

## AGRICULTURE FORUM FOR TECHNICAL EDUCATION OF FARMING SOCIETY

Kota, Rajasthan



### Use of Weather Forecast in Farming

#### Authors

Ramanand Patel

Scientist (Agrometeorology), Regional Research Station  
Zone- | Agwanpur -852202 Saharsa, Bihar, BAU Sabour

### INTRODUCTION

Agriculture relies heavily on weather and climate conditions, making it vulnerable to variability and extreme events. Factors such as rainfall distribution, temperature changes, humidity levels, and wind speed are crucial for crop growth and development. The increasing number of unpredictable weather events like droughts, floods, heatwaves, and unseasonal rainfall create significant challenges for farmers. These uncertainties can lead to crop failures, lower yields, and economic losses. In this context, weather forecasting has become a vital tool that helps farmers anticipate weather changes and adopt suitable management strategies. By using weather information effectively, farmers can lower risks, boost productivity, and improve the overall efficiency of agricultural operations.

Weather is a key factor in agricultural production because it affects crop growth, development, and yield. Changes in rainfall, temperature, humidity, and wind patterns can greatly influence farm operations and productivity. Weather forecasts help farmers make timely and informed decisions regarding practices like sowing, irrigation, fertilization, pest control, and harvesting. With improvements in meteorological science, remote sensing, and digital technology, weather-based farming has become essential for reducing risks, using resources more efficiently, and ensuring sustainable agricultural production. This article discusses the importance, types, applications, benefits, challenges, and future prospects of weather forecasting in agriculture.



1

### 2. Types of Weather Forecasts Used in Agriculture

#### Short-term Forecast (1–3 days)

Short-term weather forecasts provide details about immediate weather conditions and are valuable for daily farm operations. Farmers rely on these forecasts for scheduling irrigation, applying pesticides, and planning harvesting activities. For example, avoiding pesticide application before rain helps prevent chemicals from washing away and improves their effectiveness.

#### Medium-term Forecast (3–10 days)

Medium-term forecasts help farmers plan short-term agricultural activities like sowing, fertilizer application, and other operations. These forecasts allow farmers to prepare for upcoming weather and adjust their practices accordingly.

#### Long-term Forecast (Seasonal Forecast)

Long-term or seasonal forecasts offer an overview of expected weather patterns over an extended period. These forecasts are especially useful for crop planning, selecting suitable crops and varieties, and determining cropping patterns. Farmers can also use this information for efficient resource allocation and risk management.

### 3. Applications of Weather Forecast in Farming

#### (i) Crop Planning and Sowing

Weather forecasts assist farmers in identifying the best time for sowing crops by considering rainfall probability and temperature conditions. Timely sowing ensures better germination and crop establishment.

#### (ii) Irrigation Management

Rainfall forecasts enable farmers to optimize irrigation scheduling by avoiding unnecessary watering before expected rain. This conserves water, reduces energy use, and lowers irrigation costs.

#### (iii) Fertilizer Application

Weather information helps farmers apply fertilizers at the right time, preventing nutrient losses from heavy rainfall or high temperatures. This improves nutrient use and promotes crop growth.

#### (iv) Pest and Disease Management

Many pests and diseases depend on weather conditions like humidity and temperature. Weather forecasts help

2

predict outbreaks and allow farmers to take preventive or control measures on time, minimizing crop damage.

#### (v) Harvesting Decisions

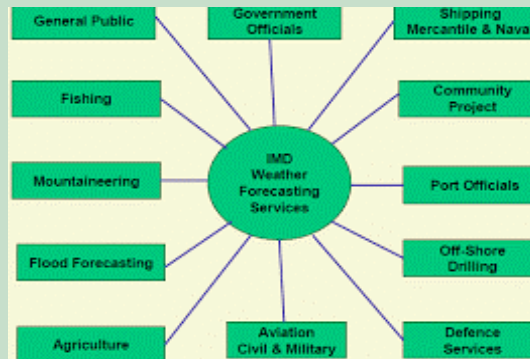
Forecasting is vital for planning harvesting operations. Farmers can avoid harvesting during unfavorable weather, such as rain or storms, reducing post-harvest losses and maintaining crop quality.



#### 4. Benefits of Using Weather Forecast in Agriculture

Using weather forecasts in agriculture has several advantages. It helps reduce risks linked to bad weather by enabling timely preventive actions. Better timing of agricultural operations increases crop productivity and yields. Efficient use of resources like water, fertilizers, and labor results in cost savings and greater profits. Additionally, weather-based farming practices support adaptation to climate change by helping farmers manage variability and uncertainties in weather patterns.

- ✓ **Risk Reduction:** Minimizes crop damage due to adverse weather
- ✓ **Improved Productivity:** Better timing of farm operations enhances yield
- ✓ **Efficient Resource Use:** Saves water, fertilizers, and labor
- ✓ **Cost Reduction:** Avoids unnecessary inputs and losses
- ✓ **Climate Adaptation:** Helps farmers cope with climate variability



#### 5. Tools and Technologies

Technological advances have made weather forecasting easier and more reliable for farmers. Mobile weather advisory services provide real-time information directly to farmers. Agro-meteorological bulletins from research institutions offer region-specific advice. Satellite-based weather monitoring systems enhance forecast accuracy. Additionally, smartphone apps and SMS alert systems provide timely weather updates, allowing farmers to act quickly.

- ✓ Mobile-based weather advisory services
- ✓ Agro-meteorological bulletins
- ✓ Satellite-based weather monitoring
- ✓ Apps and SMS-based alerts for farmers

#### 6. Challenges in Adoption

Despite its benefits, adopting weather forecasting in agriculture faces several challenges. Lack of awareness and knowledge among farmers hampers effective use. In many areas, access to accurate, location-specific weather forecasts is still lacking. Farmers may also struggle to interpret technical weather data and make practical decisions. Moreover, limited extension services and support systems hinder widespread adoption of weather-based farming practices.

- ✓ Lack of awareness among farmers
- ✓ Limited access to accurate local forecasts
- ✓ Difficulty in interpreting weather data
- ✓ Inadequate extension services

#### 7. Future Prospects

The future of weather forecasting in agriculture looks promising due to advancements in digital technology and data analysis. Combining weather data with artificial intelligence and machine learning can improve forecast accuracy and reliability. Developing location-specific and crop-specific advisories will enhance decision-making at the farm level. Expanding digital platforms and mobile apps will make these resources more accessible for farmers. Strengthening agro-meteorological infrastructure and extension services will be crucial for promoting weather-based farming practices.

- ✓ Integration of weather data with Artificial Intelligence (AI)
- ✓ Development of location-specific forecasts
- ✓ Expansion of digital advisory services
- ✓ Strengthening agro-meteorological infrastructure

#### CONCLUSION

Weather forecasting is a powerful tool that significantly aids modern agriculture by supporting informed decision-making and reducing risks related to weather variability. Its effective use improves crop productivity, optimizes resource use, and ensures sustainability in farming systems. Raising farmer awareness, enhancing forecast accuracy, and strengthening support systems are vital for maximizing the benefits of weather-based agriculture. As climate change continues to impact agricultural systems, the role of weather forecasting will become even more critical for ensuring food security and sustainable development.