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Speed read

- Higher temperatures will reduce water flow by 45 per cent by 2100
- Average rainfall is also set to fall by 20 per cent
- Farming communities and policymakers should take action – including installing aquifers

[ACCRA] Food production and power generation in the Volta River basin, which is home to 24 million people across six West African countries, will be reduced by climate change related rising temperatures, a study reveals.

The study's climate model shows temperatures in the Volta Basin rising by up to 3.6 degrees Celsius over the next century, leading to greater evaporation and a resulting 20 per cent water loss.

The study was presented last month at the 6th Africa Agriculture Science Week (15-20 July) in Accra, Ghana.

Agriculture in the Volta basin — which covers Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali and Togo — accounts for 40 per cent of the region's economic activity. The basin covers 402,000 square kilometres.

The research was carried out by a collaboration of the International Water Management Institute (IWMI), Germany's Potsdam Institute for Climate Impact Research, CGIAR's Research Program on Climate Change, Agriculture and Food Security (CCAFS), and Ghana's Council for Scientific and Industrial Research (CSIR).

The team of researchers — comprising agronomists, climatologists and social scientists — say that water flow in the Volta region could fall by 24 per cent by 2050 and by 45 per cent by 2100. This would deprive the basin of water that countries depend on for driving hydroelectric turbines and farming.

The scientists based their predictions on rainfall and temperature data covering 2009 to 2012.

"By 2050 it is expected that water loss will significantly influence agricultural and energy production from the river," Robert Zougmore, regional programme leader for CCAFS West Africa, tells SciDev.Net.

Responses to the problem could include the provision of underground water to farmers, he adds.

"In addition, it is possible to use up-to-date information regarding climate services, such as seasonal forecasting, which will indicate the likely behaviour of the rainfall season in terms of water availability and variability," Zougmore says. "With this information, farmers can decide what kind of agricultural production to undertake."

Timothy Olalekan Williams, IWMI's Africa director, tells SciDev.Net that water decline in the basin will also affect groundwater recharge — harming farming.

The researchers suggest that policymakers need to start thinking about water storage options, which will require systematic planning and collaboration among the six Volta countries.

Installing aquifers is one solution that has been tested successfully in South Asia, Williams says.

Surface ponds and tanks can be constructed to capture flood waters, and, if properly stored, water can then be used during the dry season.

"There are risks that farmers have learned to respond to over the years — but climate change will bring a different kind of risk that they are probably not used to and therefore need assistance [to adapt] to," says Williams.

Eric Owusu Adjei, scientific secretary at the CSIR-Soil Research Institute, Ghana, says better soil management is also needed to conserve soil moisture. And he also suggests that farmers should select crops that are better adapted to drought or that reach maturity faster.

This article has been produced by SciDev.Net's Sub-Saharan Africa desk.

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