



# CLIMATE CHANGE PROJECTIONS

## THE STATUS AND FUTURE OF CLIMATE PROJECTIONS IN WEST AFRICA

### CONTEXT

Making sound decisions about investments that will help West Africans adapt to climate change requires an understanding of where and when changes in temperature and rainfall are likely to occur. Unfortunately, the West African climate is extremely complex and subject to wide variations within years, between years, and across decades. Moreover, the drivers of weather patterns are likely to interact differently in different parts of the region, making general predictions for the region as a whole almost impossible. However, a large portion of the population of West Africa

depends on agriculture for their livelihood, so developing greater skill in predicting changes in annual and intra-annual rainfall is both economically and socially important. Assessment of the current state of climate science in West Africa can help identify gaps and weaknesses that can affect the accuracy of projections.

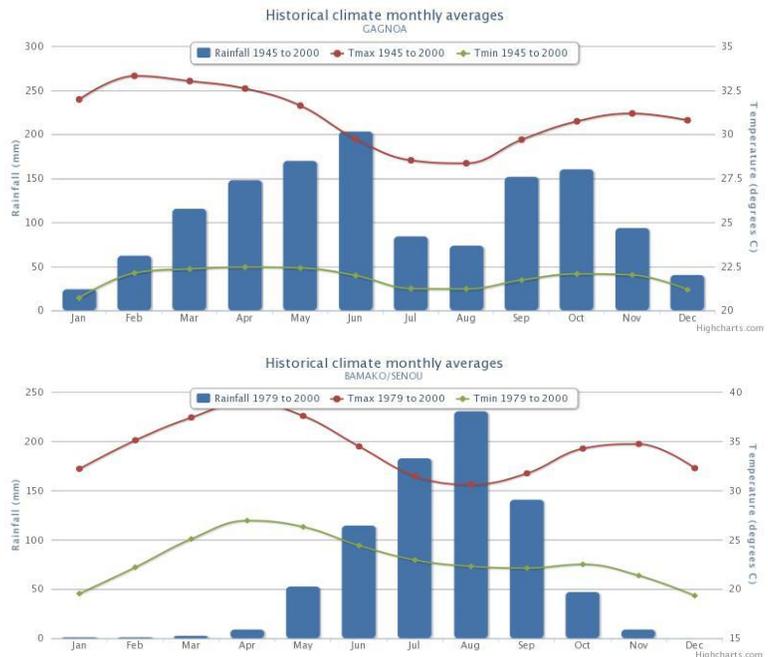
### FINDINGS

The process of producing projections of changes in weather and climate patterns that decision makers can trust depends on three main sources of information: observational data, remote sensing data, and computer modeling.

#### Observational data

A detailed understanding of the West African climate is hindered by a lack of

### MEAN MONTHLY PRECIPITATION AND TEMPERATURE



Figures showing the mean monthly rainfall (blue bars), mean monthly minimum and maximum temperature (green and red line, respectively) from the station in Gagnoa in the Ivory Coast (top) and Bamako in Mali (bottom). Source: Created Using The Climate Information Platform (CIP) developed by CSAG.

long-term, continuous sequences of observed climate data. Existing data, collected by observation stations scattered thinly over the region, tend to be fragmented and of low quality.

### Remote sensing

While space-based observations have helped fill gaps in ground-based observations, these data only capture proximate measurements and need to be calibrated and verified using ground observations. Satellite data can also contain biases that may distort or conceal important changes.

### Computer modeling

Climate modeling uses observations and our understanding of the physical processes that drive climate and weather patterns to project future climate. However, the complex interactions among the factors that drive climate patterns in West Africa are not well understood. Existing global models most successfully portray changes in the Northern Hemisphere; descriptions of the future climate in West Africa contain greater margins of uncertainty. The science of climate modeling will continue to advance, and knowledge about the drivers of climate change in West Africa will improve, but for the foreseeable future, climate modeling will continue to produce a wide array of possible future scenarios. The resulting uncertainty can be a source of confusion for decision makers. To ensure effective decision making, communications about climate modeling information needs to bridge the gulf of understanding between scientists and decision makers.

## RECOMMENDATIONS

The observation network in West Africa needs to be improved and further developed. This is a long-term investment that needs to be sustained continuously to provide the necessary data record.

The many unknowns about West African climate dynamics are the subject of ongoing research that needs to be sustained. Focused research, combined with intensive observations, has a proven record and will play a large role in reducing uncertainties and improving our understanding of future climate developments. However, efforts to improve models in equatorial and tropical regions have been limited, so more attention to the West African region is necessary to improve our understanding of regional climate processes.

Given the current uncertainty of climate projections and the likelihood that some of this uncertainty will persist for the foreseeable future, planning and decision making must be appropriate for a number of future scenarios. The process of transferring information from scientists to decision makers could be aided by tools that could help decision makers ask the appropriate questions and enable climate scientists to provide useful and easily understood answers.

Evidence is growing that an approach that combines cross-sectoral co-exploration of climate projections, analysis of major climatic events and their drivers, and exploration of multiple possible future climate scenarios will improve decision making and inform policies to reduce vulnerability to a changing climate.

## ADDITIONAL INFORMATION

This brief highlights key conclusions from Blamey, R., Coop, L., Jack, C., Loveday, B., and Sutherland, K. (2013). *Background Paper on the Status and Possible Evolution of Climate Projections in West Africa*. USAID. Interested readers are invited to review the full paper at <http://community.eldis.org/ARCC/>.