District Agro Meteorological advisory services in Agriculture, Horticulture and its allied sectors in NTR District of semi arid region of South coastal Andhra Pradesh, India

ABSTRACT

Agriculture is the main economy for rural population over 70 per cent of Indian population depends on agriculture directly or indirectly. Agriculture plays important role in rural economy. Weather plays crucial role in agriculture. Timely weather forecasting plays main role in agriculture by keeping the view India Meteorological Department and Indian Council for Agricultural Research, were initiated 1 centers at KVK. In Andhra Pradesh 7 District agro-meteorological units (DAMUs) centers (Amadalavalasa, Rastakuntabai, Garikapadu, Darsi, Nellore, Utukuru and Banavasi) were established as well as in India 340 DAMUs were established to send agro advisory services at district level. In N.T.R and Krishna district DAMU initiated during the year 2019 located at Dr. K.L. Rao Krishi Vigyan Kendra, Garikapadu. The DAMU units send biweekly bulletins in the N.T.R and Krishna district every Tuesday and Friday. During the year 2022-23 in *Kharif* season provides more number of agro and its allied sectors advisories. In cotton Boll Rot management and Pink Boll Worm management messages more number of messages sent. Horticulture crops such as Chilliprovided more no. of messages on black thrips management. In livestock buffalo foot and mouth disease control vaccine messages has been sanded as well as in poultry to control of rannikhet disease sent more. Weather related messages has been communicated through what's app groups and telegrams.

Keywords:-Agriculture; Horticulture; Livestock; Bi weekly; District agro meteorology units, Indian meteorological department

Introduction

District Agro Meteorological Unit (DAMU) **under**GraminKrishiMausamSewa (GKMS) is the flagship programme of Govt. of India for weather related services to the farmers aiding in decision making on day-to-day agricultural operations. This scheme is extended to block level to address weather needs of farmers at micro-level.This is a joint effort of India Meteorological Department (IMD) and Indian Council of Agricultural Research (ICAR) with multi-organisational collaboration to implement various components and issuing crop and location specific weather based agro advisories for the benefit of farming community on every Tuesday and Friday and occurrence of extreme weather.

Agro meteorology is an important multidisciplinary subject. Hence, ICAR maintains Agromet observatories as well as Automated Weather station (AWS) at its KrishiVigyanKendras (KVKs) to generate agro meteorological information for use in studies on crops, pests and diseases, soil, agro forestry, livestock, horticulture, agriculture physics, soil science, etc. Such data will help ICAR institutes to study crop-weather relationship, relationship between crop weather and pest/ disease and develop region/ location specific agro met predictive models.

District Agro Meteorological Unit (DAMU) established in ICAR – Dr. K.L. Rao KrishiVigyan Kendra, Garikapadu (N.T.R Dist.) during 2019 with primary objective of preparing weather based advisories for management practices in agriculture after due consultation with subject matter specialists of concerned disciplines and disseminate the same to the end users up to village level using all possible modes of communication.

Review of literature

Praveen *et al.* concluded that 45.33 percent of AAS registered Arecanut growers farm income was raised in between 25,000 to 50,000 per annum after the intervention of AAS. Finally, 71.3 percent of farmers were satisfied by AAS service rendered by AMFU of ZAHRS, Brahamavar.

Ramachandrappa *et al.* (2018) (five years study indicated that the farmers who adopted agro advisory services on real time basis realized 22 to 379% higher economic benefits.

Sharma *et al.* (2022) concluded that the farmers, who followed the agromet advisories, are able to reduce the input cost with increase in the net profit as compared to the non AAS farmers regarding wheat crop this can profit might be due to the crop management practices adopted by the AAS farmers according to agromet advisory services.

Viswanath et al (2023) concluded that majority of farmers were in need. Temperature forecast came in second (68.8%), followed by rainfall forecast (90.8%). Accurate weather predicting would allow the farmers to plan their farm activities like Fertiliser application, Bordo spraying, Harvesting, etc., timely weather prediction aids AAS registered farmers to plan

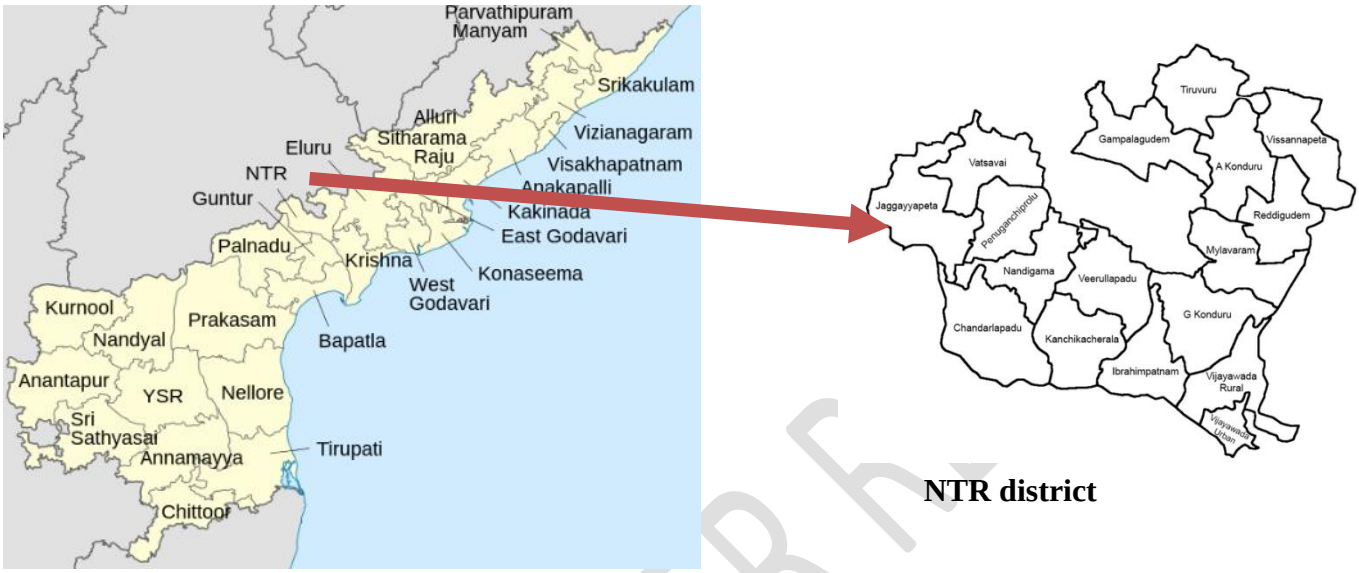
agricultural operations to avoid crop losses hence maintaining sustain and stable farm income. The AAS service provided by DAMU, Prakasam, satisfied 85 percent of farmers.

Manjusha *et al.* (2019) Concluded that farmers who adopted the Agro met Advisories services in their day to day agricultural activities have earned extra benefits like 80.91 %, 77.27%, 79.09%, 79.09% and 66.36% in crop growth, plant protection, irrigation, income and adverse weather issues related to animal husbandry, respectively.

Shanmukha *et al.* (2022) concluded that effectiveness of social media was analyzed by developing a composite index with four sub-indicators having a Cronbach alpha of 0.8 which stated that the majority of the farmers 39.7 per cent had medium eff ectiveness of the messages they received.

Materials and Methods

The present study was carried out in NTR district of Andhra Pradesh, NTR district comprises 20mandalsin seven sub divisions (Jaggyyapeta, Nandigama, Mylavaram, Thiruvuru, Vijayawada east, Vijayawada west and Vijayawada central are the Major subdivisionsin NTR district. The district major agriculture cropping system were rice, cotton, maize, red gram, green gram, black gram Such as horticulture crops Mango, chilli, turmeric, tomato and okra. Livestock and poultry etc. The district west side consists of KVK at Garikapadu consists of District agro meteorological unit the scheme may provide location, need and weather based crop data through what's app groups, Kisansarthi portal, Meghdoot app and biweekly bulletins to provide information on various diseases and pest management in crops, livestock's and poultry sectors.The DAMU project of KVK, Garikapadu send yearly 96 agro advisory bulletins to district wise and sub division wise sent to farmers, Agricultural department and allied department officials(Village agricultural and horticultural assistants, Animal husbandry assistants). The station also consists of automatic weather station (funded and supported by Indian meteorological department) datathat collects daily data on various weather parameters like rainfall, temperature maximum and minimum, relative humidity and sunshine hours. Based on the daily recorded data from automatic weather station collected and prepared advisory bulletin and uploaded national IMD website.



NTR district

Figure;-1Andhra Pradesh

Results and Discussion

Table:-1 Number of Advisories agriculture crops affected diseases and pests sent during Kharif and Rabi season in NTR district of Andhra Pradesh

S.No	Crop (Agriculture)	Pest	No of advisories		Diseases Kharif	No of advisories	
			Kharif	Rabi		Kharif	Rabi
1.	Paddy	Stem borer	12	18	Leaf Blast	12	24
		Leaf folder	8	16			
2.	Maize	Fall army worm	09	24	Stem blight	07	29
3.	Cotton	Pink boll worm	4	34	Boll rot	20	12
4.	Green gram	Maruca	15	17	Cercospora leaf spot	17	40
5.	Redgram	Maruca	4	19	Wilt	12	18
6.	Bengal gram	Pod borer	0	24	Wilt	0	19

From the table 1 it concluded that in paddy stem borer major incidence occurred at rabi season compared with Kharif, similarly leaf folder damage observed more in rabi season compared with kharif season. In maize fall army worm damage occurred more at rabi compared with kharif season so the advisories sent to farmers more. The pink bollwarm damage occur more at October to December months and greengramand red gramin NTR district at the time of flowering to pod initiation and filling stages maruca damage Bengal gram is a rabi crop the pod borer occurs at pod initiation to pod formation stage. Similarly Leaf Blast major incidence is occurred at rabi season compared with kharif.Similarly Stem blight major incidence is occurred at kharif season compared with rabi. In cotton Similarly Bollrot major incidence is occurred at kharif season compared with rabi.In Greengram Similarly Cercospora leaf spot incidence is occurred at kharif season compared with rabi.In Redgram Similarly wilt incidence is occurred at rabi season compared with kharif.In Bengalgram Similarly wilt incidence is occurred at rabi season compared with kharif.

Table:-2 Number of Advisories sent on horticulture crops affected diseases and pests duringKharif and Rabi season in NTR district of Andhra Pradesh

S. No	Crop (Horticulture)	Pest	No of advisories		Diseases	No of advisories	
			Kharif	Rabi		Kharif	Rabi
1.	Chilli	Black thrips	0	56	Fruit rot	09	32
2.	Mango	Thrips	0	45	Powdery mildew	12	34
3.	Turmeric	Shoot borer	26	12	Rhizome Rot	09	22
4.	Okra	White fly	17	25	Yellow mosaic virus	12	19
5.	Tomato	Fruit borers	30	19	Damping off	22	16

From the table 2 it concluded that in Inchilli Similarly Black thrips incidence is occurred at rabi season compared with kharif.In Mango Thrips incidence is occurred at rabi season compared with kharif.In Okra Similarly whitefly incidence is occurred at rabi season compared with kharif. In Tomato Similarly fruit borers incidence is occurred at kharif season compared with rabi. In chilliSimilarlyfruitrot incidence is occurred at rabi season compared with kharif. In mangoSimilarlypowderymildew incidence is occurred at rabi season compared with kharif. In TurmericSimilarly incidence is occurred at rabi season compared with kharif. In OkraSimilarly yellow mosaic virus incidence is occurred at kharif season compared with rabi.In Tomato Similarly Damping off incidence is occurred at kharif season compared with rabi.

Table:-3 Number of Advisories sentto livestock diseases

S.No	Name of the livestock	**Diseases**	**No of advisories**	
			Kharif	**Rabi**
1.	Buffalo	Foot and mouth disease	22	44
2.	Cow	Lumpy skin disease	09	46
3.	Sheep	Foot and mouth disease	14	29

From the table 3 it concluded that in Livestock in Buffalo Similarly Foot and mouth disease incidence is occurred at kharif season compared with rabi.in cow Similarly Lumpy skin disease incidence is occurred at rabi season compared with kharif.in Sheep Similarly Foot and mouth disease incidence is occurred at kharif season compared with rabi.

Table:-4 Number of Advisories sent in poultry diseases

S. No	**Poultry**	**Diseases**	**No of advisories**	
			Kharif	**Rabi**
1.	Hen	Fowl pox	19	26
		Rannikhet	09	34

From the table 4 it concluded that in Poultry in Hens Similarly Fowl pox disease incidence is occurred at summer season compared with kharif&rabi.in Hens Similarly Rannikhet disease incidence is occurred at kharif season compared with rabi.

Table:-5 Number of Advisories sent in Generalagriculture and allied related sectors

S. No	**Activity**	**No of advisories**		
		Kharif	**Rabi**	**Summer**
1.	Land preparation	08	05	16
2.	Bio fertilizers	22	12	05
3.	Mushroom Cultivation	15	7	0
4.	Apiary	12	15	0
5.	Soil testing	08	0	16

From the table 5 it concluded that in Land preparation is Similarly observed at summer season compared with kharif&rabi.Bio fertilizers application is Similarly observed at summer season compared with kharif&rabi.Mushroom cultivation is Similarly observed atkharif&rabi season compared with summer season. Apiary cultivation is Similarly observed at Kharif&rabi season compared with summer. Soil testing is Similarly observed at summer season compared with kharif&rabi.

Table:-6 Number of agro advisory messages sent through various media

S. No	Media	Number of farmers registered/ Covered	Number of messages sent during the year
1.	What's app	5046	2,060
2.	Kisansarathi	3082	778
3.	Awareness programmes	70 programmes	70
4.	Meghdot	12,074	96

During the year 2022-23 the messages sent through what's app 2, 060 followed by kisansarathi 778 messages, various weather based agro advisory given through awareness programmes seventy awareness programmes given along with RBKs, state agricultural departments and DRC meetings.

Meghdoot app registered 12,074 farmers from the application 96 messages sent through the meghadoot application.

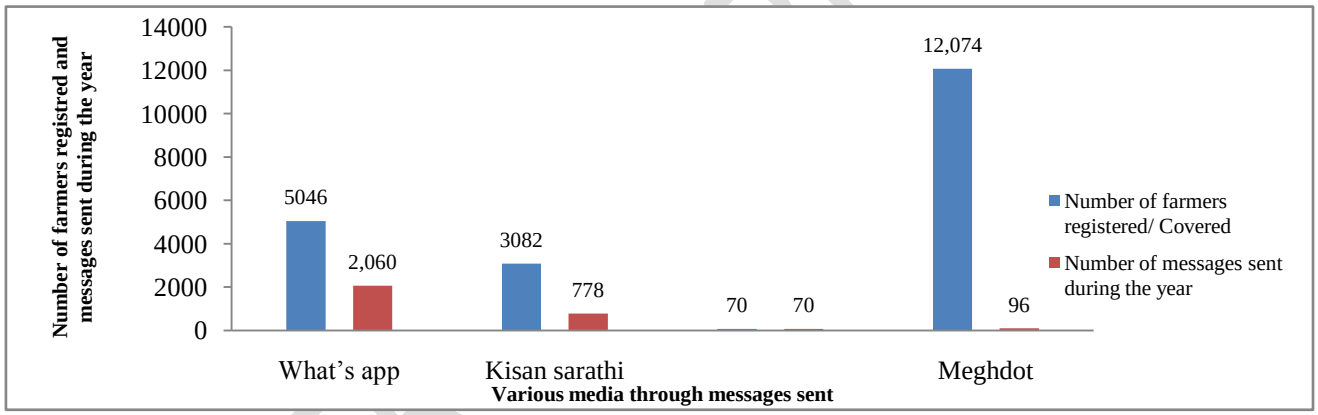


Figure:-2 Number of agro advisory messages sent through various media

Conclusion

The study has shown the effectiveness of Agro advisory services to the farming Community. The more number of messages sent through whats app groups effectiveness of messages through

social media by sending the messages on the relevant topic based on location-specific, time-specific, crop-specific content media, farmers can develop their content and post their problems to the agriculture extension agents, scientists, or subject matter specialists through images and videos. The comprehensibility of the information started that farmers can interpret the information shared in social media from an easily understandable to an understandable range. It indicates information. As social media is user-generated content media, farmers can develop their content followed by kisan sarathi, awarness programmes and meghdoot application. The advisiory bulletins bi weekly sent to district level and sub divisions level to educate the farmers on weather related advisiories. Summing up the results, it can be concluded that whatsapp groups,kisansarathi, helps in the farm development of farmers as most of their information needs are catered around crop health management followed by technological advancement.

References

Hansen, J.W. (2002). Realizing the potential benefits of climate perdition to agriculture and challenges. Agric. Systems, 74 : 329- 330.

Manjusha, K.P. Nitin, D. Suvarna and. Vinaykumar, H.M. 2019.Exposure, Perception and Advantages about Weather based Agro-advisory Services by Selected Farmers of Anand District, India. International Journal of Current Microbiology and Applied Sciences. 8(05):1934-1944

Narasimha, M.R., Subbiah, P.V., Reddy, I.V., Prasad, ., P. N. S and Shekar N. R.2023. Impact of Agrometerology Advisory Services (AAS) for Assessment of Cotton Cropping System in NTR District of Andhra Pradesh, India.*International Journal of Environment and Climate Change*. 13(7):495-502.

Prakash, S.S Mishra,S.R., Kumar,V, Saran.B and Jaiswal, P. 2020. Economic impact and usefulness of agromet advisory services for wheat crop of Siddhartha Nagar district of Uttar Pradesh. *The Pharma Innovation Journal*.9(12): 71-74.

Praveen, K.M., Sudheer K. K.V., Lakshmana, Ranjeetha, K and Swathi, S.Y. 2022 .Analyzing the impact of weather based agro-advisory services of GKMS project among arecanut growers of Udupi district of Karnataka. *The Pharma Innovation Journal*. 11(1): 07-11

Ramachandrappa, B.K., Thimmegowda, M.N., Krishnamurthy, R. Srikanth B.P.N., Savitha, M.S. Srinivasarao, Ch., Gopinath, K.A. and Ravindra C. G. 2018. Usefulness and Impact of Agromet Advisory Services in Eastern Dry Zone of Karnataka. *Indian J. Dryland Agric. Res. & Dev*. 33(1) : 32-36

Ratnam.M and Vindya. S. 2020.Analysis of rainfall data at AMFU

unit - LAM, Guntur district of Andhra Pradesh.*J. Res. ANGRAU*. 48: (1) 65-68.

Ravindrababu, B.T., Janardhanagowda, N.A., Jagadeesha, N., K.R., Rajashekhar, Rajegowda, M.B. (2007). Application of weather based agro advisories in eastern dry zone of Karnataka. J. Agrometeorology., 9 (2): 259-264.

Shanmuka, A., Lenin, V., Sangeetha, V., Muralikrishnan, L., Ramasubramanian, V. and Alka Arora (2022). Effectiveness of social media based agro-advisory services in Andhra Pradesh – An analysis. *Indian Research Journal of Extension Education*.22(4), 77- 81.

Sharma, S.K., Sharma, T.R., Shukla, M., Singh, S and Pandey, A.K. 2022.Perceived impact of agro meteorological advisory services in Rewa district of Madhya Pradesh. The Pharma Innovation Journal .11(6): 561-564.

Singh Surendra, Rao, VUM, Singh Diwan. Scientific support in farm decision making through weather based advisory services in Haryana. J. Agrometeorology. 2004;6(sp.):265-267.

Srishailam, B.V. Sailaja, P. Ganesh Kumar, D. Subramanyam and Shaik Nafeez Umar.2023. Index to Assess the Impact of Weather based Agro-Advisory Services among the Cotton Growers of Telangana and Andhra Pradesh States. Biological Forum – An International Journal 15(4): 740-746.

Venkataraman. 2004.Climatic characterisation of crop productivity and input needs for agro meteorological advisory services. J Agro meteorology.;6(11):98- 105.

Viswanath, K. R, Prasad, D.N.V.V.S., Usha, M., Jahnavi, M, Krishna, L.N., Reddy, V.T., Manasa, T and Siva, M. 2023. Impact of agromet advisory services of district agrometunit (DAMU) in Prakasam district of south costal Andhra Pradesh. *The Pharma Innovation Journal*. 12(6): 1130-1133.