

NATIONAL CONCLAVE

SUSTAINABLE FOOD SYSTEMS

October 27-29, 2025

Anil Agarwal Environment Training Institute, Nimli, Rajasthan



Importance of District Agro-Meteorology Unit in Indian agro-weather advisory services

Presented by:

Dr. Manjeet

Agril. Meteorology-Subject Matter Specialist
ICAR-IARI, Krishi Vigyan Kendra, Gurugram (Haryana)

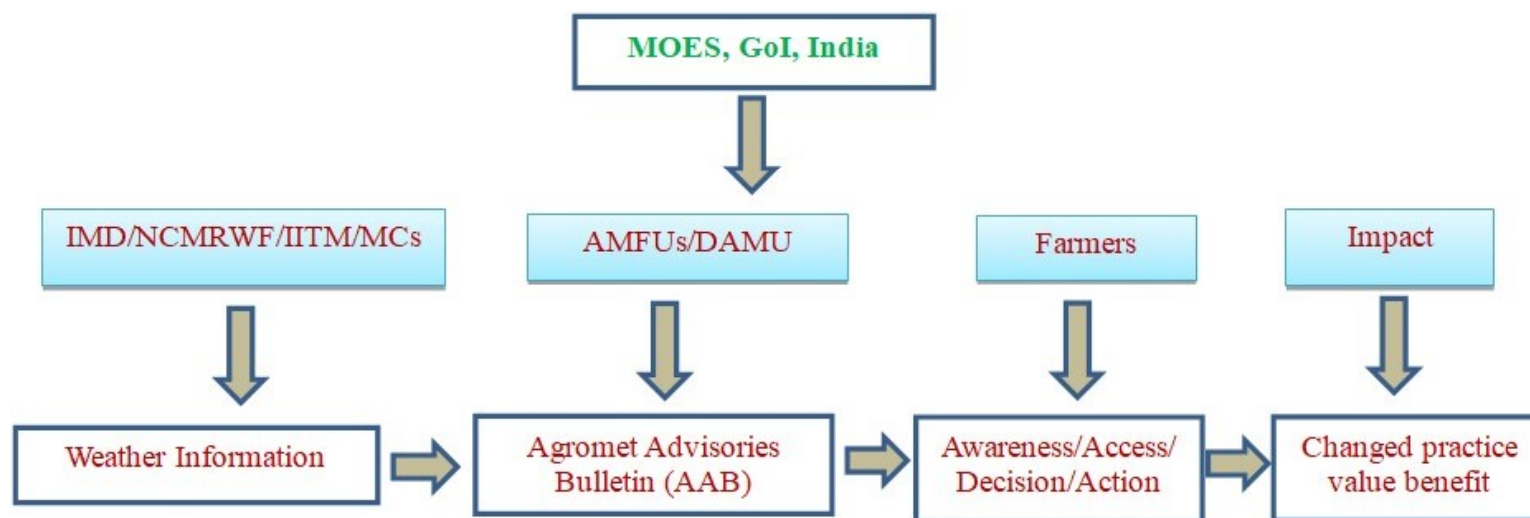


INTRODUCTION

- Agriculture in India depends on weather and climatic conditions. Weather through various atmospheric factors plays a significant role in reaping good agricultural output.
- Weather forecasts are essential for taking decisions regarding crop choice, crop variety, sowing harvesting dates and judicious management of agricultural operations such as field preparations, ploughing, irrigation, scheduling and application of fertilizers, pesticide, herbicide and harvesting.
- AAS set up exhibits a multi-institutional and multidisciplinary synergy to render an operational service for use of the farming community. The Medium Range Weather Forecast (MRWF) based agro advisories are not only useful for efficient crop production management of farm inputs but also leads to precise impact assessment.
- It is possible to assess the economic benefit of the agro-meteorological services . This can be achieved if the scientific methods to be used for weather-based advisories have a direct relationship with the traditional knowledge of the farmers. From a farmer's perspective, the forecast value increases if the weather and climate forecasts are capable of influencing their decisions on key farm management operations.
- The primary objective of the agro advisory services is to guide the farmers regarding the actual and forecasted weather and its effects on the day-to-day farm operations.



A five day medium range weather forecast received every day from Meteorological Centre, Chandigarh and IMD (Agrimet), Pune on every Tuesday and Friday of the week.



Role and Responsibility of SMS and AO

- Preparation of block level, AAS bulletins, Advisory prepared crops, Horticulture and livestock.
- Visit IMD site (Satellite, RADAR, weather forecast, Nowcast, Meteogram), Agro-Decision Support System Portal and Agrimet Site.
- Analysis of 30 year data for climate normal and understand the climatic change and variability time to time, Work on AWS Data.
- Attending training, seminar, lecture. Attend meeting of IMD and MC. □ Regular monitoring of all sensors of Automatic Weather Station.
- Compression of soil moisture in crop plot and bare plot.
- Collect pest, disease and crop phenology data by visual observation at farmer field or by personal interview of Google form.
- Develop Crop weather pest model by using past and prevailing weather condition for forecasts the time disease pest commencement in advance.
- Develop Crop calendar of major crop at block level to understand the previous and prevailing and future condition impact on crop and also change in crop pattern due to climate variability.
- Reporting of DAMU work to IMD (APR, PPT, FAP reports, Quarterly reports for GKMS newsletter).
- Dissemination of Pusa Samachar.
- Compression of forecast data and AWS data.
- Prepared report regarding real time dynamic feedback (weekly)



- Upload block level and district level AAS bulletins on agromet website (Tuesday and Friday)
- Maintain AWS date in excel sheet (Daily)
- Visit AWS site and Maintenance of AWS site (Daily)
- Maintain forecast date in excel sheet (Tuesday and Friday)
- Collection of data from farmers for real time dynamic feedback (Saturday).
- Enter data in excel sheet and fill google form of real time dynamic feedback (Monday).
- Help in preparation of real time dynamic feedback report (Monday).
- Weekly collection of soil sample for moisture from crop and bare plot (Thursday).
- Collection of soil sample at AWS site in 15 days interval.
- Enter soil sample date in excel sheet as well as in register.
- Increased Whatsapp group number and update in Agro-DSS portal.
- Upload farmers awareness programme reports as well as photo on agrimet website.
- Write short message in Hindi and disseminate to farmers through Whatsapp group and m-kishan portal.
- Write weather content in Hindi for news paper.
- Help in making, editing in farmer's feedback videos
- Prepared google form for farmer's feedback collection (for Rabi season).
- CSC Portal (Daily), Help in 30 year Data, Reply regarding any query of farmers in Whatsapp group.
- Update in excel sheet lists of farmers, help in advisory preparation (Tuesday and Friday).
- Help in MPR preparation.



Economic impact analysis of wheat (Rs. /acre) in Gurugram, Faridabad, Mewat and Palwal during *Rabi* season of 2022-23.

	Gurugram			Faridabad			Mewat			Palwal		
Type	No AAS	AAS	Benefit	No AAS	AAS	Benefit	No AAS	AAS	Benefit	No AAS	AAS	Benefit
Land preparation	3000	2400	600	2400	1800	600	2400	1800	600	2400	1800	600
Sowing+ Seeds + Fertilizer	6080	3040	3040	6080	3040	3040	6080	3040	3040	3980	3040	940
Fertilizers (a) Urea	804	536	268	670	536	134	670	536	134	670	536	134
Weeding and other cultivation operations	2000	1000	1000	1800	1350	450	1350	900	450	1350	900	450
Irrigation water charges	9600	8000	1600	10000	8000	2000	6000	4500	1500	6400	4500	1900
Plant protection measures	1390.5	1007	383.5	1007	623.5	383.5	1007	623.5	383.5	1007	623.5	383.5
Harvesting + Thrashing+ Transportaton	10600	9200	1400	10600	9200	1400	11000	9200	1800	10500	9000	1500
Total Cost	33474.5	25183	8291.5	32557	24549.5	8007.5	28507	20599.5	7907.5	26307	20399.5	5907.5
Grain Yield	66865.5	74295	7429.5	59436	64389	4953	49530	56959.5	7429.5	52006.5	59436	7429.5
Straw Yield	10000	12000	2000	12000	12500	500	9000	10500	1500	9000	10500	1500
Gross Income	76865.5	86295	9429.5	71436	76889	5453	58530	67459.5	8929.5	61006.5	69936	8929.5
Net Balance	43391	61112	17721	38879	52339.5	13460.5	30023	46860	16837	34699.5	49536.5	14527
B:C	0.29			0.26			0.36			0.30		

Manjeet *et al.*, (2025), *Plant Archives*

NATIONAL CONCLAVE ON SUSTAINABLE FOOD SYSTEMS



Economic impact analysis of Cotton (Rs. /acre) in Gurugram, Faridabad, Mewat and Palwal during *Kharif* season of 2022.

	Gurugram			Faridabad			Mewat			Palwal		
Type	No AAS	AAS	Benefit	No AAS	AAS	Benefit	No AAS	AAS	Benefit	No AAS	AAS	Benefit
Land preparation	2400	1800	600	2400	1800	600	2100	1600	500	2400	1800	600
Sowing+ Seeds + Fertilizer	4300	2150	2150	4300	2150	2150	4300	2150	2150	4300	2150	2150
Fertilizers (a) Urea	1890	1620	270	1890	1620	270	1840	1550	290	1890	1620	270
Weeding and plant protection	10800	8400	2400	10600	7900	2700	10000	7600	2400	10400	7800	2600
Irrigation water charges	6400	4800	1600	6400	4800	1600	6000	4500	1500	6400	4800	1600
Harvesting + Thrashing+ Transportaton	14200	13600	600	13700	11600	2100	11800	11300	500	13700	11600	2100
Total Cost	39990	32370	7620	39290	29870	9420	36040	28700	7340	39090	29770	9320
Grain Yield	60800	72960	12160	60800	68096	7296	58368	66880	8512	57152	67488	10336
Straw Yield	4000	5000	1000	4500	4900	400	3500	5000	1500	4100	4600	500
Gross Income	64800	77960	13160	65300	72996	7696	61868	71880	10012	61252	72088	10836
Net Balance	24810	45590	20780	26010	43126	17116	25828	43180	17352	22162	42318	20156
B:C	0.49			0.43			0.44			0.52		



Comparative analysis of cost of cultivation in wheat during Rabi 2020-21 at Jalandhar

Inspects for the crop	15 th November, 2020-21				5 th December, 2020-21			
	AAS farmers		Non-AAS farmers		AAS farmers		Non-AAS farmers	
	Quantity	Cost/acre	Quantity	Cost/acre	Quantity	Cost/acre	Quantity	Cost/acre
Seed	40	1200	40	1200	40	1200	40	1200
Seed treatment	150	50	300	100	150	50	300	100
Fertilizer								
Urea	110	595	110	595	110	595	110	595
DAP	55	1238	55	1238	55	1238	70	1575
Potash			20	392			20	392
Pesticide/Herbicides								
Stomp 30 EC (ml)	1000	500	2000	1000	1000	500	2000	1000
Tilt 25 EC (ml)	200	210	400	420	200	210	400	420
Actara 25 WG (g)	-	-	40	200	-	-	40	200
Gypsum	-	-	100	600	-	-	100	600
Human labour	14	4928	17	5984	14	4928	17	5984
Machine labour	7	2500	7	2500	7	2500	7	2500
Irrigation	3	180	5	300	3	180	5	300
Harvesting	-	3100	-	3100	-	3100	-	3100
Total cost (Sum of all above)	-	14501	-	16437	-	14501	-	16774
Gross return	21.1	37980	19.9	35820	19.2	34560	18.1	30780
Net Return (Total VOP-Total cost)	-	23479	-	19383	-	20059	-	14006
B:C	-	1:2.6	-	1:2.2	-	1:2.4	-	1:1.8

Kaur et al., (2024), Mausam



Effect of weather parameters on cotton crop in NTR district, Andhra Pradesh

Growth stage	DAS	Weather parameter	Effect of weather parameter
Emergence	4 -10	Rainfall and Humidity	Wilt Rootrot disease.
Vegetative	20-45	Sunny weather, Hightemperature	Whitefly jassids attack
Square formation	50-70	Rainfall, and highhumidity.	Square dropping
Flowering	75-90	Humidity, Temperatureabove20°C	Bacterial leaf spot
Boll formation	90-110	Rainfall, Highhumidity,	Fruit rot disease
Boll maturity	110-125	Rainfall, andHighhumidity	Root rot, fruit rot.

Input cost comparison in cotton crop between the AAS and non AAS farmer

S. No	Inputs	Cost of Inputs by AAS farmer	Cost of Input by Non AAS farmer
1	Seed	1200	1500
2	Fertilizers	4000	6000
3	Pesticides	8000	12000
4	Labour	4000	6000
5	Farm Machinery	3000	5000
6	Pickings	4500	6500
Total		24,700	37,000

Narasimha *et al.*, (2023), *International Journal of Environment and Climate Change*



Profitability of weather based Agro Advisory services during the crop growing situation in NTR District, Andhra Pradesh

Advisory date and weather event	Given and used advisory	Profitability
Prediction of rainfall forecasting on June 09, 2022.	Farmers are advised for timely sowing.	Advantage of timely sown cotton.
Prediction of rainfall forecasting on June 29,2022.	Farmers are advised to do weeding operation.	Advantage of in time weeding operation.
Forecasting of Rainfall june 15,and 18, 2022	Farmers are advised to stop fertilizers application.	Saving of cost of fertilizers.
Prediction of forecasting of Rainfall Aug.25, 2022	Farmers are advised to stop pesticides spraying.	Saved money from pesticides and its spraying spraying.
Prediction of forecasting of Rainfall sep 07, 2022.	Farmers are advised to complete harvesting	Saved labor cost and cotton quality by completely picking.

Narasimha *et al.*, (2023), *International Journal of Environment and Climate Change*



Economic impact of AAS on Paddy crop at Rewa district of Madhya Pradesh during *Kharif* season
2020

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	

Dubey *et al.*, 2025, *International Journal of Geography, Geology and Environment*



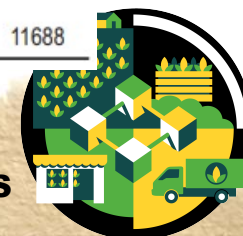
Economic benefits (Rs. /ha.) of Rice cultivation as influences by AAS at West Bengal during *Kharif* season 2017 and 2018

	Land Preparation		Fertilizers		Seed		Irrigation		Pp Chemicals		Harvesting		Yield (ton)		Total cost		Income		Profit	
Year	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
AAS user	5250	5425	4175	4336	1200	1312.5	1470	1750	2150	2250	7500	8300	4	4.2	21745	23373.5	52000	54500	30255	31226.5
Non-AAS User	5250	5250	4350	4525	1200	1500	2185	2680	3200	3562	7500	8300	3.4	3.6	23685	25817.5	47000	48200	23315	22382.5
							715	930	1050	1312									6940	8844

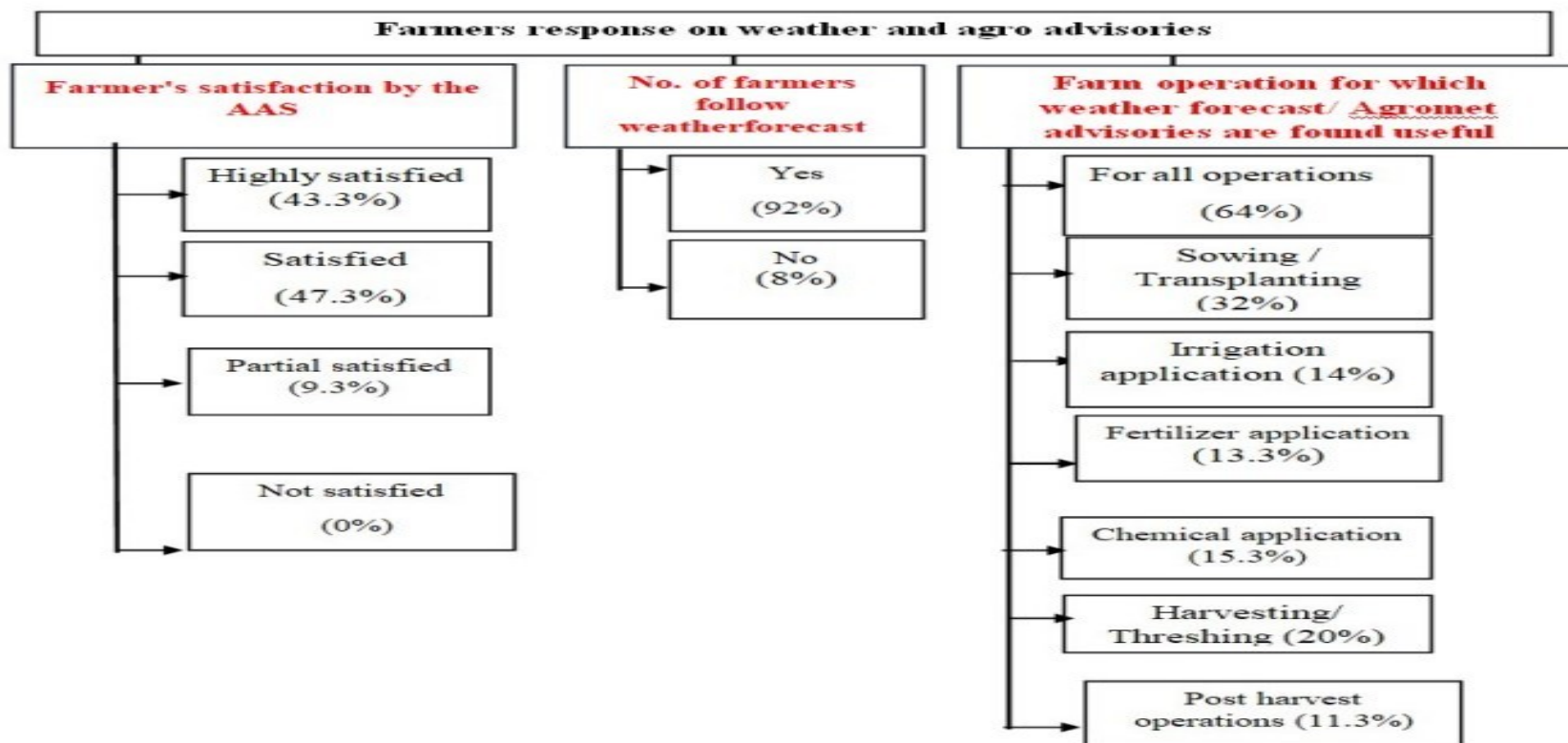
Economic benefits of Brinjal cultivation as influences by AAS at West Bengal during *Rabi* 2017-18 and 2018-19

	Land Preparation		Fertilizers		Seed		Irrigation		Pp Chemicals		Harvesting		Yield (ton)		Total cost		Income		Profit	
Year	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19
AAS users	21500	2250	15840	18437	275	350	3200	6000	2500	4875	21500	22500	10	10	64815	54412	100000	100000	35185	45588
Non-AAS users	22000	2250	18800	22500	275	350	4425	7125	4500	6375	21500	22500	9.2	9.5	71500	61100	92000	95000	20500	33900
Benefit							1225	1125	2000	1500									14685	11688

Saha *et al.*, (2024), *Journal of Environmental Biology*



Farmers response on weather and agro advisories at Palghar district of Gujarat



Sayyad, R.S. and Jadhav, (2023), *International Journal of Current Research*



Economics of Green gram (Rs./ha.) as influenced by AAS at Odisha during Summer season (2014-15 and 2015-16)

Particulars	AAS Farmers	Non AAS Farmers
Seed	750	750
FYM	1800	1800
Seed treatment	500	-
Fertilizers and micronutrients	2170	3000
Pesticides	1000	1500
Weedicide	450	450
Human labour	6655	6055
Machine labour	2000	2000
Bullock labour	450	450
Irrigation	1000	500
Spraying of 2% Urea solution at pre& post flowering	400	-
Grain yield (q/ha)	12.0 (25)	9.0

(Figure in parenthesis indicates percent increase over control)

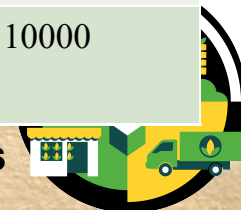
Type	Cost of cultivation	Gross return	Net return	B:C ratio
AAS Farmers	17175	39600	22425	2.31
Non AAS Farmers	16505	29700	13195	1.80

Ray *et al*, (2017), Vayu Mandal



Economic impact of Agromet advisory services (Success Story)

Sr. No.	Name	Mob.	District	Block	Crop (Rabi)	Crop (Kharif)	Land (Acre)	Profit (Rabi=Khar if)
1.	Anil	9318415353	Gurugram	Pataudhi	Wheat & Mustard	Bajra	7	60000
2.	Amit Kumar	7056873491	Gurugram	Farukhnagar	Wheat	Bajra	4	17000
3.	Pradeep	9467393837	Gurugram	Pataudhi	Wheat	Cauliflower	13	98000
4.	Bijender	9992802226	Gurugram	Farukhnagar	Wheat	Bajra (10)	14	51500
5.	Amit Kumar	7042174674	Gurugram	Sohna	Wheat	Bajra	3	21000
6.	Vinod	7027270764	Gurugram	Farukhnagar	Wheat, Mustard	Bajra	10	26000
7.	Rajbir	9416546354	Gurugram	Farukhnagar	Wheat, Pea	Bajra	3	10000



Some glimpse of Farmer Awareness Programme



Conclusion

- The adopt AAS farm gives higher yield and net returns than non-adopted AAS due to the judicious and efficient use of inputs and following the AAS in the farming operations.
- Higher percentage of adopted AAS farmers are satisfied the service of Agromet advisories.
- Agro-weather advisory services farmers can get more benefits for the planning of farm operations and got higher yields and net returns as compared to Non-AAS farmers.
- Agro-advisory service is emphasis on optimum use of input for different farm operation.
- Applications of AAS in farm operation minimize the losses from aberrant weather. The increased yield level and reduced cost of cultivation led to increased net returns and ultimately it is beneficial for farming community.



