



# BENIN: STRENGTHENING CLIMATE INFORMATION AND EARLY WARNING SYSTEMS IN AFRICA FOR CLIMATE RESILIENT DEVELOPMENT AND ADAPTATION TO CLIMATE CHANGE

## Issues

It is expected that as climate change unfolds in Benin, the variability of the frequency and intensity of climate related shocks will increase, thereby necessitating various socio-economic sectors to adapt. Benin's vulnerability to weather risks was recently demonstrated in 2010 when Benin suffered more than USD 262m in losses to various socio-economic sectors (e.g., agriculture, commerce, and infrastructure) due to flooding (Figure 1). Similarly, Benin's coastal region, home to over 3 million inhabitants and one of West and Central Africa's largest trading markets (Dantopka), has been victim to coastal encroachment by as much as 16 meters per year causing major impacts on fishing, port industries and tourism (Ceda 2007, Dossou 2007).

In a developing country such as Benin, climate change impacts are exacerbated by limited outreach mechanisms to local levels and a country dependence on subsistence agriculture. For Benin, improving Climate Information (CI) collection and developing an Early Warning System (EWS) is an effective way to build the general population's weather / climate risk awareness so that communities (particularly rain-fed farmers) can prepare accordingly. However, currently, an early warning system for multi-risk forecasting (e.g. coastal surge and flooding) as well as the capacities to produce and disseminate weather/climate information does not exist in Benin.

There are various barriers to generating and disseminating extreme weather warnings including i) insufficient coverage of weather, climate and hydrological monitoring infrastructure required to support the generation of reliable forecasts, ii) slow data transmission from manual hydro-meteorological

## Project Summary

- Country: Benin
- Project Budget: \$4,000,000
- Project Funding Source: LDCF (GEF)
- Project Co-Financing: \$14,511,549
- Project Period: 2013-2016
- Implementing partners: Directorate on Water
- Target areas: Malanville, Tanguieta, Savalou, Grand-Popo, Adjohoun and Aguegues

infrastructure, iii) poor long-term budget planning, iv) insufficient technically skilled human resources, v) lack of collaboration between independent, localized early warning-related initiatives, vi) inconsistent cross-sectorial information dissemination and data sharing, vii) no standard operating procedure to disseminate warnings and viii) a need for weather/climate information to be tailored to user-needs. The Least Developed Country Financing (LDCF) will address these constraints to ensure more climate-resilient development.



Figure 1: 2010 flooding impacts in Benin (Source: Government of Benin, PDNA 2011)

## Actions

This project will enhance the capacity of the hydro-meteorological services and networks to monitor and predict climate variability and extreme weather events, namely floods, droughts, sea level rise and strong winds. Weather forecasts and

climate predictions will facilitate Benin to respond to extreme weather events and plan for long-term climate resilient development planning at the national and sectorial levels. To assist with long-term planning and to strengthen decision-making, weather risk / climate change information will be collected and climate service delivery will be strengthened through the delivery of the following two outcomes:

1. Enhanced capacity of national hydro-meteorological services and environmental institutions to monitor extreme weather and climate change

Weather and climate monitoring equipment will be procured and rehabilitated including rain gauges, Doppler flow meters and synoptic weather stations. A mix of manual and automatic stations will be used to support a gradual transition to a fully automated information collection system. Sea level and coastal erosion monitoring equipment will also be purchased including spare parts and tools to facilitate future maintenance. Technical institutions will receive training on data storage and analysis as well as training on how to manage and properly budget for the expanded observation network and associated recurring costs.

2. Efficient and effective use of hydro-meteorological and environmental information for making early warnings and seasonal forecasts which feed into long-term development plans

Component 2 will focus on improving national and decentralized technical and operational capacities of the recently created Disaster Risk Management Unit (ANPC) and locally-based NGOs/CSOs to disseminate alerts, ensuring that women are also alert recipients. This will include having knowledge transfer sessions where technical information production institutions will teach alert providers how to communicate the technical jargon of weather bulletins and forecasts. In order to have effective alert dissemination, a Standard Operating Procedure (SOP) for communication will be developed. Relevant agencies will also be provided privileged communication equipment (e.g., CB radios) to effectively disseminate alerts. A feedback mechanism (via SMS, toll-free numbers and local focal points) will be provided to ensure that end-users are engaged in communication from the bottom up.

The project will also reinforce the capacity of national information production agencies to work cross-sectorially so that climate data can be properly integrated into long-term planning and poverty reduction strategies. Simultaneously, the agencies will gain the capacity to tailor early warning products to various socio-economic sectors, both public and private, based on end-user needs (e.g., specific timescales).

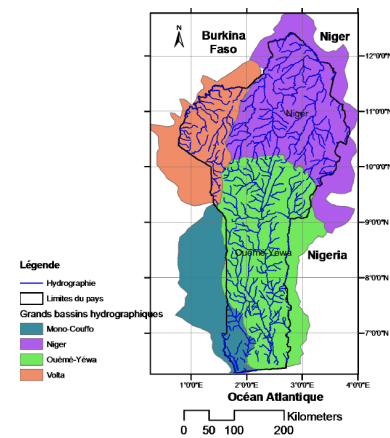


Figure 2: Trans-boundary watersheds and river network in Benin, (Ministry of Water, Benin)

### Expected Impacts

The project will establish sustainable financing mechanisms to support continual weather and climate services by building the capacity of weather and climate information producers to develop revenue-generating products. Together with satellite imagery used for land-use planning and monitoring, tailored climate products will provide significant local environmental benefits, such as detailing best coastal management practices to help Benin’s fight against coastal erosion.

The project will furthermore facilitate inter-agency and cross-boundary data sharing. This is particularly critical for Benin because all of its watersheds cross into neighboring countries (Figure 2). As such, hydrological and weather forecast models require data exchange upstream to set appropriate initial and boundary conditions.

Finally, the project will have beneficial impacts on communities by providing them timely flood warnings and localized seasonal forecasts. Forecasts will be tailored to various sectors such as small-scale rain-fed agriculture and large scale cotton cultivation to improve production and reduce susceptibility to food insecurity. Coastal warnings will also be used to increase the preparedness of communities along the coast to mitigate potential consequences of coastal storm surges, erosion and flooding.

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