per hectare)		35655	37488.75	1833.75	5.14
	Yield	21	19	2	
	Price	39165	35435	3730	

Table 1 (B): Fixed cost

1	Land rent	8031	7087	00	00
2	Interest on working capital	200.77	177.17	00	00
	Sub total	8231.77	7264.17	00	00
	Total cost (A+B)	43886.77	44752.92		
	Total cost (A+B)	43886.77	44752.92		

(C): A+B

Table 2: Comparative analysis of cost of cultivation, production, returns, and benefit–cost ratio of paddy farmers adopting AAS versus non-AAS during Kharif season 2020.

S.No.	Particulars	Average with AAS	Average without AAS	Gross benefit with AAS
1	Cost of Cultivation (Rs/ha)	43886.77	44752.92	866.15
2	Production (Qt/ha)			
a	Main product	52.5	47.5	5
b	By-product	55	56	-1
3	Price (Rs/qt)			
a	main product	1865.00	1865.00	00
b	By-product	45.00	45.00	00
4	Return (Rs/ha)			
A	Main product	97912.5	88587.5	9325
B	By-product	2475	2520	- 45
5	Gross return (Rs/ha)	100387.5	91107.5	9280
6	Net return (Rs/ha)	56500.73	46354	10146.73
7	Net cost: Benefit ratio	2.28	2.03	0.25

Since the program's inception, a substantial number of farmers have benefitted from the AAS. The net cost-benefit ratio for AAS and non-AAS farmers stands at 2.28 and 2.03, respectively.

Conclusion

The research indicated that using the Agromet Advisory Bulletin, which incorporates both current and forecasted weather data, greatly benefits production and income levels for farmers. AAS farmers received weather-based advisories that guided them on the optimal use of inputs for various farming activities. This careful and timely application of resources led to a noticeable decrease in production costs for these farmers. Consequently, the combination of higher yields and lower cultivation expenses resulted in significantly improved net returns.

Acknowledgments

The authors thankful All India Coordinated Research Project on Agrometeorology on “National Initiative on Climate Resilient Agriculture” (AICRPAM-NICRA) ICAR New Delhi. College of Agricultural, Engineering JNKVV Jabalpur (M.P).

References

1. Vashisth A, Singh R, Das DK, Baloda R. Weather-based agromet advisories for enhancing the production and income of the farmers under changing climate scenario. Int J Agric Food Sci Technol. 2013;4(9):847-850.
2. Jha AK, Yadav PS, Shrivastva A, Dubey A, Jaiswal A. Influence of tillage and nutrient management on fodder productivity and economics of oat in rice-oat cropping system. Int J Res Agron. 2024;7(4):607-614.
3. Jha AK, Sharma RS, Vishwakarma SK. Development of resource conservation techniques for tillage and sowing management in rice-wheat system under irrigated production system of Kymore Plateau and Satpura hill zone of Madhya Pradesh. JNKVV Res J. 2007;41(1):26-31.
4. Malviya P, Jha AK, Upadhyay VB. Effect of different proportions of vermicompost and fertilizers on growth and yield of scented rice and soil properties. Ann Agric Res New Ser. 2012;33(4):228-234.
5. Raghuwanshi M, Jha AK, Naik K, Pandey A. Influence of weed management strategies on nutrient uptake and soil properties in fodder maize cultivation. Int J Res Agron. 2024;7(5):24-29.
6. Jagadeesha N, Ravindrababu BT, Pankaja HK, Rajegowda MB. Adoption of agromet advisory services for improving livelihood of rural farmers. Int J Agric Sci. 2010;6(9):584-586.
7. Pahade S, Jha AK, Verma B, Meshram RK, Toppo O, Shrivastava A. Efficacy of sulfentrazone 39.6% and pendimethalin as a pre-emergence application against weed spectrum of soybean (*Glycine max* L. Merrill). Int J Plant Soil Sci. 2023;35(12):51-58.
8. Patel R, Jha AK, Verma B, Porwal M, Toppo O, Raghuwanshi S. Performance of pinoxaden herbicide against complex weed flora in wheat (*Triticum aestivum* L.). Int J Environ Clim Change. 2023;13(7):339-345.
9. Ravindrababu BT, Janardhanagowda NA, Jagadeesha N, Rajashekhar KR, Rajegowda MB. Application of weather-based agro advisories in eastern dry zone of Karnataka. J Agrometeorol. 2007;9(2):259-264.
10. Hansen JW. Realizing the potential benefits of climate prediction to agriculture and challenges. Agric Syst. 2002;74:329-330.
11. Sairam G, Jha AK, Verma B, Porwal M, Dubey A, Meshram RK. Effect of mesotrione 40% SC on weed growth, yield and economics of maize (*Zea mays* L.). Int J Environ Clim Change. 2023;13(7):608-616.
12. Sairam G, Jha AK, Verma B, Porwal M, Sahu MP, Meshram RK. Effect of pre- and post-emergence herbicides on weed flora of maize. Int J Plant Soil Sci.

2023;35(11):68-76.
13. Sonam S, Jha AK, Shrivastava A. Evaluation of different intercropping systems for maximum productivity and economics in maize. Ann Agric Res New Ser. 2014;35(2):201-205.
14. Singh H, Jha G, Babu S, Jha AK. Effect of seed rate and sowing depth on growth, yield attributes and yield of irrigated wheat (*Triticum aestivum*) in Madhya Pradesh. Indian J Agron. 2013;58(2):57-59.
15. Singh S, Rao VUM, Singh D. Scientific support in farm decision-making through weather-based advisory services in Haryana. J Agrometeorol. 2004;6(Spec):265-267.
16. Tiwari RK, Jha A, Tripathi SK, Khan IM, Rao SK. Rice-based cropping system and climate change. JNKVV Res J. 2013;47(1):239-247.
17. Tomar DS, Jha AK, Porwal M, Verma B, Tirkey S, Khare Y, *et al*. Efficacy of halauxifen-methyl + florasulam against complex weeds in wheat under Kymore Plateau and Satpura hill zone of Madhya Pradesh, India. Int J Plant Soil Sci. 2023;35(15):161-171.
18. Tomar DS, Jha AK, Verma B, Meshram RK, Porwal M, Chouhan M, *et al*. Comparative efficacy of different herbicidal combinations on weed growth and yield attributes of wheat. Int J Environ Clim Change. 2023;13(8):889-898.
19. Venkataraman S. Climatic characterisation of crop productivity and input needs for agrometeorological advisory services. J Agrometeorol. 2004;6(1):98-105.
20. Yadav PS, Jha AK, Kewat ML, Sahu MP, Verma B. Effect of sowing management and herbicides application on weeds and yield of berseem (*Trifolium alexandrinum*). Indian J Agron. 2024;69(1):71-77.
21. Yadav PS, Kewat ML, Jha AK, Kondagari H, Verma B. Effect of sowing management and herbicides on the weed dynamics of berseem (*Trifolium alexandrinum*). Pharma Innov J. 2023;12(2):2845-2848.
22. Yadav PS, Jha AK, Pachauri V, Verma B, Shrivastava A. Oat genotypes response to different nitrogen levels under agro-climatic condition of Kymore Plateau zone of Madhya Pradesh. Pharma Innov J. 2023;12(4):2371-2374.