



**Bridging Climate Information Gaps to Strengthen Capacities
for Climate Informed Decision-making in Africa**

**African Technology Policy Studies Network (ATPS)
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Bridging Climate Information Gaps to Strengthen Capacities for Climate Informed Decision-making in Africa

Case Studies from: Cameroon, Kenya, Malawi,
Nigeria and Tunisia

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African Technology Policy Studies Network



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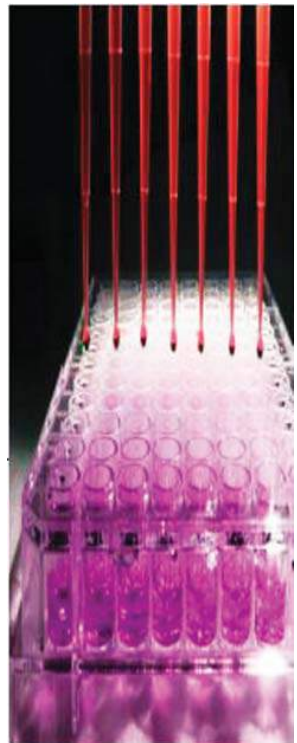


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About the Project

The African Development Bank (AfDB) through its Clim-Dev Special Fund (CDSF), has supported the African Technology Policy Studies Network (ATPS) in partnership with the Stockholm Environment Institute (SEI) Africa Centre, IGAD Climate Prediction and Applications Center (ICPAC), Observatoire du Sahara et du Sahel (OSS), AGRHYMET Regional Centre (ARC), and the Regional Centre for Mapping Resource for Development (RCMRD) to implement a project tagged ***“Bridging Climate Information Gaps to Strengthen Capacities for Climate Informed Decision-making in Africa”***. The goal of this project is to reduce vulnerability and foster a food-secure Africa by strengthening the capacities of African countries to understand and deploy appropriate climate information and best practices to inform decision-making and support development planning. The project focuses on five African countries namely: Cameroon, Kenya, Malawi, Nigeria and Tunisia.

The selection of each country within a region is also based on factors such as being a regional hub; the country that is favourably disposed to climate change policies and institutions; vulnerability to climate change impacts; and low capacities for adaptation and planning. Recent interventions through the Intended Nationally Determined Contributions (INDC) set out the pledges and intentions of these countries on climate change mitigation for the post-2020 period. Despite programmes and initiatives to address climate change issues, these countries are confronted with gaps on the available climate information and low capacity to collect, analyze, and use robust and reliable climate information to inform decision-making and to mainstream climate change adaptation and risk measures into national development plans and policies.

The project aims to strengthen the capacities of African countries to produce, understand and deploy appropriate climate information and best practices to support decision-making and support development planning, reduce the vulnerability of the selected countries and foster a food-sure Africa. Specifically, the project aimed to: 1) identify and analyze climate information needs, provide support for climate information production, synthesis, and use; 2) build the capacities and knowledge of stakeholders (government agencies, research institutions, extension agents and contact farmers) to produce and utilize high quality, demand-driven climate information for adaptation planning and decision-making; 3) facilitate the mainstreaming of climate change issues in regional policy dialogues aimed at raising awareness on climate change issues to build the understanding, use and mastery of climate information; and 4) implement a pilot climate change adaptation practice to support better mainstreaming of climate change adaptation into government programmes and policies.

The findings from this project is expected to inform policies and programmes at national and local levels that will enable stakeholders to adequately access climate information that will enable them make informed decisions in production, operations, and utilization among others. These stakeholders include both individuals and institutions at various levels.

About the African Technology Policy Studies Network (ATPS)

The African Technology Policy Studies Network (ATPS) is a trans-disciplinary network of researchers, policymakers, private sector actors and the civil society promoting the generation, dissemination, use and mastery of Science, Technology and Innovations (STI) for African development, environmental sustainability and global inclusion. ATPS has over 1,500 members and 3000 stakeholders in over 51 countries in 5 continents with institutional partnerships worldwide. We implement our programs through members in national chapters established in 30 countries (27 in Africa and 3 Diaspora chapters in Australia, United States of America, and the United Kingdom). In collaboration with like-minded institutions, ATPS provides platforms for regional and international research and knowledge sharing in order to build Africa's capabilities in STI policy research, policymaking and implementation for sustainable development.

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Key Messages

Communication

- Climate information communication is the responsibility of formal scientific bodies such as meteorological agencies. However, climate information that reaches end-users is usually excessively technical, ill-matched to their demands and easily leads to the misunderstanding of the uncertainties associated with it.
- The generation and communication of climate information are not well linked to development processes and thus not utilized effectively to inform sectoral plans and policy decisions.
- The success of bridging climate information gaps will depend on the ability to institutionalize two-way communication between producers and end-users on a sustainable basis.
- Processes to engage scientists, policy-makers and practitioners around the uptake of climate information into long-term decision-making should be flexible and respond to stakeholders' changing needs.
- Establishing partnership and networks creates a common platform for the generation of well harmonized and consolidated climate information for decision making.

Investments

- The effective use of climate information can enable policymakers to make investment and planning decisions that are proactive, durable and robust for appropriate climate decision-making.

- Organizations responsible for communicating climate science should be aware of the social value of the information they provide, and the legitimacy of the goals pursued by policy-makers. They must adhere to principles of honesty, precision, transparency and relevance when communicating climate information.

Capacity and Foresight

- Funds for adaptation and mitigation are available and offer several opportunities for African countries.
- African countries must build their capacities (individual, institutional and systemic capacity) to access the various components of the adaptation and mitigation funds such as the Green Climate Fund.
- Foresight studies allow countries to effectively plan, organize and implement multiple climate-proof projects in a sustainable and coordinated way.
- Integration of foresight studies (scenario planning) into the various development planning is critical for future adaptation and resilience building.
- Foresight studies represent a paradigm shift from the traditional (linear) planning method due to the growing complexity and uncertainties of societal challenges.

1. Introduction

1.1 Background

Africa remains the most vulnerable to the impacts of climate change due to the low adaptation capacity and high exposure to climate extremes. It is a continent where the provision of seasonal climate predictions and multi-decadal climate projections remains challenging because of a mix of factors, including poor records of climate observations, poor simulation of inter-annual and decadal climate variabilities, and limited climate science investments (Shongwe et al., 2009; Washington et al., 2013; Kusangaya et al., 2014; Vincent et al. 2015). Several studies have concluded with a high level of confidence on the severity of the current and future impacts of climate change and the implications for Africa's economy. The negative effects of climate change on social, economic and environmental systems have intensified the calls from various stakeholders, including development agencies, scientific institutions and civil society organizations to generate and deploy appropriate climate information in African countries (Jones et al., 2014; Vincent et al. 2015).

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strengthening the capacities of African countries to understand and deploy appropriate climate information and best practices to inform decision-making and support development planning. The project focused on five countries namely: Cameroon, Kenya, Malawi, Nigeria and Tunisia.

1.2 Rationale

Despite the efforts made by various national and international initiatives, there is still lack of access to consistent climate and weather information to properly inform decision-making at the national and local levels. The density and coverage of existing climate data observation networks at the country levels are generally described as poor and sparse (Washington et al., 2006; Parker et al., 2011). Current development strategies and plans in African countries are not adequately informed by climate science due to the limited availability of reliable, useful and useable climate data and information produced by national meteorological services and research institutions. Climate information and data services are needed to inform decisions in the climate-sensitive sectors of national and local economies and to improve the resilience and adaptive capacity of local communities. There is, therefore, need for African countries and other stakeholders at the various levels to put in place robust mechanisms to strengthen their resilience capacity and to adapt to the impact of the changing climate. Strengthening the capacity of African countries to generate and utilize climate predictions, products, and information services is critical for supporting long-term adaptation planning and safeguarding the socio-economic development gains achieved at the local and national levels.

2. Methodology

A mixed approach to data collection and analyses, drawing data from both primary and secondary sources were used. Content analysis of scientific literature including peer-reviewed articles, research papers and review papers, unpublished literature such as policy documents, strategy and actions plans, project reports, consultancy reports, donor reports and climate documentaries was done.

Specific documentation accessed and reviewed from the target countries, included among others, national vision documents, national growth and development strategies, climate change and adaptation strategies and policies, nationally determined contributions, national adaptation programme of action, climate investment plans, national environmental policies and strategies, national disaster risk management policies and strategies, national health policies, national agricultural policies, national water policies, national tourism policies, urban policies and national energy policies. Implicit or explicit in all these documentations is the relevance of climate change as a causal element or a threat to the achievement of the goals and objectives stipulated in these documentations.

The rationale for employing the systematic analysis was to identify the kind of discourses around climate change and the kind of climate information that informed decisions in the target countries. The analysis was also conducted to identify the existing gaps in climate information generation and usage as well as the types of information required to address climate change issues in the target countries. The outcome of this analysis also informed the selection of key stakeholders who were engaged in the stakeholder dialogue at the learning platform.

Semi-structured interviews were conducted in the five countries targeting key informants from government agencies and ministries (including national development planning commissions, environmental management agencies, meteorological services and ministries of environment and natural resources, agriculture, water, energy, transport and tourism), research institutions, civil society organizations, universities, international organizations such as United Nations Environment and private companies involved in the generation of climate information and data services. Also interviewed were climate information users including farmers, insurance companies, transporters, pastoralists and traders among others.

These interviews were conducted to interrogate the status and extent to which climate information is used in the execution of the mandates of the various agencies, institutions and on the rate of production and use of climate information and services in the target countries.

A three-day regional workshop that targeted policymakers, scientists from research institutions and technical experts from meteorological departments, sector planning agencies, development agencies and civil society organizations was convened. The regional workshop, which brought together 50 participants representing the different categories of key actors was aimed at offering a platform for these important representatives to reflect on the usefulness of climate information services to the formulation and implementation of policies and plans in the identified sectors of the economies of the target countries. The two modes of engagement at the workshop were the focus group discussions (FDGs) and participatory dialogue.

3. Major Findings

3.1 Climate information needs and gaps

One of the biggest challenges in responding to climate change is how to pin down the information needed to understand the risks and hence be able to plan effectively to address them. Despite the fragmented nature of climate data collection in the study countries, it became evident that the current volume of available information is massive. Sorting through these documentations and identifying the specific requisite information to address the questions being posed may be beyond the capacities and resources available to both experts and decision-makers in the study countries.

There are significant gaps between the questions posed by decision-makers and the answers available. From the discussions held with key stakeholders, all the study countries experience gaps in the integration of climate information into national policies; in the incorporation of climate information into practice at scale; and in existing climate data and services.

The lack of a holistic or integrated approach and long-term support for weather and climate services hinders the use of climate information, particularly at the local scale. According to the World Meteorological Organization [WMO], (2014), there are several critical gaps in the process of climate information generation, processing and dissemination in all the study countries. These include: deficiencies in atmospheric observations due to the inability to maintain networks; inadequate communications systems; lack of training and capacity development; incomplete or missing observations of vital land-surface parameters such as river discharge and lake levels; restrictive data policies; ineffective information infrastructures; and the need

to rescue, digitize and develop historical climate data sets (WMO, 2014). The review of the existing gaps suggests that the National Meteorological and Hydrological Services (NMHSs) in all the study countries require some form of modernization following a long period of underfunding, poor maintenance and perceived irrelevance due to low visibility.

Several sectors are sensitive to climate change impacts. The United Nations Development Programme (UNDP) identified eight climate-sensitive sectors: agriculture, livestock, fishery and aquaculture; biodiversity; water; energy and mining; industry; sanitation and health; urban development and public works, and human development (UNDP, 2011). Unfortunately, these sectors have not adequately utilized the available climate information in their planning and implementation of plans and projects. However, the aviation sector is the only sector that has utilized climate information optimally to ensure the safety of air transport.

Other sectors such as agriculture have also utilized climate data admirably but there is still need to do more in the sector to address food security issues as well as build resilience against climate change impacts. The health sector has only used climate information sparingly in providing early warning in situations where there is predicted adverse weather conditions that will lead to the spread of certain weather-related diseases.

3.2 Collection, analysis and dissemination of climate information and services

The user needs for climate information vary and are very dynamic. It is not a situation of one size fits all especially for most African countries. The sectors of concern for the majority of climate information service (CIS) providers vary and are focused on agriculture and livestock,

water and water resources, financial/planning, environment and natural resources, energy, research and development, health, media, construction/infrastructure, and disaster management (World Bank Group, 2016). The study identified the following common challenges that confront the process of collecting, analysing and disseminating climate information and services in the study countries.

- i). **Lack of sophisticated climate tools:** The lack of technical and computing facilities at the various agencies hinder the application of technologies and equipment which would improve the generation and access to climate information. Climate tools are also not available for local scales and especially for climate downscaling purposes. Some of the technologies including satellite-based systems are in limited use by climate service providers due to lack of technical capacity to apply them.

- ii). **Quality of climate information services:** Many actors in the climate information system are offering various climate information services and products. However, a key challenge for most of the study countries is the lack of a common framework for sharing of information or procedures of operation directly defining the generation of user-oriented climate information products. This hinders the process of review of the climate products and services products to define and justify quality.

- iii). **Appropriateness of scale:** Different climate users have different information needs and these vary in temporal, spatial and even in form. The need to decentralize climate information to the county, state or provincial levels has triggered diverse demand for climate services that are appropriate for user-level decision-making.
Although the national or federal level products are expected to be downscaled to the local, county or state levels, these different

levels create demand for unique products some of which need to be regenerated. The tools to support such downscaling and the procedures are also not well developed and/or documented.

- iv). **Communication:** The diversity of user needs in the country, and also the difference in culture, language, and literacy levels are key challenges in the development and communication of climate information. These are compounded by lack of the right technology which allows for equitable access to information to all who need it. Most climate information comes in a form that might not be readily applied for user-level decision-making either because they are too technical or the method of dissemination becomes a challenge thereby hindering accessibility and applicability.

- v). **Interpretation:** The application of climate information requires an understanding of both the technical aspect of the information and the applicative needs of the users. This requires the effort of interpreters such as the agricultural extension agents who understand the technical aspects of the content of the climate information and also the user applicative needs. However, this is usually not the case, mainly because some of the CIS come in technical languages, or may not have the right content or form recommended for applicability.

4. Conclusion

Climate information has not been used effectively wherever and whenever it is available in many of the African countries. This is partly because of the low capacity to collect, interpret and package it for use by various end-users such as farmers, pastoralists, conservationists or the policymakers. This has therefore led to the low appreciation of the value of the information generated in the various weather stations in some countries. Various sectors in the countries continue to suffer from risks that could have been prevented or mitigated against if the people responsible had the climate information packaged usefully and on time.

There are a few instances where the countries are beginning to put information into valuable use in a few sectors such as agriculture, conservation, and tourism. In Tourism for instance, short to medium range forecasts are used to advise visitors on the best days or periods to visit particular tourist attraction sites. Up-to-date data that is critical for climate change analysis and information dissemination as well as improved understanding of the climate problems in the context of sustainable national development are not readily available in several countries in a coherent and accessible manner. There is, therefore, need to reinforce the efforts at putting in place a comprehensive climate change information management system that is updated periodically and readily accessible to all. In the study countries, stakeholders are fully aware of the impacts of climate change on socio-economic development, natural resources and the need for climate information.

There are however various challenges caused by limited technical capacity, human resource needs, financial challenges, and limited operating environment for climate information system provisions.

These challenges hinder the provision of climate information, especially at the grassroots levels. These challenges should be overcome but most of all a framework for the collaboration and integration of climate information system needs to be established to properly coordinate climate service within each country. These countries need to adopt a more comprehensive and coordinated approach to the issues of climate change within their national development context than what currently exists.

5. Policy Recommendations

The policy recommendations for closing the gaps in climate information services provision were categorized into three themes namely: communication, climate information utilization, and funding for capacity building and foresighting.

Recommendation 1: Improve communication of climate information and services

Climate information communication is usually the responsibility of National Meteorological and Hydrological Services (NMHSs) and formal scientific bodies. However, climate information that reaches end-users is usually excessively technical, ill-matched to their demands/needs and easily leads to the misunderstanding of the uncertainties associated with it. The generation and communication of climate information needs to be linked to development processes through integration into sectoral plans and decisions as basic service deliveries. The success of bridging climate information gap will depend on the ability to institutionalize two-way communication between producers of climate information and the end-users for sustainable outcomes.

It is therefore recommended that:

- Governments should ensure that climate information is service-orientated and integrated into decision-making process from national through to the community levels.
- Governments should provide an enabling environment for establishing partnerships and networks that will create a common platform for the generation of well harmonized and consolidated climate information for decision-making.

- Governments through the NMHSs should provide platforms to engage scientists, policymakers and practitioners around the uptake of climate information for long-term decision-making that is flexible and respond to stakeholders' changing needs.
- Organizations responsible for communicating climate science such as the NMHSs should be aware of the social value of the information they provide and the legitimacy of the goals pursued by policy-makers. They must adhere to principles of honesty, precision, transparency and relevance when communicating climate information.
- Organizations responsible for communicating climate information should endeavour to provide the information in the format and amount conceivable by the end-users for easy application in decision-making. Language, the scale, and context of the information should be considered while choosing the dissemination pathway.

Recommendation 2: Encourage the utilization of climate information to make key decisions and investments

For effective use of climate information, decision-makers can aid in making investments and planning decisions that are proactive, durable and robust. Effective use of climate information also minimizes the risk that poor decisions can adversely affect – or increase the vulnerability of – other systems, sectors or social groups. Long-term climate information is not necessary for every development initiative, but it is crucial to the sustainability and effectiveness of many targeted investments and planning decisions (particularly long-term investments with long-lived implications).

It is recommended that:

- Notwithstanding the need for awareness-raising across a variety of stakeholders and sectors, consideration should be given to efforts that promote medium to long-term climate information provision in places where there is little to no demand from decision-makers.
- Governments together with the relevant stakeholders should develop policies or provide incentives for users that make it compulsory to ensure that climate information is considered as part of the factors used in deciding/developing plans and projects across all sectors.

Recommendation 3: Explore opportunities for funding and capacity development in climate science and foresight studies

Funds for adaptation and mitigation of climate change are available and offer several opportunities for African countries to use. These funds (Adaptation Funds and Green Climate Funds) and capacity building opportunities offer African countries the opportunities to build their capacities (individual, institutional and systemic capacities). Foresight studies allow countries to effectively plan, organize and implement multiple climate-proof projects in a coordinated way. Integration of foresight studies (scenario planning) into the various development planning is critical to future adaptation and resilience. Foresight studies represent a paradigm shift from the traditional (linear) planning method due to the growing complexity and uncertainties of societal challenges.

It is recommended that:

- African Governments should set aside funds to support capacity building of staff working at the NMHS and those working in the relevant sectors that use climate information to make informed decisions. These funds should be used in organizing required training for the officers in the relevant areas of need as well as in foresight and scenarios building to enhance their capacity in planning and decision-making. These funds should also be used to procure advanced and efficient equipment for climate data collection, analyses, presentation and final dissemination.
- Researchers and scientists in the field of climate science need to develop their skills and capacity for accessing the available funds for adaptation and mitigation of climate change. This is because currently, Africa ranks lowest among the countries that are able to access the available climate funds for adaptation and mitigation.

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