Weather-Based Agro-Advisories: A Boon for Risk-Prone Farming in India and Telangana

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Abstract

Indian agriculture is highly vulnerable to climate variability, particularly in rainfed regions. Weather-based agro-advisories (AAS) have emerged as critical tools to support farmers in managing risks. These advisories provide real-time, location-specific guidance on sowing, irrigation, pest control, and harvesting. Powered by IMD and ICAR through the GKMS network, they are disseminated via mobile apps, SMS, and local language broadcasts. Telangana's KVKs and NGOs are pioneering last-mile delivery through innovative channels. Extension services play a vital role in interpreting and localizing these advisories. Case studies show significant gains in yield, cost savings, and risk reduction. Apps like Meghdoot and platforms like WhatsApp further enhance outreach. However, challenges such as forecast accuracy and digital divide remain. Strengthening agromet infrastructure and inclusive communication strategies can make agro-advisories the backbone of climate-resilient agriculture.

Introduction

For decades, Indian farmers have been at the mercy of the monsoon. In a country where over 60% of agriculture is rainfed, farming has always been a gamble. One failed rain, an unexpected hailstorm, or a prolonged dry spell can devastate an entire cropping season. In the age of climate change, these uncertainties are no longer occasional—they're frequent, intense, and unpredictable. In this context, weather-based agro-advisories (AAS) are emerging as a lifeline for farmers, especially small and marginal ones. These advisories offer science-backed, real-time information, enabling farmers to take informed decisions about sowing, irrigation, fertilization, pest control, and harvest — thereby minimizing losses and maximizing yields. Let's explore how this system works, its impact across India and Telangana, and how it is shaping the future of climate-smart agriculture.

Keywords: Agro-advisors, Climate change, Monsoon and Extension

What are Weather-Based Agro-Advisories?

Agro-advisories are customized agricultural recommendations provided to farmers based on short-, medium-, or long-range weather forecasts. They are designed to help farmers adapt their practices to changing weather conditions and reduce the risks associated with extreme climate events.

These advisories typically include:

- Weather outlooks (rainfall, temperature, wind)

- Crop-specific guidance (sowing dates, irrigation schedules, disease alerts)

- Pest and disease forecasts and preventive measures

- Fertilizer and pesticide timing

- Harvest and post-harvest suggestions

Advisories are updated bi-weekly or weekly, and disseminated through multiple channels like:

- SMS and voice calls (IVR)

- Mobile apps

- WhatsApp groups

- Kisan Call Centres

- Local radio, community TV

- Display boards at KVKs and Panchayats

The Institutional Backbone: GKMS and Beyond

The backbone of weather-based agro-advisory in India is the Gramin Krishi Mausam Sewa (GKMS) program, jointly operated by:

- India Meteorological Department (IMD)

- Indian Council of Agricultural Research (ICAR)

- State Agricultural Universities (SAUs)

- Krishi Vigyan Kendras (KVKs)

There are over 130 Agromet Field Units (AMFUs) located in SAUs and ICAR institutes which interpret IMD weather forecasts and prepare advisories. These advisories are location-specific and tailored to crops, climate, and farmer practices in the region.

In Telangana:

- GKMS is operational through KVK Jammikunta (Karimnagar), KVK Malyal (Mahabubabad), CRIDA KVK (Rangareddy) and several AMFUs under PJTSAU.

- The state is also home to Agromet Advisory Units that produce advisories in Telugu, enhancing accessibility.

- NGOs like Centre for Sustainable Agriculture (CSA), Sankalp, and others are helping with last-mile delivery of these advisories to tribal and remote farming communities.

Extension's Role in Bridging Science and Soil

Weather data alone isn't useful unless it's translated into actionable advice. This is where agricultural extension systems come in.

Key Functions of Extension in Weather Advisory:

1. Localization of Advice: Extension officers work with agromet units to adapt national forecasts to local crop calendars.

2. Capacity Building: Organizing trainings and workshops to help farmers interpret and apply advisories.

3. Communication Channels: Creating WhatsApp groups, community radio programs, and village weather boards.

4. **Feedback Loops:** Collecting farmer feedback and reporting ground-level anomalies to meteorologists and scientists.

In Telangana, many KVKs are experimenting with automated advisory delivery systems, where farmers receive a Telugu voice message before an extreme weather event. This builds trust and timely action.

Impact on the Ground: Real Benefits to Farmers

Weather-based advisories are making a tangible difference across India.

Economic Benefits:

- 10–30% increase in yields

- 15–25% reduction in input costs

- Significant savings in pesticides, fertilizers, and water usage

Risk Mitigation:

- Early warning systems help avoid germination failures, pest outbreaks, and post-harvest losses.

- In drought-prone areas like Mahabubnagar and Nalgonda, advisories are enabling climate-resilient crop choices and intercropping systems.

Farmer Empowerment:

- Encourages scientific decision-making over traditional guesswork.

- Enhances confidence among youth in farming, improving their interest in agri-entrepreneurship.

Case Studies from Telangana

Ravinder – Cotton Farmer, Warangal

When a September forecast predicted continuous rainfall, Ravinder postponed urea topdressing by a week. His neighbor didn't—and lost much of his fertilizer investment to runoff. Ravinder saved ₹2,000 per acre and got better crop vigor.

Anitha – Paddy Grower, Rangareddy

With advisory inputs from CRIDA KVK, Anitha adopted the SRI method after advisories suggested below-normal rainfall. Her water use reduced by 40%, and she got higher tillering and yield than the conventional method.

Venkatesh – Groundnut Farmer, Karimnagar

Using WhatsApp-based advisories from KVK Jammikunta, Venkatesh treated an early leaf spot infestation before it spread. "I used to spray after seeing symptoms. Now I prevent them," he says.

Technology Enhancing Agro-Advisories

The role of digital tools is rapidly increasing:

Tool	Purpose
Meghdoot App	IMD's mobile app for district-wise advisories
Damini App	Lightning alerts and thunderstorm tracking
Kisan Suvidha	General agricultural updates including weather
State-Level Apps	E.g., "RythuNestham" app in Telangana
WhatsApp Groups	Used by KVKs to broadcast agro-climatic advice
AI-based Tools	Predictive models for pest outbreaks (being piloted by PJTSAU and AgHub)

Agro-Advisory as a Pillar of Climate-Resilient Agriculture

Weather-based advisories align directly with India's National Mission on Sustainable Agriculture (NMSA) and climate-resilient development goals. They help in:

- Promoting climate-smart crop planning

- Strengthening crop insurance claim validation

- Guiding drought and flood contingency planning

- Reducing GHG emissions by avoiding overuse of inputs

Challenges That Need Addressing

While impactful, several barriers persist:

1. Accuracy of Forecasts at micro-levels can vary, causing distrust.

2. Last-mile gaps due to digital divide in tribal and backward regions.

3. Lack of local language content or culturally relevant communication.

4. Poor two-way communication – farmers can't always respond or clarify doubts.

Addressing these requires community-level weather champions, more automated advisory systems, and public-private collaboration in data dissemination.

The Way Forward

To make agro-advisories more inclusive and effective:

- Strengthen District Agromet Units (DAMUs) at KVKs

- Ensure 100% localization of advisories in local dialects

- Include women and landless workers in advisory networks

- Promote weather-based crop insurance integration

- Create 'Smart Village Weather Hubs' with real-time updates and dashboards

Conclusion

In a time when climate uncertainty is the new normal, weather-based agro-advisories offer certainty. They

empower farmers with knowledge, minimize risk, and enhance the productivity and sustainability of Indian agriculture.Telangana's experience shows that with robust extension support, technology integration, and farmer engagement, these advisories can become a cornerstone of future farming — where the sky is not a threat, but a trusted guide.

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