Pre-Read: Agricultural Use Cases for Forecast Generation and Benchmarking

Workshop 1 – May 30, 2025

Overview

As part of the AIM for Scale Weather Partnership Convening, Workshop 1 will focus on identifying high-priority agricultural use cases—key decisions made by farmers and other stakeholders in the agriculture sector—that could be improved through the use of weather and climate forecasts. These use cases will help guide country-level prioritization, inform forecast benchmarking, and shape the design of forecast products and dissemination systems.

Because agricultural decision-making is highly context-specific, use cases will vary significantly across countries, cropping systems, and local institutions. This document shares a set of illustrative use cases in advance of the session to help participants begin reflecting on which decisions are most relevant in their national context, if any are not included in the pre-identified list of use cases—and where forecast information could add the most value.

We will explore these use cases more deeply during the workshop. We are sharing this now in case participants would like to review the examples and arrive with initial ideas for discussion.

Participant note

All convening participants, including those from national meteorological and hydrological services (NMHS) and ministries of agriculture, are encouraged to participate in this session.

Illustrative Agricultural Use Cases for Forecast-Sensitive Decision-Making

These examples are grouped by key phases in the agricultural decision cycle. Each represents a point where timely, accurate forecast information could influence decision-making and improve outcomes.

1. Pre-season strategic planning

- **Crop and varietal selection:** Selecting crops or seed varieties based on expected seasonal rainfall, temperature anomalies, or early warning of extreme events.

- **Land allocation decisions:** Adjusting planted area or crop mix based on forecast confidence, particularly under scenarios of delayed onset or below-normal rainfall.

- **Plowing and land preparation:** Timing land preparation activities to align with onset forecasts and anticipated rainfall patterns.

- **Labor and input contracting:** Aligning financing and logistics for input procurement, labor hiring, or machinery rental with expected season start and reliability.

- **Diversification into off-farm activities:** Proactively shifting labor or investment to alternative livelihoods in the face of pessimistic forecasts to buffer income shocks.

2. In-season operational management

- **Sowing and planting timing:** Determining optimal planting windows based on forecasts of rainfall onset, dry spell probability, and soil moisture thresholds.

- **Irrigation scheduling:** Adjusting irrigation frequency and quantity using short-term rainfall forecasts to optimize water use and crop health.

- **Fertilizer application timing:** Timing input applications to reduce runoff risk from forecasted heavy rainfall or leaching under saturated soil conditions.

- **Pest and disease management:** Using temperature, rainfall, and humidity forecasts to anticipate and manage pest or disease outbreaks (e.g., locusts, armyworm).

- **Mid-season drought or flood contingency:** Identifying management responses during the growing season based on updated forecasts or early warnings.

- **Temperature-sensitive crop monitoring:** Applying forecasted temperature data to support phenology management and prevent heat stress during critical growth phases.

- **Harvest timing:** Planning harvest to avoid forecasted rains that could damage crops or hinder field access.

- **Threshing and drying:** Scheduling threshing and post-harvest drying operations during forecasted dry periods to minimize post-harvest losses.

- **Transport and logistics planning:** Aligning crop movement and market timing with short-term forecasts of weather disruptions or road conditions.

3. Risk reduction and institutional support

- **Early warning and disaster preparedness:** Activating community-level, institutional, or market responses based on alerts for extreme weather events (floods, droughts, heatwaves).

- **Index-based insurance and risk financing:** Designing, triggering, and adjusting insurance products using seasonal or sub-seasonal forecasts and climate risk models.

Next Steps

At the convening, participants will:

- Identify which of these use cases are most applicable in their national context.

- Add or refine use cases to reflect local cropping systems, risk profiles, and institutional arrangements.

- Begin linking these priority use cases to required forecast types, delivery mechanisms, and performance benchmarks.

This exercise is a foundational step toward a demand-driven approach to forecast generation and investment planning.