

# CLIMATE RESEARCH FOR DEVELOPMENT IN AFRICA (CR4D)

## *Using climate science to drive Africa's development*

The Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC) – the body widely recognized as the international authority on climate change – give clear evidence of increased warming across Africa. The reports put forward a powerful case that increases in global temperatures are the result of human-induced climate change. Unless appropriate adaptation action is taken to reduce the impacts of climate change and variability – evident in rising temperatures, erratic rainfall and extreme weather events such as floods, droughts and heat waves – Africa stands to lose hard-fought economic and development advances seen over the last decade.

Adapting to the changing climate requires not only understanding past and future climate risks but also factoring climate research findings into development policy, planning and practice within climate sensitive socio-economic sectors such as food and agriculture, disaster risk reduction, energy, natural resources management (e.g. water, forests and land) and health as well as sectors dealing with migration, gender, urbanization, infrastructure, marine and coastal zones, etc.

Limited understanding of the African climate system impedes our collective ability to deliver adequate early warnings and climate predictions. This restricts the use of climate information by African decision-makers and communities most vulnerable to current and future impacts of a changing climate. Tackling these significant climate knowledge gaps across Africa requires targeted and sustained capacity development interventions in climate science research, applications and policy. Such interventions support accurate, timely, reliable and spatially-relevant information to guide appropriate climate change actions in Africa.

Climate research outputs must, however, be developed and communicated in a way that is relevant and usable for decision-makers and vulnerable communities on the continent. Moreover, outputs should be demand-driven and responsive to user needs if they are to be effectively incorporated into sustainable development policy and planning.

The Climate Research for Development in Africa initiative (CR4D) maximizes opportunities presented by climate change and variability while addressing challenges posed to Africa's socio-economic development efforts.

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## So, why CR4D?

CR4D's overriding mission is to create an enabling environment for effective decision maker-scientist collaborations to co-explore<sup>1</sup>, co-design<sup>2</sup>, co-produce<sup>3</sup> and co-communicate<sup>4</sup> climate information and services. This mission has been designed to meet the needs of many stakeholders including local, municipal, national and regional agencies. Armed with timely, relevant and accurate information – grounded in scientifically-robust and evidence-based research – these groups can make decisions and take actions that will positively influence people whose livelihoods are threatened by hydroclimatic risks and hazards.

All too often, information generated by climate scientists is not delivered in a user-friendly way, making it difficult for use in practical decision making to inform action on the ground. This has become frustrating for scientists, producers of climate information and users of information alike. How is CR4D addressing this dilemma?

*“CR4D aims to put relevant climate science knowledge into the hands of users and, at the same time, improve science research outputs”*

CR4D promotes user-driven, co-generated applied climate research that explores avenues and best practices to address the gap between climate science, services and policy. The initiative facilitates and strengthens interactions between scientists and decision makers, thereby improving the quality, access, and usability of climate information, knowledge and services for different socio-economic sectors.

In a nutshell, CR4D builds a bridge between African decision makers and climate science researchers, and supports the production of actionable climate research outputs that will inform adaptation decisions in Africa by mid to end 21st Century.

*“CR4D seeks to promote and facilitate integration of the African climate research community (scientists and institutions) with end-user climate information”*

To support the Africa climate research community (scientists and institutions) in generating end-user climate information, the CR4D Secretariat has launched several activities using seed-money from the African Climate Policy Center (ACPC) as well as the UK's Department for International Development (DFID) under the Weather and Climate Information Service

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<sup>1</sup> Co-explore: end-users identify their most pressing climate-related challenges and pinpoint the biggest knowledge gaps

<sup>2</sup> Co-design: Priority areas that have been explored and identified by the end-users are integrated into the design of the climate research. This ensures the users remains front and centre when the research concept is being developed.

<sup>3</sup> Co-produce: XXXXX

<sup>4</sup> Co-communicate: Each end-user has different priorities and will apply the research findings differently. Outputs need to be tailored and packaged up accordingly, translated into applications and disseminated via different platform.

(WISER) project.

These activities include:

### **1) Building a multidisciplinary network to address user-driven research challenges (CR4D-IRP)**

The CR4D Institutional Collaboration Platform (CR4D-ICP) promotes user-driven participatory climate research by facilitating and strengthening a network of institutions and stakeholders to co-design, co-produce, and co-communicate demand-driven climate information and services. Central to CR4D-ICP's approach is bringing climate science, services and policy-making into once collaborative and interactive space. CR4D-ICP coordinates this multi-disciplinary network, aimed at capturing the expertise of both individuals and institutions while ensuring that the network is regionally balanced. The platform is gender diverse and is represented by regional research centers, WMO Regional Climate Centers (RCCs), Regional Economic Communities (RECs), development agencies, NGOs, civil society, youth climate initiatives and other key stakeholders in the climate enterprise. The platform in its inception workshop draws on representatives from across 24 institutions.

Working together, these groups collectively address user-driven research challenges while exploring opportunities presented by climate change and variability for Africa's socio-economic development.

Improved access, quality, usability, dissemination of climate information– and mainstreaming this information into socio-economic planning – is critical in helping Africa meet its commitments under the Paris Agreement, Agenda 2063, and the Sustainable Development Goals.

*“The CR4D-ICP, launched in December 2017 in Addis Ababa, Ethiopia, is a multi-disciplinary platform represented by regional research centers, WMO Regional Climate Centers (RCCs), Regional Economic Communities (RECs), development agencies, NGOs, civil society, youth climate initiatives and other key stakeholders in the climate enterprise. The platform draws on representatives from across 24 institutions”*

### **2) Mapping climate research experts and institutions**

A truly collaborative and effective climate research platform comprises diverse expertise from the natural, biophysical and social sciences to design and execute research that can later be translated into appropriate and actionable information for policy and sustainable development planning.

Physically mapping out experts and institutions working in climate research supports co-designing, co-producing, and co-resourcing multi-institutional and multi-stakeholder research in Africa. Mapping also provides a vehicle for pooling and sharing research facilities, resources, and infrastructure among sub-regional, regional and Pan-African

institutions. It can pinpoint which institutions have the capacity to produce relevant products and can provide policy makers and other stakeholders with relevant information about past and ongoing climate change research. The CR4D Secretariat has, therefore, conducted a mapping exercise to provide information on Africa- wide climate research and related institutions, initiatives and experts that have been active in climate change research over the past 10 years. The data collected are processed, uploaded and stored in Google Maps on the CR4D website to provide web-based spatial geo-information about the geographical locations of institutions, initiatives and experts in Africa and beyond.

### 3) **Scoping user-driven climate research priorities**

CR4D held two regional climate research partnership (RCRP) workshops “Going beyond the talk!” with the primary objective of scoping and assessing user-driven climate research priorities for Eastern and Southern Africa. This scoping exercise was designed to facilitate the formation of multi-disciplinary participatory climate research and outreach teams, jointly focused on identifying, co-designing and undertaking priority user-inspired climate research that can improve quality and access to climate information and services for policy making and development planning.

In each sub-region, over 50 participants were drawn from different institutions including the RECs, RCCs, meteorological services, and others. The workshops also saw the forming of the interim CR4D regional research coordination team. Alongside workshop participants, the team developed potential pilot project proposals on the impacts of climate on the food-energy-water nexus. Participants also agreed that the CR4D regional coordination teams should work more closely with marine and oceanographic experts to develop integrated user-driven research that incorporates the effects of changes in sea surface temperatures and ocean heat content, and how they affect sub-seasonal, seasonal and longer-term forecasting e.g. the influence of El Nino.

Participants called for the CR4D secretariat to support the mobilization of seed funding to initiate a proof-of-concept pilot to ensure operationalization of the respective RCRP coordination teams. Furthermore, they recommended that the CR4D secretariat identifies key challenges, information/knowledge gaps and user-driven research priorities for the region while conducting comprehensive research on climate change that takes advantage of ongoing initiatives (e.g. the impact of 2-degree global warming on Africa).

*“Going beyond the talk!” were the first CR4D Regional Climate Research Partnership (RCRP) workshops for East and Southern Africa. The workshops promoted co-resourcing, and co-producing user-driven climate information and services”*

### 4) **Generating sub seasonal-to-seasonal (S2S) predictions**

Africa’s agricultural sector has the potential not only to feed its burgeoning

population but to drive a thriving export market - and in doing so, boost the continent's economic growth and bolster development. However, irregular and unpredictable seasonal rainfall patterns disrupt agricultural productivity. Short-range weather predictions (1-14 days) provide detailed weather information, but this timescale is too short for agricultural planning. The timeframe for seasonal predictions (>3 months) is useful – but the information in these predictions is not detailed enough for local agriculture planning. This needs forecasts that work to the appropriate time scale and provide detailed information.

S2S predictions (15-90 days) can fill the gap between the timescales of short-range weather predictions and seasonal predictions. These forecasts can give information, for example, on the onset and cessation of rains. With precise information on when rains are expected, a farmer may adjust the sowing dates for crops, or shift to fast-maturing alternatives, depending on how the length of the growing season will be impacted. S2S forecasts can also provide early warning of high-impact events such as floods, droughts, heat and cold waves. To this end, two pilot projects have been deployed to develop prototype climate forecasts at S2S scales in West and Central Africa, conducted with the aim of building active partnerships between users, academia, National meteorological and hydrological services (NMHSs) and regional institutions. These build an understanding of user needs and provide a roadmap for developing products. It is envisaged that products will support regional, national and sub-national planning, including through the national/regional climate outlook fora.

In due course, these pilots could contribute to other outputs including promoting the effective use and co-production of CIS. CR4D has launched regional projects to integrate climate research into processes for generating S2S forecasts for the agricultural sector in Western and Central Africa regions.

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## Looking ahead

**1. CR4D's 5-year Strategic Programme (2018-2022)** sets out direction and priorities to catalyse pan-African multi-disciplinary climate research that is responsive to specific users as well as development planning needs at local, national and regional levels. The strategic programme identified major thematic areas for the next five years:

- a) *Foundational climate science*: focusing on improved understanding of the underpinning drivers and dynamics of climate variability and change in Africa; improving forecast and climate prediction skills; developing robust climate change

projections for Africa at multiple scale; and better prediction and attribution of extremes of climate and impacts.

- b) Impacts, information, translation, communication: focusing on enhanced added-value in S2S predictions; enhanced understanding and communication of climate impacts across five priority GFCS areas (agriculture, water, health, DRR, and energy), as well as migration, urbanization, marine and coastal zones, etc.; improved metrics and analytics for evaluation and validation of skills and uncertainties in forecasting and projecting future climate and impacts, including understanding communication theory, barriers and opportunities.
- c) Engagement with policy, development and decision communities: focusing on improved assessment of the uptake, application and user value of climate and impact information by stakeholders and enhanced capacity for co-production including trans disciplinary research.

*“CR4D’s 5-year Strategic Programme (2018-2022) identifies three research thematic areas under foundational climate science, climate impacts and policy to catalyse pan-African multi-disciplinary climate research”*

## **2. Grant Management Framework (GMF)**

ACPC and DFID jointly developed the principles for the WISER-funded CR4D grant managing institution: (i) to be African-owned and African-based institutions with strong experience in working within the African climate science and climate policy communities; (ii) operates transparent, high-quality, independent research commissioning, grant administration, and management systems; (iii) runs a research programme with longevity and scalability to ensure that their research programmes are long lasting and attract funding from additional donors in the long-run; and (iv) conducts open competition and full transparency in decision making to ensure that the review and selection of projects meet technical and operational standards. The GMF has a Grants’ Review sub-committee, which is constituted on an ad-hoc basis to review CR4D grant/project proposals. The CR4D secretariat and Scientific Advisory Committee (SAC) co-chairs lead the process. Establishing the research grant management mechanism is one of the overarching goals of CR4D, to enhance the co-designing of multi-disciplinary climate research for development planning.

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### **About CR4D**

The Climate Research for Development (CR4D) in Africa initiative is the outcome of the resolutions and recommendations reached at the Africa Climate Conference 2013 (ACC2013), held on 15-18 October 2013 in Arusha, Tanzania, and seeks to socialize climate science through an interactive and collaborative approach that brings climate science, services and policy-making under a coordinated multi-disciplinary network of expertise and institutions to collectively address the challenges while maximizing on the opportunities presented by climate change and variability to socio-economic Development in Africa. The founding partners (ACPC/ClimDev-Africa, AMCOMET, WMO, and GFCS) and cross-section of the African climate community and stakeholders officially endorsed it during the third AMCOMET general meeting in Cape Verde, February 2015. The CR4D governance structure includes an Oversight Board, Scientific Advisory Committee and an Institutional Collaboration Platform. These entities are supported by the CR4D secretariat, which is hosted by the Africa Climate Policy Centre (ACPC) since June 2015.

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