

Terms of Reference: AI Weather Forecasting Specialist for Senegal and Nigeria

AIM for Scale is supporting governments and national meteorological services to operationalize recent advances in artificial intelligence and machine learning (AI/ML) for weather forecasting, with a focus on applications relevant to agriculture.

In Senegal and Nigeria, AIM for Scale is working with national and regional partners to strengthen the use of AI-based weather forecasting within existing meteorological systems and improve links between forecast production and agricultural decision-making. The work will be undertaken in close collaboration with the African Centre of Meteorological Applications for Development (ACMAD), the Agence Nationale de l'Aviation Civile et de la Météorologie (ANACIM) in Senegal, and the Nigerian Meteorological Agency (NiMet).

The University of Notre Dame, which hosts the AIM for Scale Secretariat, is looking to contract an individual consultant to provide technical support for this work. The consultant will work closely with ANACIM and NiMet to benchmark AI weather models, strengthen forecast validation processes, support integration into operational workflows, and identify practical applications for agricultural services.

Activities

The consultant will carry out the following activities:

1. Assess observational data available for forecast validation in each country. This will include comparing publicly available observational datasets with national ground-based station data at timescales and geographic scales relevant to priority agricultural indicators and recommending appropriate reference datasets for benchmarking.
2. Develop an operational benchmarking process to assess the performance of leading AI weather models in Senegal and Nigeria for priority agricultural use cases. The analysis should compare multiple publicly available AI models, relevant conventional numerical weather prediction approaches, and appropriate baseline forecasts to identify strengths, limitations, and gaps.
3. Support testing of approaches to improve forecast performance, where appropriate, including calibration, bias correction, or blending AI model outputs with national observations or existing operational forecasts. Raw model outputs should first be evaluated independently, with any adapted or blended products subsequently assessed against the same benchmarks.
4. Support ANACIM and NiMet in operationalizing AI-based forecasting, including dry runs, internal forecast validation exercises, regular forecast validation meetings, and integration of AI forecast outputs and benchmarking procedures into existing workflows.

5. Present and socialize results with diverse stakeholders in each country, including meteorological agencies, agriculture ministries, extension services, research institutions, and development partners, and promote linkages for forecast sharing and dissemination through existing advisory channels as appropriate.

Deliverables

The consultant will deliver the following products:

1. Inception report: Proposed methodology, activities, key milestones, and timeline for work in Senegal and Nigeria.
2. Data assessment: Assessment of observational datasets available for forecast validation in both countries, including recommendations on reference datasets for benchmarking.
3. Model evaluation: Results of benchmarking for at least one agriculturally relevant forecast or use case in each country, including documentation of methods, model performance, and adapted benchmarking code.
4. Benchmarking pipelines: Documentation and tools establishing procedures for forecast validation, model comparison and selection, and integration of AI forecasts into ANACIM and NiMet workflows.
5. Operational testing: Support for dry runs and regular forecast validation exercises, including testing of at least one priority agricultural application in Senegal and Nigeria and recommendations for linking improved forecasts with agricultural advisory and dissemination systems.
6. Final report: Summary of activities and results, lessons from operational implementation, remaining technical and institutional constraints, and recommendations for future scaling and investment.

Duration and qualifications

The assignment is expected to run for up to 12 months, based out of Abuja, Nigeria, or Dakar, Senegal. The consultant should have:

- Advanced degree or equivalent professional experience in atmospheric science, climate science, applied mathematics, physics, engineering, machine learning, or a related field;
- Demonstrated experience in weather forecasting, climate modeling, or applied AI/ML;
- Experience developing and validating scientific models and working with large datasets;
- Experience working with national meteorological services or development-focused climate applications.



Budget

Total budget: USD 40,000

- USD 30,000 for a designated AI Fellow
- USD 10,000 for travel

How to Apply

Please send a CV, cover letter, and 3 references to isalas@aimforscale.org.