African researchers say artificial intelligence and other mathematical sciences can bring solutions that are more effective if integrated into long-term strategies and policies for climate resilience on the continent.

Prominent researchers from the African Institute for Mathematical Sciences (AIMS), Rwanda Environment Management Authority (REMA), UN Economic Commission for Africa (UNECA), World Meteorological Organization (WMO), Africa Centre of Meteorological Applications for Development (ACMAD) and the Alliance of Diversity International & CIAT held a workshop this week in Kigali, Rwanda to discuss how climate services in Africa can be improved by scientific research.

As building climate resilience necessitates research to anticipate climate risks and hazards, climate scientists unanimously expect a particular outcome from current efforts to build a critical mass of mathematical scientists to contribute towards improving climate information services for Africa.

The provision of climate information services involves collating, analyzing, packaging-up and distributing climate data on variables such as temperature, rainfall, wind, soil moisture, ocean conditions and extreme weather indicators.

With high-quality data tailored to their needs, according to experts, various stakeholders such as policymakers have the information, they need to make properly informed decisions.

With the continuing knowledge transfer, AIMS alumni have been applying their mathematical skills in many ways to address a number of Africa’s development challenges and to contribute solutions to African industry.

Dr Mouhamadou Bamba Sylla, AIMS-Canada Research Chair in Climate Change Science based in Kigali, told reporters that when considering that the information available in Africa is weather forecasts and seasonal predictions, mathematical solutions such as Artificial Intelligence (AI) can play a role in consolidating knowledge of climate hazards prevention by providing better predictions.

As part of these efforts to promote the deep integration of AI and machine learning, climate researchers are emphasizing the use of large-scale models to predict weather on a hyper-local level, and the socio-economic impacts of weather and climate.

It said that an artificial intelligence-based method may also infill gaps in historical temperature data more effectively than conventional techniques.

During their discussion, participants at the workshop observed that yet Africa has a plethora of research institutions concerned with addressing climate-related risks and resilience, challenges still lie ahead to mobilize more resources for developing Africa driven climate research.

Long-term climatic predictions

Experts describe AI as a disruptive paradigm that has greater potential to assess, predict, and mitigate the risk of climate change with efficient use of data, learning algorithms, and sensing devices.

By developing effective models for weather forecasting and environmental monitoring, this new recommended approach makes climate scientists and other stakeholders better understand the impacts of climate change by interpreting long-term climatic predictions.

The week-long workshop explored the investment required in terms of both delivering a step-change in African climate science and in piloting approaches to integrate climate information into decision-making.

Whereas significant contributions were made to addressing fundamental research gaps in African climate science Dr Sylla stressed the pressing need to use AI to produce high quality climate data as a way to improve understanding of future climate extremes over Africa.

“There is evidence of a lack of financial resources to conduct fundamental research to develop scientific projections for future climate in Africa,” he said.

With a growing interest to understand how the growth of artificial intelligence and machine learning may affect global GHG emissions, AIMS currently brings together some of the continent’s most stalwart researchers to conduct world-class research that advances the understanding of nature using mathematics and its applications.

Addressing climate data gaps

In order to address an issue with the usability of climate information for achieving national and continental development plans, scientists recommend Africa to invest

with innovations in long-term weather and climate forecasts in order to understand how future climate trends are likely to impact various development plans.

Prof. Sam Yala, Centre President at the African Institute for Mathematical Sciences (AIMS) Rwanda pointed out that African policymakers also need embrace results from research to strengthen climate resilience that can support the achievement of socio-economic goals.

While some researchers stress the need to prioritize research on a broader set of climate-change issues in Africa, Prof Yala observed that addressing the climate data gaps in Africa will help the continent take early action for adaptation and disaster risk reduction.

“Better packaging of research results is another imp,ortant factor because useful information can be used all stakeholders and members of the community” he said.

Latest estimates by the Economic Commission for Africa (ECA), show that Africa could expand its economy by a staggering $1.5 trillion dollars, by capturing just 10% of the speedily growing artificial intelligence (AI) market, set to reach $15.7 trillion by 2030.

UNECA officials say the AI has the potential to solve some of the most pressing challenges facing Africa including mainly climate change.

Frank Rutabingwa, Senior Regional Advisor at UNECA and the Coordinator, Weather and Climate Information Services for Africa Programme (WISER) stressed that Africa need to accelerate training for young scientists with skills in climate modelling.

“By embracing machine learning-driven solutions, Africa can unlock new opportunities for climate resilience, but it seems like stakeholders are still working on separate plans.”