Original Research Article

Farmers feedback on the block level agro-met advisory through agro met unit (DAMU) in Sirohi district of Rajasthan

Abstract

The study was conducted during 2021–22 in jurisdiction of Sirohi district, Rajasthan, India to analysis the importance of agromet advisories and how much it beneficial to farmers.

Indian meteorological department (IMD)and Indian Council of Agricultural Research under a centrally sponsored scheme of Ministry of Earth Science, Govt. of India established District Agro-Met Units (DAMUs) in Krishi Vigyan Kendra in 2019.DAMU will frame the block level agromet advisory services using multichannel communication mechanism in the country to reach out to 95.4 million farming households. On the basis of the weather forecasting,advisory messages prepared by Scientists of Krishi Vigyan Kendra Sirohi and sent to Famers of different blocks of Sirohi district viz.,Sirohi, Sheoganj, Abu road, Pindwara & Reodar through various channel like,whats app & text messages on mobile, newspaper, meghdoot app etc. on every Tuesday & Friday. The study was undertaken in all blocks of Sirohi district of Rajasthan. Broadcasting of Agro-met Advisory Bulletin is continued as it plays an important role in planning the farm operations.There are many farmers in district who has been benefited with agro advisory service but for the easy analysis and observation, response of 200 farmers are kept in this study. Responses recorded on the basis of block, farming situation, medium of weather forecasting information, usefulness of weather forecasting, agricultural operations done by use of agro advisory, satisfaction by advisory services, accuracy of agro advisory service, losses observed due to aberrant weather conditions.

Keywords: Agro advisory, DAMU, Indian meteorological department, weather forecasting

1. Introduction

Climate and weather information plays a vital role in cropping season as it affects crop growth and development from pre sowing to storage. The agricultural production could be brutally affected due increase in temperature, changes in rainfall pattern and variation in intensity of occurrence of extreme weather events like cyclone, flood and drought (Khobragade et al., 2014).

Tremendous actions can result in the defeat of human lives and livelihoods, minimized crop production, destruction of electricity distribution infrastructure and disruption to water supplies (Curtis et al., 2017; Connolly-Boutin and Smit, 2016; Masson-Delmotte et al., 2021; Ife-Adediran and Aboyewa, 2020).

The estimated yield loss on cereal crop due to both past and future climate change in different region indicate that the yield loss can be up to 35% for rice, 20% for wheat, 50% for sorghum, 13% for barley and 60% for maize depending upon location and projected year (Porter at al., 2014, Hansen et al., 2018). Data accuracy and

timely weather forecast along with relevant farm management options in the form of advisories will help to improve decision making ability of the farmers regarding various operations (Patel et al.,2018, Singh et al., 2020, Kumar et al., 2021).

The way to minimize the impact of intense weather is by improving weather forecasting and better communication of weather information. The facility to provide timely and precise weather forecasts offers the potential to decrease the defenselessness of people to the impacts of intense weather (Alley et al., 2019; Singh et al., 2018; Nost, 2019; Antwi-Agyei et al., 2021). Moreover, exact forecasting of weather variables remains a major challenge for the scientific community especially in tropical regions (Mani and Mukherjee, 2016). Aberrant weather conditions can be minimize by adopting proper management practices which finallyresults into increased production as well as their income from farm production(Dakhore at al., 2008). DAMU aims to provide weather forecasting information and Agromet advisory service (AAS) to whole farming community for application of best management practices or farm operation starting from pre sowing operations, selection of crop & variety according to rain forecast, irrigation & fertilizer application timing according to precipitation occurrence, application of plant protection measure, safe harvesting & storage etc. (Rathore et al., 2018). Increasing the accuracy of weather forecast's is critical for human's safety and protecting key economic sectors including agriculture, aviation, water, energy, and emergency response (Parker et al., 2021). In addition, gaps remain between the production of climate services, its use in decision-making, and the societal benefits derived from climate services (Webber, 2019; Harvey et al., 2021). The agriculture sector is by nature subtle to climate conditions and is also prone to the impacts of climate change (Parker et al., 2019). The Agromet Advisory Bulletin (AAB) also contains possible risk mitigation measures for major crops as well as livestock of a district (Rathore and Parvinder, 2008). District Agromet Units (DAMUs) are being set up in each identified district having KVKs to address the objectives of weather forecasting and agromet service at block level (Venkatasubramanian et al., 2014). The basic objective of establishment of DAMU includes to deliver crop and location specific AAS to block or village level farming community through invent the existing district level AAS. District Agromet Units will be act as nodal centre of the district to provide the requirements of agriculture service and extend it to allied areas like livestock for the benefit of the farmers. The principal objective of the present study was to assess the effectiveness and adaptation of block level agromet advisory service provided through DAMU among the all level of farmers and farming situations. This study also aims to check the response of farmers regarding accuracy of agromet advisory services, satisfaction level of farmers by service and loss observed due to aberrant weather observations.

2. Materials and Methods

Study was carried out by Krishi Vigyan Kendra, Sirohi, Rajasthan, India during November – December 2021. DAMU located at Krishi Vigyan Kendra, Sirohi, Rajasthan, India provides agromet advisory service for farming community of the district.All the five blocks of the district viz. Sirohi, Sheoganj, Abu road, Pindwara and Reodar were kept for the present investigation.

The average annual rainfall of the district is622 mm, which is erratic in nature and mostly confined during south west monsoon season. The temperature range of thedistrict varies from 6°C to 45°C, characterized by hot summer and moderate winters. Majority of the soil in district is mainly acidic in nature havingnormal water holding capacity and deficient in organic matter and nutrients.

2.1.Weather Data Collection

Observations of weather forecast data on rainfall, maximum and minimum temperature, wind speed and wind direction, maximum and minimum relative humidity,cloud cover taken from IMD website and broadcasted through different medium. Realized weather data of studied area were also collected from IMD and state meteorological observatories. After obtaining the forecast data and realized past weather data Agromet Advisory Bulletins (AAB) were prepared in consultation with the expert panel associated with DAMU, Sirohi.

2.2.Broadcasting of Weather Based AAB

Agromet advisory bulletin prepared in both Hindi and English language for easy understanding for farmers of the district and broadcasted regularly on every Tuesday and Friday through mobile message, facebook, whatsapp, newspaper, agricultural extension worker, input dealers, etc.The block specific weather forecast on various parameters for next five days and past three days realized weather data (from IMD stations) along with crop, soil and disease-pest related data were also collected to prepare the bulletins. The present study was undertaken on adaptation of AAS,usefulness, benefit, accuracy and satisfaction of weather forecasting among farmers of the districts.

2.3.Data Collection Method

The data were collected through google form developing some questionnaire and sent it among 200 farmers of all the five blocks of district.Datacollectedfrom thefarmers were classified, tabulated and analyzed in order to make the significant outcome. Appropriate statistical tools were employed to justify the results. A group of farmers following the AAS from the target village were selected randomly and farmers who are not following the same were also identified for the study.

3. Results and Discussion

Advisories based on medium range weather forecast help farmers in adopting suitable management strategies to weather sensitive farm operations such as selection of cultivar for a given agro climatic zone, sowing or transplanting window, fertilizer and irrigation scheduling, taking proper plant protection measures, date of crop harvesting etc. Maximum number of farmers used whats app media for dissemination or collection of weather based information followed by mobile messages (Figure 1), Similar trend were also reported by Das et al. (2022).

Data revealed in figure 2 that weather forecasting information is very useful in pesticide/herbicide spray followed by field preparation, sowing or transplanting, irrigation, harvesting, animal care and transportation of produce.

Farmers of Reodar and Sirohi block are more aware about AAS advisory service because it is clearly indicated from the data collected in respect to number of responded farmers (Table 1). As per 85% farmers openion that weather forecasting and agro advisory is most useful. Similar study was conducted on usefulness of AAS to the farmersThakur et al. (2020).

Highest number of farmers agreed with satisfaction (114)due to forecasting and advisory services followed by partially satisfied (37), highly satisfied (35) and unsatisfied (14) (Table 2). Facts reported regarding accuracy of forecasting and agro advisory showed that accuracy is 75 to 90%, which was agreed by 75 farmers among total number of farmer's (200). Forty four per cent Farmers opinion showed that production loss in a year is more that 30%due to aberrant weather conditions (Table 1) (Vashishth et al. (2013) also reported similar results). Maximum number of farmers supported that 20 to 30% more benefit earned due to forecast and agro advisory in animal production and poultry.

Table 1: Response of farmers in respect to blocks, production loss observed and benefit by forecast &agro advisory					
Block	Number of responded farmers	Production loss in one year due to aberrant weather condition	Number of responded farmers	Benefit by forecast and agro advisory in animal production and poultry	Number of responded farmers
Abu road	5	0–5%	9	0–5%	32
Pindwara	27	5–10%	17	5–10%	30
Reodar	83	10–20%	39	10–20%	45
Sheoganj	37	20–30%	48	20–30%	55
Sirohi	48	> 30%	87	> 30%	38

Table 2: Response of farmers in respect to accuracy of forecast farming situation and satisfaction of farmers					
Accuracy of forecast and agro advisory	Number of responded farmers	Farming situation	Number of responded farmers	Satisfaction by forecast and agro advisory	Number of responded farmers
90–100%	38	Irrigated	111	Highly satisfied	35
75–90%	75	Un-irrigated	9	Satisfied	114
50–75%	70	Partially irrigated	80	Partially satisfied	37
<50%	17			Unsatisfied	14

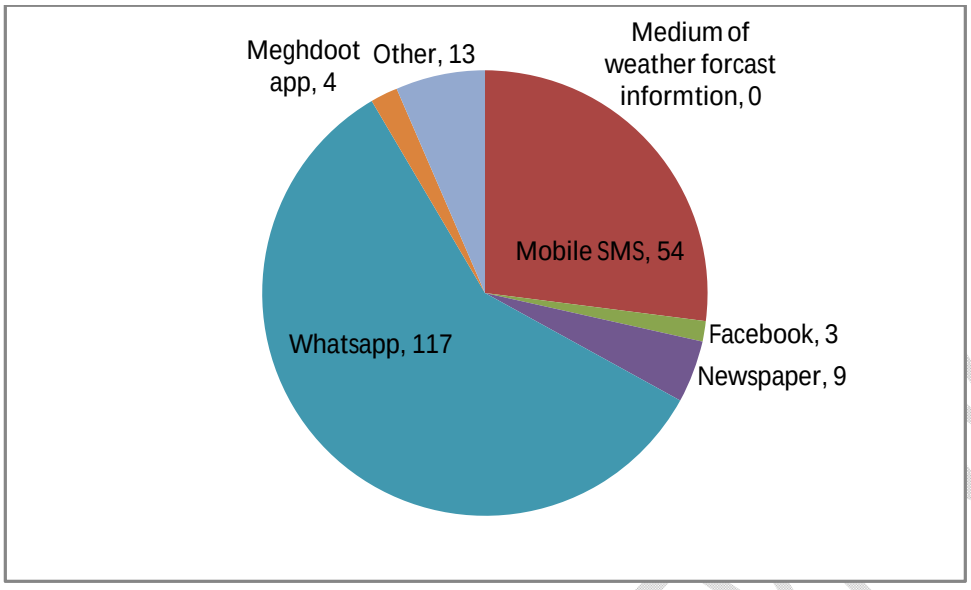

Figure 1: Medium of broadcasting of forecast information

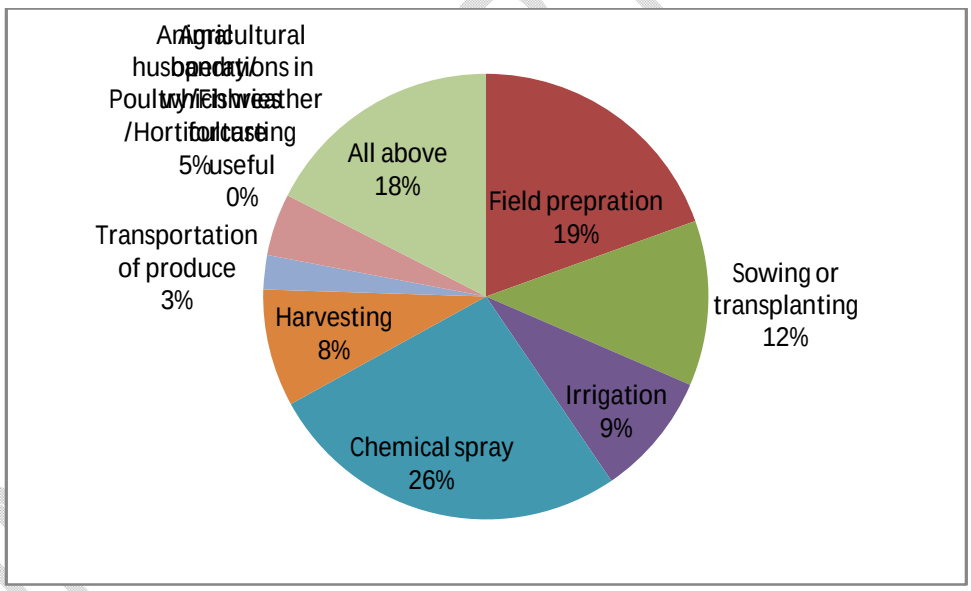

Figure 2: Agricultural operation in which weather forecasting useful

4. Conclusion

It can be concluded from the study that implementation of agro-met advisory service through establishment of DAMU in Sirohi district of Rajasthan is very useful for farmers to avoid losses of the crop yield due to abnormal weather condition. The application of agro met advisory bulletin based on current and forecasted weather is a prospective tool for enhancing the production and farm income through judicious and timely utilization of inputs.

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