



POPULAR ARTICLE

Empowering villages through weather awareness and sustainable management among the farmers of Raipur district

P.K. Sahu¹, R.K. Thakur², S. Nishad³, S. Yogi⁴

1 Department of Agriculture meteorology, Indira Gandhi Krishi Vishwavidyalaya, Raipur-492 012, Chhattisgarh, India

2 Department of Sports, Indira Gandhi Krishi Vishwavidyalaya, Raipur-492 012, Chhattisgarh, India

3 Department of National Service Scheme, Indira Gandhi Krishi Vishwavidyalaya, Raipur-492 012, Chhattisgarh, India

4 Department of Agricultural Extension Education, Indira Gandhi Krishi Vishwavidyalaya, Raipur-492 012, Chhattisgarh, India

Corresponding authors email: Premsahu8333@gmail.com

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Intricacies of the subject

Weather variability is one of the major factors affecting agricultural production and farm livelihoods. Timely and understandable weather information can help farmers make better decisions regarding sowing, irrigation, fertilizer application, pest and disease management, harvesting and protection against extreme weather. The India Meteorological Department (IMD), through its Gramin Krishi Mausam Sewa (GKMS), provides weather-based agrometeorological advisories to support such decisions. The present initiative, “Empowering Villages Through Weather Awareness and Sustainable Management Among the Farmers of Raipur District,” focuses on improving farmers’ understanding of weather information and encouraging sustainable farm-management practices. Farmers can be trained to interpret rainfall forecasts, temperature, humidity, wind speed,

dry spells and warnings and relate these parameters to crop operations. Awareness activities may include farmer meetings, village-level demonstrations, weather-awareness campaigns, use of mobile weather applications and dissemination of local-language advisories. IMD currently provides district- and block-level agrometeorological bulletins and advisories through its agricultural meteorological services.

Introduction

Agriculture is highly dependent on weather conditions. Variations in rainfall, temperature, humidity, sunshine and wind can influence crop growth, water requirements, pest and disease development and harvesting operations. Although weather cannot be controlled, its adverse effects can often be reduced through timely information and appropriate management. IMD specifically



identifies weather information and properly interpreted farm advisories as important tools for reducing agricultural risk. For farmers of Raipur district, weather awareness can support climate-smart and sustainable agriculture by helping them select appropriate sowing periods, schedule irrigation according to crop and weather conditions, avoid unnecessary farm operations before rainfall, adopt suitable pest-management measures and protect harvested produce during adverse weather. India has a long history of agricultural weather services. The Agricultural Meteorology Division of IMD was established at Pune in 1932. Weather services specifically for farmers began with the Farmers' Weather Bulletin in 1945. Agrometeorological Advisory Services were subsequently developed to convert weather forecasts into agricultural recommendations. District-level services were expanded through collaboration between IMD, ICAR and State Agricultural Universities.

Importance at the global level

At the global level, weather awareness is increasingly important because agriculture is exposed to climate variability and extreme weather. Farmers need information about both short-term weather events and longer-term climate trends.

Applications

The major applications include selection of suitable planting time, irrigation scheduling, protection against drought and excessive rainfall, pest and disease management, harvesting and post-harvest planning, livestock and fisheries management, disaster preparedness, efficient use of water and other agricultural inputs.

Advantages of weather awareness

- **Better crop planning-** helps select suitable

dates for sowing and other operations.

- **Efficient irrigation** – Farmers can adjust irrigation according to expected rainfall.
- **Reduced input losses** – Helps avoid unnecessary fertilizer and pesticide applications before rainfall.
- **Better pest and disease management** – Weather conditions can be used as an early indicator of favourable conditions for pests and diseases.
- **Improved harvesting decisions** – Forecast information can help farmers plan harvesting and drying. Reduced weather-related losses – Early warnings allow farmers to take preventive measures.
- **Improved resource-use efficiency** – Better timing can reduce unnecessary use of water, fertilizer and labour.
- **Climate resilience** – Regular access to climate information can improve farmers' ability to adapt to changing weather conditions.

Disadvantages and limitations

Forecast uncertainty- Weather forecasts are not always completely accurate.

Limited digital access- Some farmers may have limited access to smartphones, internet or digital platforms.

Literacy and language barriers- Technical weather information may be difficult to understand without proper extension support.

Poor last-mile communication- Information may not always reach every farmer at the required time.

Local variability- Weather can differ considerably over short distances, especially during thunderstorms and rainfall events.

Limited capacity to act- Small and marginal farmers may receive useful information but lack sufficient irrigation, machinery or



financial resources or implement recommended actions.

Dependence on timely dissemination- Even an accurate forecast has limited usefulness if it reaches farmers after the relevant farm operation.

Information overload- Multiple sources of weather information can sometimes create confusion if farmers receive conflicting forecasts. Therefore, weather awareness programmes should focus on simple, local, actionable and reliable information rather than merely distributing technical weather data.

Major activities

Educating farmers about rainfall, temperature, humidity, wind and extreme-weather warnings. Explaining how forecasts can be used for sowing, irrigation, fertilizer application, spraying and harvesting. Promoting rainwater harvesting, farm ponds, efficient irrigation and conservation of soil moisture. Encouraging soil testing, balanced fertilizer use, organic manures, crop residues and integrated nutrient management. Promoting crop diversification and management practices that reduce vulnerability to weather variability. Encouraging farmers to use reliable weather and agrometeorological advisory services available through mobile and digital platforms. IMD and ICAR have developed systems for disseminating weather-based advisories to farmers.

Sustainable management practices

Weather awareness becomes more useful when it is combined with sustainable resource management. Farmers can use rainfall forecasts to improve irrigation planning and avoid unnecessary water application. Soil testing and balanced nutrient application can improve nutrient-use efficiency, while organic

inputs, crop residues and crop diversification can contribute to soil health. ICAR also highlights integrated soil-fertility management and the use of weather advisories as components of sustainable farming.

Expected outcomes

The programme can help to increase farmers' understanding of weather information, improve timely farm decision-making, reduce weather-related production risks, promote efficient use of water, fertilizers and other inputs, encourage sustainable and climate-resilient agricultural practices and strengthen communication between farmers, agricultural institutions and weather-service agencies.

Conclusion

Weather awareness is an important component of sustainable agriculture, as weather conditions directly influence sowing, irrigation, fertilization, pest and disease management, harvesting and post-harvest operations. Timely and location-specific weather information enables farmers to plan farm activities according to expected rainfall, temperature, humidity and extreme weather events. IMD's agrometeorological advisory services aim to convert weather forecasts into practical, crop-specific recommendations for farmers. At the village level, such advisories can help farmers take timely decisions, reduce unnecessary use of water and agro-inputs, and minimize weather-related crop losses. Weather education can further improve farmers' understanding of forecasts, warnings and their implications for different crops. In Raipur district, integrating weather information with sustainable water and soil management can strengthen farm-level preparedness. Active participation of farmers, extension personnel and local institutions can improve the dissemination and use of advisories. Thus, a village-level weather awareness approach can



contribute significantly to resilient and sustainable farming communities.

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