

The role of ‘nature-based solutions’ for climate change adaptation and sustainable development in the Volta and Tana river basins



Volta River estuary, Ghana
Photo: Tim Ellis, IWMI

The challenge

Managing water resources in the Tana River (Kenya) and Volta River (Ghana-Burkina Faso) basins to achieve food security and poverty reduction is a challenging task. In the Tana River basin increasing urban and agricultural demands as well as the development of new hydropower plants are competing with existing ecosystem requirements. Similarly, in the six Volta River basin countries, uncoordinated water resource development is taking place to support agriculture, industry and electricity supply. High levels of population growth fuel the demand, but ecosystems are being degraded as a result. For sustainable social and economic development these challenges need to be addressed and done so within the context of climate change.

How this project is addressing the challenge

Access to water of good quality and sufficient quantity is key to development. Water needs to be accessible for different sectors supporting various livelihoods. Providing good access offers the potential for significant development solutions. These are often considered in terms of built infrastructure (e.g. hydropower dams, levees and irrigation schemes), but natural infrastructure (e.g. wetlands, forests and floodplains) also contribute to development objectives, through functions such as water purification, flood regulation and water storage. Natural infrastructure can also support built water infrastructure as it regulates water and sediment flows from upstream catchments. On the other hand modification of flow and sediment regimes by dams impact downstream freshwater ecosystems.

The ‘**WISE-UP to climate**’ project aims to demonstrate the value of natural infrastructure as a ‘nature-based solution’ for climate change adaptation and sustainable development. WISE-UP is providing analysis, information and tools to help governments, basin agencies, and other stakeholders assess options for climate-resilient water infrastructure development and the associated trade-offs. The project is developing knowledge on how to use portfolios of natural infrastructure and built water infrastructure for poverty reduction, water-energy-food security, biodiversity conservation, and climate resilience. Researchers are working to incorporate ecosystem services explicitly into water infrastructure development in both the Volta and Tana river basins. The key rationale for the project is that better solutions can be found if natural and built infrastructure are considered in tandem, in an integrated manner, to achieve development goals.

How we work

The International Water Management Institute (IWMI) is leading a component exploring the eco-hydrological functions of built and natural infrastructure as sustainable climate adaptation solutions. For each basin, an inventory of built and natural infrastructure will be developed through, amongst others, mapping of ecosystem services at the basin scale. At the local scale, researchers are collecting empirical evidence to improve understanding of the functioning of selected natural infrastructure. They use a multifaceted approach combining expertise in hydrology, agricultural and environmental water management. This information is brought together forming a holistic picture of how the natural infrastructure will respond to specific changes, induced either by built infrastructure and/or climate change. The impact of different climate change scenarios on flow will be determined using hydrological models. The results will feed into water resources planning models to provide insights into trade-offs and enable optimization of different interventions.

Natural and built infrastructure for climate resilience, poverty reduction and environmental health



Gertrude's income from prawn sales is dependent on the provisioning ecosystem services of the Volta River
Photo: Richard Twum

Positive outcomes for local communities

This project aims to have a number of positive development outcomes. Decision makers (for example: government agencies, financing institutions, civil society organisations, NGOs, donors, river basin agencies and infrastructure operators) in the Volta and Tana River basins, will have new evidence, tools and skills for optimizing water infrastructure for sustainable development and adaptation to climate change. New climate resilient and sustainable development investment strategies will also be enhanced through increased recognition of the ecosystem services provided by natural infrastructure. In each of these two river basins the benefits of water resource development can be better achieved through more effective coordination between sectors and countries.

The use of ecosystem services provided by healthy aquatic environments and well-functioning watersheds and river basins, will become more sustainable. This will result in communities in the Volta and Tana river basins being more climate resilient, and enjoying improved livelihoods and enhanced food security.

Project partners:

The project is led by the International Union for Conservation of Nature (IUCN) and involves the Council for Scientific and Industrial Research - Water Research Institute (CSIR-WRI), Ghana, The African Collaborative Center for Earth System Sciences (ACCESS) – University of Nairobi, the International Water Management Institute (IWMI), the Overseas Development Institute (ODI), the University of Manchester, and the Basque Centre for Climate Change (BC3). This project is part of the International Climate Initiative (IKI). The German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) supports this initiative on the basis of a decision adopted by the German Bundestag.

Further information:

This leaflet has been produced by the International Water Management Institute (IWMI).

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For further details about the project, visit: www.waterandnature.org
or www.iucn.org/water_wiseup

About IWMI

The International Water Management Institute (IWMI) is a non-profit, scientific research organization focusing on the sustainable use of water and land resources in developing countries. It is headquartered in Colombo, Sri Lanka, with regional offices across Asia and Africa. IWMI works in partnership with governments, civil society and the private sector to develop scalable agricultural water management solutions that have a real impact on poverty reduction, food security and ecosystem health. www.iwmi.org

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