PEACE, PROSPERITY AND REGIONAL INTEGRATION

IGAD CLIMATE PREDICTIONS AND APPLICATIONS CENTRE - ICPAC

VACANCY ANNOUNCEMENT

Position Title:	**Climate Forecaster (Machine Learning Expert)**
Reference:	**ICPAC – Climate Forecaster (MLE)**
Organizational Unit:	**ICPAC**
Reports to:	**ICPAC- Climate and DRM**
Classification:	**Professional**
Duty station:	**Nairobi, Kenya- ICPAC Office**
Expected start Date:	**April 2023**
Duration:	**12 months, with possibility of extension**

Deadline for Applications: 10 March 2023

1. Introduction and Context

The Intergovernmental Authority on Development (IGAD) is one of the Regional Economic Communities (RECs) of the African Union Commission. IGAD was initially established in 1986 as the Intergovernmental Authority on Drought and Development (IGADD) to coordinate the member states' efforts in combating drought and desertification and promoting efforts to mitigate the effects of drought. It was later revitalized in 1996, expanded its mandate, and renamed Intergovernmental Authority on Development (IGAD). IGAD has various divisions and specialized institutions working to advance development and address the challenges in the region. The IGAD Climate Prediction and Applications Centre (ICPAC) is one of the specialized institutions within IGAD mandated to provide climate services and applications, including disaster risk management.

The IGAD region has been facing recurrent disasters resulting from natural and human-made hazards and due to multiple drivers. Key among the multiple hazards that evolve into disasters are droughts, floods, landslides, epidemics, and pandemics. Human-made hazards include industrial and transportation accidents, environmental pollution, crop and livestock pests, and earthquakes. These hazards have caused disasters of varying magnitudes in the past. Disasters still remain a serious development challenge for the IGAD region, destroying years of development efforts, squandering vast resource investments, perpetuating poverty, damaging infrastructure and the natural environment, impoverishing communities, and diverting national priorities and development resources to emergency management operations. Disasters displace millions of people annually in the IGAD region, perpetuating the cycle of poverty as displaced people lose their assets, homes, and livelihoods and cannot recover before the next disaster. Disasters also put additional strain on the limited resources of national governments. Climate change and environmental degradation contribute to the increase in frequency and intensity of hydro-meteorological hazards. In the faces of increasing and compounding risks, improving climate forecasts will have a critical role for better and informed decisions that will help act in advance and avert/minimize impacts of extreme events.

Strengthening Early Warning Systems for Anticipatory Actions (SEWAA) Project is a multi-year project funded by Google. The project aims to assess the skilfulness and sustainability of developing a cloud-based Machine learning post-processing system for improved high-impact weather forecasts. Skilful early warnings are the most important component of any disaster risk management system. They offer all relevant government sectors the right information at the right time. These reliable forecasts are used to make informed decisions regarding preparedness actions, AAs, and emergency response actions at the right place before, during, and after the impact of a severe weather event. Through improved forecasts, governments can develop AA plans with validated cost-loss scenarios reflected against various risk profiles. Machine learning techniques will be developed for post processing OF ensemble weather forecasts using traditional and non-traditional weather observations.

The IGAD Climate Prediction and Applications Centre (ICPAC) is part of the SEWAA project with the World Food Programme (WFP) as the lead organization and technical partner institutions, namely, ECMWF, University of Oxford, and University of Bristol. The project is funded by Google. ICPAC will be implementing a set of activities

together with project partners that requires the expertise of a **Climate Forecaster (Machine Learning Expert)** to support the improvement of forecast products at ICPAC and improve the way forecast data is used to generate early warning information for early action. S/he will support integration of forecast products into ICPAC operations and systems working together with the Data Officer/ Developer.

2. Tasks and responsibilities

2.1. Contextualise the Machine Learning (ML) model developed with the University of Oxford to the IGAD region, including conducting model training, verification and improvement

2.2. Undertake calibration and downscaling of the global ensemble forecasts using Machine Learning (ML) techniques

2.3. Generate high-resolution calibrated probabilistic weather and climate forecasts using ML post-processing techniques at regional level and verify the validity and uncertainty of forecast products

2.4. In partnership with international centers, develop and propose new methodologies for improved climate forecast and weather forecast verification

2.5. Demonstrate evidence on the benefit of Machine Learning for improving Early Warning Systems and informing anticipatory action

2.6. Lead research on and implementation of Machine Learning techniques to improve weather and climate forecasting

2.7. Perform data assimilation using the data collected from Regional Advanced Retransmission Systems (RARs) station for improved severe weather and climate forecasting

2.8. Provide training and develop staff technical skills in use of Machine Learning for calibrating, downscaling, and generating high resolution weather and climate forecasting at regional level and in IGAD member states

2.9. Support the development of impact-based thresholds and probabilistic forecast triggers using improved forecast products

2.10. Support the development of operational and tailored climate products through the applications of specialized analytical, dynamical and statistical methods at ICPAC

2.11. Contribute to the improvement of existing advanced climate modelling and climate prediction production system

2.12. Develop guidance on the best practices, tools and techniques of applying machine learning concepts in weather and climate forecasting

2.13. Contribute to developing various publications including external awareness raising communication materials and peer reviewed papers on the innovative work done by the project

3. Deliverables at the end of the contract

3.1. Successful implementation of the technical components of the SEWAA Project

3.2. A Machine Learning (ML) model and processes are contextualised for post processing and downscaling ensemble weather and climate forecasts over the IGAD region

3.3. High-resolution and calibrated probabilistic weather and climate forecast products, impact-based thresholds and triggers are available for implementing early warning alerts

3.4. ICPAC staff and national meteorological services in the region have the knowledge and capacity to utilize cloud computing resources and ML to train, calibrate, and downscale a global ensemble forecasts

3.5. Publications and guidance documents

4. Required Qualifications, Experience and Skills

4.1. Educational Qualification

4.1.1. Master's degree in Meteorology or Atmospheric Science, Computer Science, Data Science, or related field. A PhD is an added advantage

4.2. Technical Qualifications

4.2.1. Proficiency in scripting and programming languages preferably Python and R programs

4.2.2. Excellent computing skills including computing knowledge necessary for climate diagnostics, modelling and prediction; good working knowledge of compiled computer languages and model output visualization packages

4.2.3. Experience analyzing big climate data

4.2.4. Experience and understanding of statistical and/or dynamical downscaling techniques and how to apply them in various contexts

4.2.5. Good understanding of ML concepts and methods when to apply them and how to effectively implement them using the available machine learning packages is key

4.2.6. Interest/experience in developing, debugging and applying Machine Learning systems

4.2.7. Experience working a multi-disciplinary and multi-organisational team

4.2.8. Ability to describe findings and the way techniques work to audiences, both technical and non-technical and visualization of the results using various tools.

4.2.9. Ability to communicate effectively orally and in writing

4.2.10. Ability to work with minimum supervision

4. Language requirements:

Fluency in English (both oral and written) is required and French has an added advantage.

5. How to apply

Appropriately qualified applicants are eligible to apply.

Interested candidates should send their applications in PDF accompanied by **cover letter, Curriculum Vitae, academic credentials, copy of passports/ ID cards biometric page and three reference persons including the last employer.**

The application should be sent by E-mail to the following addresses: E-mail address: **recruitment@igad.int** with subject line '**ICPAC – Climate Forecaster (MLE)'**.

Closing date for application will be on **10th March 2023**. Due to the large number of applications we expect to receive; only successful candidates who meet the required experience & qualifications for this position will be contacted. Contact: + 25321354050

IGAD is an equal opportunity employer. Female candidates are highly encouraged to apply.