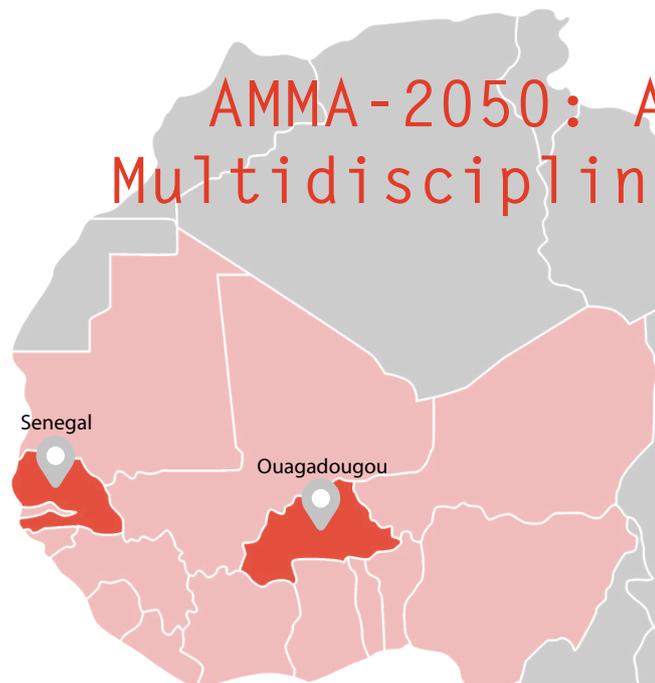


## AMMA-2050: African Monsoon Multidisciplinary Analysis-2050



### About AMMA-2050

[AMMA-2050: African Monsoon Multidisciplinary Analysis-2050](#) aimed to increase understanding of the regional climate of West Africa and how it will change, applying this knowledge to practical development questions. AMMA-2050 has improved understanding of how the West African monsoon will be affected by climate change in the coming decades (focused on the period up to 2050) and helped West African societies prepare and adapt. Bringing together expertise from across institutions in West Africa and Europe, the project has been working with policymakers in West Africa to identify effective adaptation options, particularly focusing on agriculture and water resource management across the region.

AMMA-2050 conducted pilot studies focused on urban flooding in [Ouagadougou](#) (Burkina Faso) and climate-resilient agriculture in [Senegal](#), both issues of significant [societal concern](#). AMMA-2050 has also sought to tailor and share key messages with different groups of decision-makers across the region, as well as sharing the participatory approaches employed within the project amongst partnering research institutions.

### About FCFA

[Future Climate for Africa](#) (FCFA) is generating fundamentally new climate science focused on Africa, and ensuring that this science has an impact on human development across the continent.

FCFA consists of five research consortia who are undertaking research to significantly improve the understanding of climate variability and change across Africa and contributing to improved medium to long-term (5-40 year) decision-making, policies, planning and investment by African stakeholders and donors.



AMMA-2050 Annual General Meeting 2019. Credit CCKE

## Why it's important to understand climate variability and change over West Africa

Lives and livelihoods in West Africa face significant climate-related risks. West Africa, in recent decades, has experienced extreme rainfall variability leading to devastating droughts and floods. The impact climate change will have on climate variability and livelihoods across West Africa remains uncertain. This uncertainty, combined with constrained resources and capacities to invest in planning on decadal timescales, results in development decision-making not being appropriately informed by emerging understanding of climate-related risks.

The impacts of climate change in the coming decades are thus expected to have significant implications for the lives and livelihoods of people in West Africa, and most particularly across marginalised groups. AMMA-2050 has sought to further understanding of future climate variability and change, focusing on areas vital to inform future planning.

## AMMA-2050's approach to integrating climate information into decision-making

- Assess how the climate over West Africa is likely to change in future decades through employing cutting-edge convection-permitting models alongside traditional climate change models supported with observations.
- Combine scientific advances with co-production processes using an 'assess-risk-of-policy' approach to integrate decision-makers from outset, framing uncertainty descriptions to stimulate user ownership of research.
- Improve both the [scientific](#) and [stakeholder engagement](#) capacities of African researchers to produce locally relevant climate science.
- Employing [Participatory Impact Pathways Analysis](#) (PIPA) to bring stakeholders and decision-makers together to co-explore solutions, employing network mapping to identify existing and additional links required to achieve agreed outcomes.
- Co-exploring Adaptive pathways through interactive modelling of [flooding in Ouagadougou](#), and combining the Plateau Game and participatory and [bio-economic modelling](#) of farming systems in

the Peanut Basin of Senegal.

- Employing a range of [participatory approaches](#), including PIPA, participatory modelling and Theatre Forum, to highlight the need for climate adaptation to be developed through inclusive dialogue amongst all key actors.

## How AMMA-2050 went about strengthening adaptation in West Africa

AMMA-2050's work on supporting adaptation in West Africa was carried out through the following activities:

### 1. Enhancing scientific knowledge and prediction of West African climate and the impacts of future climate scenarios

- Examining recent changes in frequency and intensity of [rainfall extremes and dry spells](#), and the [drivers of these extreme events](#).
- Using [historical observations](#) to understand how climate change influences storm intensity in the Sahel.
- Predicting changes in temperature and precipitation [extremes under 1.5°C and 2°C global warming](#).
- Examining the influence of [land-use changes](#) in combination with changes in precipitation.
- Assessing the impacts of climate and other drivers on flooding in [Ouagadougou](#) and [ecosystems and crops in Senegal](#).
- Investigating the coastal consequences of projected regional-scale, long-term changes for the Southern Canary Upwelling System (SCUS) as part of the SCUS-2050 Innovation Fund project lead by Université Cheikh Anta DIOP de Dakar - Ecole Supérieure Polytechnique (UCAD.)

### 2. Enhancing understanding of current and future flood risks in Ouagadougou to inform infrastructural investments and urban planning

- Developing a database and analysing [historical trends of climate and flooding](#).
- Using socio-economic surveys to understand and identify the [climate-related risks](#) faced by people living in flood-prone areas.
- Developing **unique modelling chain methodologies** to meet decision-maker needs by combining regional climate projections capable of representing intense storms, with land-use change projections, to inform detailed flood modelling.

- Developing [Intensity-Duration-Frequency \(IDF\) Curves](#) to inform infrastructural planning in the city.
  - Actively **engaging with [key national and city decision-makers](#)**, seeking to inform infrastructural investments and future planning, sharing and building capacities to appropriately use AMMA-2050 outputs and decision support tools.
  - Undertaking research on the **impacts of climate change on urban water, sanitation and hygiene (WASH)**.
3. **Co-producing climate information for climate-resilient agriculture in Senegal**
- A series of interactions with the Fatick Comité Régionale du Changement Climatique (COMRECC), mayors, members of the national assembly and national decision-makers from across a range of ministries.
  - Engaging farmers and farmer networks through **the [Plateau Game](#)** to; share emerging understanding about climate-related risks, identify ongoing and potential adaptation options, debate policy, and inform and validate modelling results.
  - Supporting **Participatory Modelling** to allow decision-makers and agricultural professionals to review and input knowledge into the project's [bio-economic modelling](#).
- Developing a **[Theatre Forum](#)** play to support dialogue between researchers, national and sub-state policymakers, and farmers and farmer networks, taking this on a '[road show](#)' in Dakar and two other regions.
  - Developing an online climate adaptation portal ([Geo-Portal](#)) to support decision makers in the agricultural sector of Senegal.
4. **Improving the capacities of partnering African scientists to develop climate information that can effectively support development decision-making**
- Producing high quality climate science to inform agricultural development in Senegal and urban planning in Ouagadougou.
  - **Strengthening the technical capacities of West African researchers to deliver [climate metrics](#)** essential to climate-resilient development,
  - Improving the [stakeholder engagement capacities](#) of partnering researchers to co-produce decision-relevant climate information.
  - **Conducted [joint forums](#)** with the [BRACED Zaman Lebidi](#) project and [WASCAL](#) (West African Science Service Centre on Climate Change and Adapted Land Use).

## Taking AMMA-2050's legacy forward:

The activities below were identified as key to the success and legacy of AMMA-2050 and received further funding until March 2021 to extend sharing of project learning and tools and strengthen understanding of how climate change can better support climate-resilient planning in West Africa:

- 1. Develop training to strengthen decision-makers' understanding of AMMA-2050 key findings and tools and how these can support development-planning**
  - Continue training non-technical decision-makers and technical advisors in various sectors on key project learning and tools.
  - In Senegal, training for sub-state and national decision-makers and advisors on use of the GeoPortal, that houses key AMMA-2050 findings.
  - In Burkina Faso, training for City-level and national decision-makers and advisors on the project's key findings related to future climate change and how flood maps and IDF curves can inform urban planning.
- 2. Undertake training for researchers to produce outputs according to the methodologies that AMMA-2050 has developed**
  - Provide additional training for AMMA-2050 researchers and cross-regional training for national met agencies across 4 countries in West Africa to meet decision-makers' climate information needs.
  - Embedding gender and inclusion awareness by working with ISRA to develop a training module on gender and inclusivity integrated alongside training on the Geo-portal.
- 3. Co-develop tools quantifying future projections of extreme rainfall which encapsulate new understanding of Sahelian storms**
  - Development of future IDF curves to describe changing rainfall patterns for engineers.
- 4. Further develop and provide latest climate and impacts data for inclusion on the GeoPortal**
  - Building on the success of this tool by incorporating the new CMIP6 data into the portal.
  - Increase use of the portal through training and communication.

# Partner Organisations

[Institut International d'Ingénierie de l'Eau et de l'Environnement](#)  
(Burkina Faso)

[l'Agence Nationale de l'Aviation Civile et de la Météorologie](#)  
(Senegal)

[UK Centre for Ecology and Hydrology](#) (UK)

[Centre de coopération internationale en recherche agronomique pour le développement](#) (France)

[National Centre for Meteorological Research - the Meteorological Atmosphere Study Group](#) (France)

[Institut Pierre Simon Laplace - Oceanic and Climate Laboratory](#)  
(France)

[Institute of Environmental Geosciences / National Research Institute for Sustainable Development](#) (France)

[IRD-DIADE: Institute de recherche pour le developpement- Diversité - Adaptation - Développement des plantes](#) (France)

[Senegalese Institute for Agricultural Research](#) (Senegal)

[VNG Consulting Ltd](#) (UK)

[Met Office](#) (UK)

[National Agency for Civil Aviation and Meteorology](#) (Senegal)

[University of Cape Coast](#) (Ghana)

[University of Leeds](#) (UK)

[University of Sussex](#) (UK)

[Université Cheikh Anta DIOP de Dakar - Ecole Supérieure Polytechnique](#) (Senegal)

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AMMA-2050 team photo at the AMMA-2050 Annual General Meeting 2019. Credit CCKE

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