



## **Outline of the project: AMMA-2050**

African Monsoon Multi-disciplinary Analysis-2050

### Background:

The amount and timing of rainfall in West Africa is critical to many sectors of the region's economy, and directly affects the livelihoods of its growing population. In this region rainfall is notoriously variable, and is strongly affected by conditions both locally (e.g. vegetation), and globally (ocean temperatures, air pollution). In recent years, these factors combined to produce the most extensive and long-lived drought in the global record. The future holds considerable uncertainty about how rising greenhouse gas concentrations and air pollution will affect West African rainfall, and this uncertainty places risks on future investments in areas such as urban infrastructure and agriculture.

AMMA-2050 builds on the largest multidisciplinary research effort ever undertaken in the area of African climate and environment, the African Monsoon Multidisciplinary Analysis, to address the challenges of understanding how the monsoon will change in future decades, and how this information can be most effectively used to support climate-compatible development in the region.

### Objectives of AMMA-2050:

AMMA-2050 comprises a multi-stakeholder, multi-disciplinary and cross-sectoral approach to better inform medium term decision making. Ensuring these decisions are "climate-proofed" now will increase the resilience of West Africa populations to future climate change. The project combines scientific excellence with a process to co-produce relevant climate products employing a range of innovative methodologies designed to strengthen capacities of both partnering scientists and stakeholders. Our objective is to use climate information to support and inform decision-making on the 5-40 year timescale.

The project brings together a broad range of expertise to better understand how West African climate will change, and crucially, to translate this knowledge for decision-makers, explicitly accounting for uncertainty. We will focus on weather events that significantly impact on livelihoods (e.g. flood-producing storms, crop-damaging dry spells), and combine traditional computer models of climate change with observations and cutting edge regional models which realistically depict individual storms. By applying expert judgement to these outputs, we will identify impacts and adaptation options in water resources and agriculture, including targeted studies on urban flooding (city of Ouagadougou) and crop breeding (in Senegal).

We will translate regional climate projections, accounting for physical uncertainty and socio-economic context, into regional projections for water resources and agriculture. Decision



makers will be integrated from the outset, using a format whereby decision makers will have an essential role in framing uncertainty descriptions – assisting users to take ownership of the research and simultaneously building capacity that addresses understanding as amongst the primary barriers to Climate Information Services uptake.

### Opportunities

West Africa has a history of prolonged and severe droughts, most notably in its semi-arid Sahelian region. With respect to future climate, a lack of understanding and consensus hinders decision-makers in West Africa. Quantification of future climate changes and of the associated uncertainties in seasonal rainfall, High Impact Weather and their impacts allows risk-based information to feed into pathways approaches. By involving scientists, decision makers and other stakeholders, we aim to promote the co-production and ownership of decisions sensitive to climate variability and change.

Our two pilot studies, focusing on flooding in the City of Ouagadougou and on Climate-Smart agriculture intensification and adaptation in Senegal, provide in-depth examples of the benefits that can arise from access to excellent and relevant research for decision makers.

### **Consortium Members:**

Centre for Ecology and Hydrology, UK (coordinator); University of Sussex, UK; University of Leeds, UK; UK Met Office; International Institute for Water and Environmental Engineering, Burkina Faso; University Cheikh Anta Diop of Dakar(UCAD), Senegal; University of Cape Coast, Ghana; National Agency for Civil Aviation and Meteorology (ANACIM), Senegal; Senegalese Institute for Agricultural Research (ISRA); Félix Houphouët-Boigny University (UFHB), Côte d'Ivoire; Pierre Simon Laplace Institute (IPSL), France; CNRM-GAME (CNRS and Météo-France), France; Institut de Recherche pour le Développement (IRD), France; Agricultural Research Centre for Development (CIRAD), France.



### **Programme funders:**

Future Climate for Africa (FCFA) is supporting five major research projects to develop better climate information for Africa and to test how the new information could be used in decision-making. FCFA is a joint programme of the UK's Department for International Development (DFID) and Natural Environment Research Council. For further information on the programme please visit the website:

[www.futureclimateafrica.org](http://www.futureclimateafrica.org)