

Pre-Read: Identifying Training Needs and Developing a Weather Forecasting Curriculum

Workshop 2.1 – May 30, 2025

Overview

As part of the AIM for Scale Weather Partnership Convening, Workshop 2.1 will focus on validating and strengthening the curriculum for an upcoming AI Weather Forecasting Training Program. The curriculum is still in development, and this session is an opportunity to ensure it reflects country needs and priorities.

This draft curriculum outline was prepared by a steering group made up of representatives from the University of Chicago, the Mohamed bin Zayed University of Artificial Intelligence, the International Institute for Climate and Society at Columbia University, the World Meteorological Organization, the European Centre for Medium-Range Weather Forecasts ECMWF, Google, and other partners who have contributed their time and expertise to this initiative. We deeply thank them for their thoughtful contributions.

We are sharing this draft in advance of the convening so that participants can familiarize themselves with our initial plans for the training program and come prepared to offer feedback.

Participant note

This session is intended primarily for staff from national meteorological and hydrological services (NMHS) and selected technical partners who will be directly involved in the design and delivery of the AI Weather Forecasting Training Program. Please find a list of participants at the bottom of this document.

Ministry of agriculture representatives and other participants will join a parallel session focused on tools and strategies to improve the dissemination of weather information and farmer comprehension.

Background: About the Training Program

The AI for Climate (AICE) initiative at the University of Chicago and the Mohamed bin Zayed University of Artificial Intelligence (MBZUAI) are launching a specialized training program to help countries unlock the potential of AI weather forecasting to better serve farmers.



This 4-day training—scheduled to take place in Abu Dhabi from September 22–28, 2025—will build technical and operational capacity across the weather forecasting and agriculture sectors. During its pilot stage in 2025, the training program will bring together representatives from five countries—Chile, Bangladesh, Nigeria, Ethiopia, and Kenya—, with plans to expand to 25 additional countries by 2027.

The final curriculum will focus on advanced AI forecasting techniques tailored to agricultural decision-making. It includes three interconnected tracks:

- A **technical track** for NMHS staff to learn how to run and evaluate cutting-edge AI models, including how observational data quality affects model performance.
- An **applied track** for agricultural professionals focused on identifying priority use cases and tailoring forecasts to better meet farmers' needs.
- A **joint track** to promote cross-sector collaboration and develop the building blocks needed to integrate AI forecasting into national systems.

Training participants will:

- Strengthen their ability to generate and evaluate AI-based weather forecasts.
- Apply these forecasts to real agricultural use cases to improve outcomes for farmers.
- Identify user requirements and develop effective communication strategies.
- Share current practices and explore improvements for operational use.

Laptops will be provided to all participants upon arrival to ensure access to the tools and environments needed for hands-on learning.

Please note: Participants attending the Nairobi convening are not expected to be the same individuals attending the Abu Dhabi training. Your input at the convening will help shape a program that meets the needs of your institutions and colleagues.

For review: Curriculum Outline

The training will be structured around three interlinked tracks. Each track will be designed for different user groups and skill sets across the forecast value chain.

1. Technical track

Audience: Staff from NMHS.



Focus: Operational use of AI forecasting models, from data preparation to evaluation.

Modules: We propose to include the following modules in the technical track curriculum:

- **Forecast approaches used today:** Introduces traditional (statistical and NWP) and AI-based forecasting approaches, comparing their strengths and uses.
- **Data quality and assimilation:** Emphasizes the importance of observational data (meteorological, agrometeorological, hydrological) and outlines the full data value chain—from collection and transmission to quality control and storage.
- **Install software and run checks:** Guides participants in setting up open-source Al forecasting environments, installing software, and verifying system readiness. Laptops provided will come preloaded with relevant tools.
- **Generating AI-based forecasts:** Hands-on module to execute AI forecast models with real datasets, exploring inputs, configuration, and output generation.
- **Evaluating AI and NWP models:** Covers evaluation techniques and metrics, enabling participants to assess performance and limitations.
- Al downscaling and bias correction: Presents techniques to refine coarse-resolution outputs into locally usable formats, including AI-based downscaling and bias correction.
- 2. Applied track

Audience: Staff from ministries of agriculture or related agencies.

Focus: Understanding and operationalizing forecasts for agricultural decision-making.

Modules: We propose to include the following modules in the applied track curriculum:

- **Review of climate concepts and forecasts:** Establishes a baseline understanding of key forecasting concepts, including lead time, uncertainty, and spatial scale.
- Use of forecasts in agricultural advisory services: Highlights how weather forecasts are used in practice to support decisions such as sowing, irrigation, pest control, and input planning.
- **Identifying user needs for forecasts:** Participatory exercise to map decision points in agriculture and determine what forecast information is most valuable and when.¹

¹ Note that this exercise will begin at the Convening in Nairobi, offering a starting point for the training module.



- **Communication pathways for forecasts:** Reviews a range of delivery mechanisms (e.g., SMS, IVR, mobile apps, extension visits) and assesses which are most effective in various contexts.
- **Tailoring forecasts for farmer decision-making:** Teaches how to interpret and adapt forecast content for practical field-level guidance, considering both technical accuracy and user comprehension.
- 3. Joint track

Audience: Teams from meteorological and agricultural institutions.

Focus: Supporting institutional integration of AI forecasting capabilities.

Modules: We propose to include the following modules in the joint track curriculum:

- **Forecast applications for agriculture:** Explores use cases where weather forecasts can improve agricultural decisions. Draws on examples from multiple regions.
- What is technically possible today? Provides an overview of the current frontier in Al forecasting across different lead times and variables, highlighting what is practically achievable.
- Using national roadmaps as reference. This session will build on national roadmaps co-created during the Convening in Nairobi to explore how training outcomes can support national goals.
- **Cross-country framework design.** Facilitates discussion on shared gaps, coordination opportunities, and common standards across countries participating in AIM for Scale.
- **CONOPS: Concept of Operations for Implementation.** Outlines how AI forecasts can be integrated into institutional workflows from generation to dissemination. Participants will examine and refine sample concepts of operation.

For review: Pre-Training Materials

We are currently planning to offer introductory videos and pre-recorded sessions ahead of the September training. However, we would greatly value your input during the convening on:

- What formats would be most useful (e.g., videos, readings, webinars)?
- What topics should be prioritized for pre-training?



• What level of technical familiarity should we assume?

We are also considering a short pre-assessment to help tailor learning levels.

Preparing for Workshop 2.1

In this convening session, participants will work in small groups to:

- Review and validate each proposed module
- Provide feedback on content relevance and structure
- Recommend adjustments to better fit institutional needs
- Suggest delivery formats (hands-on, tutorial, discussion, etc.)
- Identify gaps or additional content
- Share views on pre-training and participation expectations

Your insights will directly influence how we finalize and implement the training program.

Participants Workshop 2.1

Lead: Tufa Dinku

- 1. Asaminew Teshome, Ethiopian Meteorological Institute (EMI)
- 2. Erkin Isaev, World Meteorological Organization (WMO)
- 3. Genevieve Flaspohler, Rhiza Research
- 4. Hosni Ghedira, Mohamed Bin Zayed University of Artificial Intelligence (MBZUAI)
- 5. Japeth Migiro, Kenya Meteorological Department (KMD)
- 6. Katie Kowal, University of Chicago
- 7. María Carolina Vidal, Chilean Meteorological Service (DMC)
- 8. Oliver Kipkogei, IGAD Climate Prediction and Applications Centre (ICPAC)
- 9. Olivia Graham, Google
- 10. Oluwaseun Wilfred Idowu, National Weather Service of Nigeria (NiMet)



- 11. Ousmane Ndiaye, African Center of Meteorological Application for Development (ACMAD)
- 12. Pedram Hassanzadeh, University of Chicago
- 13. Peter Odjugo, National Weather Service of Nigeria (NiMet)
- 14. Rabia Merrouchi, World Meteorological Organization (WMO)
- 15. Shameem Hassan Bhuiyan, Bangladesh Meteorological Department (BMD)
- 16. Stanley Best, Institute of Agricultural Research of Chile
- 17. Wenjian Zhang, National Center of Meteorology of the United Arab Emirates
- 18. William Becker, European Centre for Medium-Range Weather Forecasts (ECMWF)
- 19. William Boos, University of California, Berkeley