"Empowering Farmers Through Scientific Rainfall Forecasts: The ASR District Success Story"

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Introduction:

Indian agriculture is heavily dependent on weather conditions, and unexpected climatic events often lead to significant crop losses each year. Accurate and timely weather forecasts can help farmers in Alluri Sitarama Raju district reduce these risks by adjusting crop choices, modifying sowing and harvesting schedules, and managing inputs such as irrigation and fertilizers more effectively.

In this district, the GKMS unit at the Regional Agricultural Research Station (RARS), Chintapalli, prepares agrometeorological advisories every Tuesday and Friday in both Telugu and English. These bulletins provide five-day weather forecasts along with guidance for crop, livestock, and allied activities. By receiving these updates through WhatsApp and local networks, farmers are better equipped to respond to rainfall variations, pest infestations, and other emerging challenges relevant to the district's hilly terrain.

This exercise examines how farmers across different blocks perceive, adopt, and apply these advisories to make practical decisions at the farm level. However, a comparison of forecasted and actual rainfall patterns revealed notable deviations. During the months from March to September, actual rainfall consistently exceeded the forecast, with the disparity particularly pronounced in July (416.2 mm compared to a forecast of 205.4 mm) and September (313.0 mm compared to 266.2 mm). Such underestimation during the monsoon could affect water management and crop planning. Conversely, in the early months (January–March), actual rainfall was substantially lower than forecast, illustrating overestimation during the dry season. These mismatches underscore the challenges that inaccurate forecasts pose to farmers in planning irrigation schedules, crop protection measures, and other key farm activities.
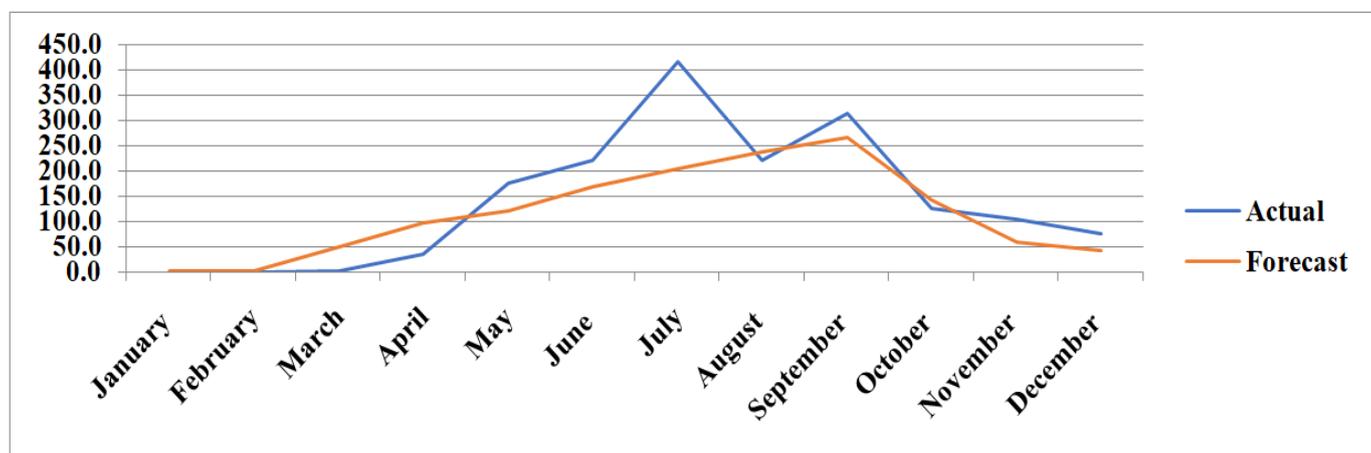

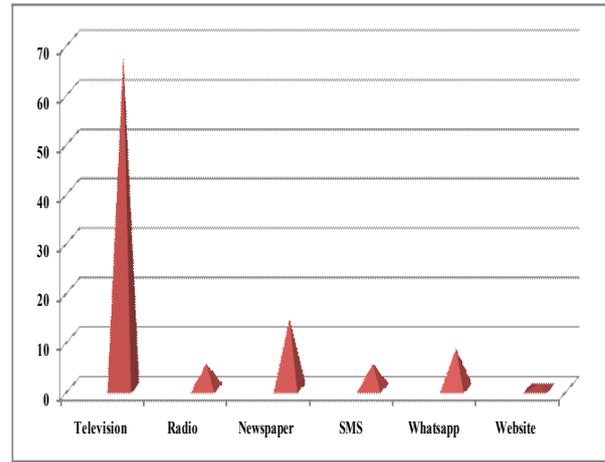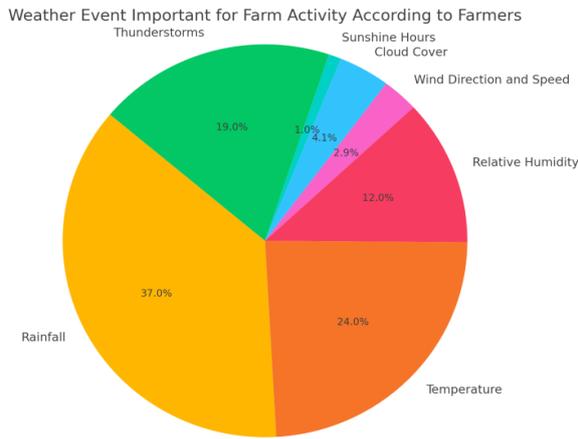**Fig.1: Actual vs Forecast rainfall (mm) data for 2024**

Fig. 2: Weather event most important for farm activity.

Fig. 3: Medium preferred by farmers

The data recorded from the sampled farmers to know that which weather event was most important for farm operations, Fig. 2 showed that 37.0 percent of farmers felt that forecast related to rain was very helpful for taking prior farm management decisions like sowing, irrigation, chemical spray and harvesting operation etc. followed by 24.0 percent as temperature, 19.0 percent as thunderstorm and 12.0 percent as relative humidity. Weather events like sunshine hours, wind, cloud cover etc. was given less importance. The agromet advisories were disseminated to the farmers through various modes of communication like Radio, Television, Newspapers, SMS, WhatsApp etc. The Fig. 3 showed farmers preferred television (67%) medium for receiving information followed by newspaper (14%) and whatsapp (8%). Similar results reported by Ramachandrappa et al., (2018).

Fig 4: Farmer's satisfaction towards forecast and operations of IMD
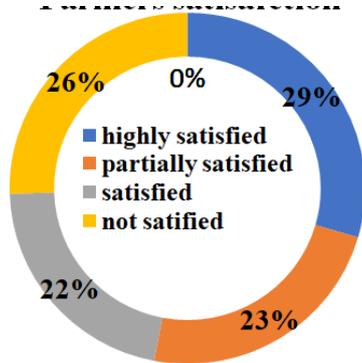
From results (Fig. 4), it is also showed that 29 percent of farmers were presently highly satisfied, 26 percent were not satisfied, 23 percent were partially satisfied and 22 percent farmers were satisfied with forecast issued by the IMD
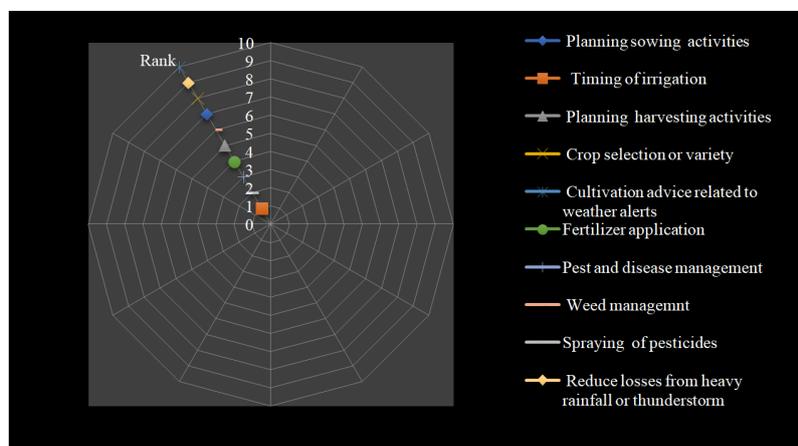

Fig. 5: Farm operation for which weather forecast/ Agromet advisories are found useful

Based on the ranking data (where 1 is the highest priority), farmers consider irrigation timing based on rainfall (Fig. 5) advisories as the most important benefit of agro advisory services, followed by the relevance of pest and disease management advisories and the usefulness of weed management information. Rainfall forecasts for harvesting and fertilizer application advice are also valued, but to a lesser extent. Lower priority is given to aspects like crop selection recommendations and loss reduction from heavy rainfall or thunderstorms. This indicates that actionable, weather-based advice especially for irrigation and pest management is most critical for farmers' decision-making.

Farmers' Success Story: Empowering Tribal Farmers with Rainfall Forecasts in ASR District

In the hilly landscapes of **Alluri Sitharama Raju (ASR) district**, farming is not just a livelihood—it is life itself. For years, farmers in **G. Madugula, Paderu, and Chintapalle mandals** struggled with one common challenge: **unpredictable rainfall**.

The Problem Before

Farmers recall how sudden rains after sowing washed away seeds, how prolonged dry spells withered young crops, and how unexpected showers damaged harvested produce left for drying in the open. Decisions on sowing, fertilizer application, or spraying pesticides were often a gamble. Many farmers incurred losses despite their hard work.

A Ray of Hope

The turning point came when scientific rainfall forecasts started reaching these remote tribal villages through the Agro-Meteorological Field Unit (AMFU) and GKMS services. Farmers began receiving timely weather advisories on their mobile phones, through WhatsApp groups, and even on radio programs. These advisories were simple, clear, and specific to their crops and villages.

How Farmers Benefited

- In **G. Madugula**, maize and ginger farmers adjusted their sowing dates according to rainfall predictions. Ginger growers, who earlier suffered heavy losses due to seed rot, now ensure proper drainage when heavy rainfall is forecast.

- In **Paderu**, coffee and turmeric farmers plan their harvest and drying activities with confidence. Earlier, sudden showers would spoil coffee beans, but now they schedule drying based on the advisory.

- In **Chintapalle**, maize and vegetable growers use forecasts to time fertilizer application and pesticide sprays. Instead of spraying before rain (and losing money), they wait for a dry spell, saving costs and improving crop health.

Farmers Speak:

Success Story:1- Dasari Veeranna Padal – A Model Farmer
Location: *Sapparla* ,Chintapalle mandal , Alluriseetharama raju District, Andhra Pradesh
Crop: Paddy (hilly Wetland Cultivation) 1.8 ha paddy area

Background

Dasari Veeranna Padal, a progressive paddy farmer, faced inconsistent crop yields due to unpredictable rainfall and lack of timely guidance on crop management. Seeking solutions, he turned to Agrometeorological

Advisory Services (AAS) for expert guidance.

Adoption of Scientific Practices:

Following AAS bulletins AMFU,GKMS Chintapalle , he implemented recommended practices:

- Seed Selection & Sowing: Timely sowing with optimal seed rate.

- Weed & Pest Management: Scheduled herbicide and pesticide applications based on advisories.

- Harvest Planning: Monitored weather forecasts to schedule harvesting.

Key Intervention:

On 14 November 2024, Dasari Veeranna Padal initially planned to harvest, but a forecasted rainfall alert from AAS prompted him to delay. Acting on the advice, he adjusted harvest timing, preventing potential crop damage.

Outcome

- Enhanced Germination: Timely sowing ensured uniform crop emergence.

- Improved Yield: Effective pest management increased productivity.

- Risk Mitigation: Weather alerts prevented post-harvest losses due to unexpected rainfall.

Impact

Dasari Veeranna padal 's experience demonstrates the power of integrating weather forecasts with farm management:

- Increased income and reduced crop risk.

- Became a role model for neighboring farmers, promoting adoption of climate-smart practices.

Success Story 2: Kavadam somalingam – Weather-Smart Farming
Location: Kommangi, GK Veedhi mandal , Alluriseetharama raju District, Andhra Pradesh
Crops: Coffee/ pepper, Maize and Groundnut (2.1 ha)

Background

During the Kharif season, **Kavadam somalingam** faced repeated interruptions in farm operations due to unexpected rainfall. This led to **higher costs** when he had to repeat operations such as manure application weeding and neem oil spraying.

Adoption of AAS Services

- Joined the **DAMU WhatsApp group** for Agrometeorological Advisory Services (AAS).

- Began **planning farm operations and labor** according to **rainfall alerts and weather forecasts**.

  Practical Example

- **Planned Operation:** Neem oil,Agnastram spraying for **tobacco caterpillar on 9th August 2024**.

- **Action Taken:** Received a rainfall alert and **postponed spraying by one day**.

- **Outcome:**

  o Avoided rainfall interruption.

  o Reduced the need for a **second pesticide spray**, saving cost and labor.

- Meanwhile, neighboring farmers who did not follow AAS advisories had **sprayings disrupted by rain**, leading to repeated applications.

Overall Impact

- Efficient **farm operation scheduling** according to weather.

- **Cost-saving** and reduced labor.

- Encouraged other farmers in the region to **adopt weather-based farm management**.

Photographs :

AMFU Chintapalle is actively reaching remote tribal areas and conducting field-level demonstrations and strong emphasis on direct farmer interaction, ensuring that advisories are practical and understandable.

Hands-onLearning at AMFU, Chintapalle :: the practical exposure given to students on agro-meteorological instruments like the Cup Counter Anemometer enable them understand how weather data is collected and used in agriculture.