

Summary of FCFA work in Uganda

[Future Climate for Africa](#) (FCFA) aims to generate fundamentally new climate science focused on Africa, and to ensure that this science has an impact on human development across the continent. FCFA's work in Uganda was carried out by the [HyCRISTAL](#) consortium.



About HyCRISTAL

[HyCRISTAL \(Interating Hydro-Climate Science into Policy Decisions for Climate-Resilient Infrastructure and Livelihoods in Africa\)](#) aimed to develop a new understanding of East African climate variability and change including working with regional decision-makers to support effective long-term (5 to 40 year) decision-making in the face of a changing climate. In collaboration with a range of stakeholders, HyCRISTAL co-developed climate change adaptation options that meet the region's societal needs in both urban and rural areas through a series of pilot demonstration projects, covering urban WASH, rural livelihoods, water management, tea production, and transport and lake levels in Kenya and Uganda.

By developing climate science and helping water users assess their vulnerabilities; the HyCRISTAL project aimed to increase the resilience of communities in East Africa. Working with policy makers, the inter-disciplinary research (hydrology, economics, engineering, social science, ecology and decision-making) of HyCRISTAL quantified risks and provided the necessary tools to use climate change information for decision-making on a 5 to 40 year timescale. This included the production of new, accessible, understandable, and easy to use tools for water resource management in a changing climate.

Highlights from Uganda

- HyCRISTAL implemented pilot projects in Uganda focusing on urban Water, Sanitation and Hygiene (WASH) systems, rural livelihoods, water resource management, and lake transport infrastructure.
- The pilot projects intended to further climate scientists' understanding of local contexts in order to tailor climate information for planning and decision-making processes.
- HyCRISTAL developed a [climate change science summary for East Africa](#), which highlights the key climate science findings of the consortium.
- HyCRISTAL also produced [Climate Risk Narratives](#) for the East Africa region to communicate possible future climate scenarios for [urban](#) and [rural](#) areas and initiate discussions with stakeholders.

Rural Livelihoods in Mukono

HyCRISTAL's rural work in Mukono, Uganda, focuses on developing new pathways for climate research that supports [resilience of rural communities](#) vulnerable to climate change. This involved using long-term climate predictions and local context information to help policy and decision-makers with informed short-term (1 to 3 years) and long-term (5 to 40 years) decisions on rural adaptation.

Using the [Household Economic Approach](#) (HEA) and [Individual Household Method](#) (IHM), HyCRISTAL aimed to understand livelihood patterns and factors inhibiting adaptive capacities of communities. This was informed by further studies on market systems and value chains, understanding community adaptation potentials, and examining policy implications. The outcomes of these processes support the building of an evidence-based pathway to rural adaptation at the county and national levels.

To provide users with access to an integrated resource for climate, crop, fisheries, hydrology, and livelihoods information, the [Integrated Database for African Policymakers](#) (IDAPS) platform is being developed by HyCRISTAL and country partners. At the core of IDAPS is the livelihoods data: this is the point where the resilience of communities, in the face of climate change, can be measured. Livelihoods data in IDAPS is based on the HEA but it also integrates data from other sources to provide policy and decision-makers with actionable insight into the effects that changes in climate may have on specific rural communities.

It hopes to enable targeted, longer term policies to be drawn up and actioned by government agencies as well as shorter term, seasonal decisions to be made by farmers such as providing evidence for the best planting time of a particular crop. Two IDAPS user forums were hosted in 2017 by the Uganda National Council for Science and Technology and in 2018 by HyCRISTAL. During these meetings key stakeholders were convened to provide valuable input to ensure IDAPS matches the needs and priorities of its stakeholders. The rural work in Uganda led to the delivery of a [briefing paper on rural adaptation](#) being delivered to the Ugandan Parliament, as well as contributions to the [Ugandan National Environmental Bill](#).

Urban WASH in Kampala

The Kampala pilot study was focused on the impacts of climate change on the Urban Water, Sanitation and Hygiene (WASH) systems of the city. HyCRISTAL introduced local stakeholders to new climate research emerging from the consortium, while supporting climate scientists to

Filmmaking to support agri-extension in Uganda

Traditionally farmers in Uganda have relied on government or private extension officers for access to climate change information. This means farmers internalise climate messaging from state or private entities and do not get the opportunity to participate in knowledge production processes. Through training local climate change champions in visual storytelling, researchers from HyCRISTAL aimed to use [basic filmmaking](#) as a way to shift traditional one-way knowledge exchange within farming communities in Mukono. The visual storytelling aims to address the mismatch between the information provided to farmers and the information needed by farmers. This allows farmers to produce knowledge in their own language, in a manner which reflects their personal experiences.

identify information that is locally relevant. This involved creating simulations of surface water flooding in Kampala under various plausible climate scenarios, then talking with local community groups about their [lived experience of flooding](#) to check the local relevance of the flood model. HyCRISTAL used the discussions to help understand the complexity of the issues, and developed an [informational video](#) to share their stories.

One of the key aims for HyCRISTAL was to synthesise data of flooding, infrastructure and services into useful tools. Flood modeling efforts have been carried out previously, but little evidence exists of this being translated into useful management tools or design interventions. Combining new flood models with sanitation, infrastructure and socio-economic maps, HyCRISTAL has developed a geo-spatial health hazard model to examine the health impacts of flooding in the city. This model allows various climate scenarios and infrastructure interventions to be explored, showing the impacts they will have on likely flood extents and depths, and health outcomes.

The process of developing the model has created opportunities for discussions between a range of stakeholders including advocates for informal communities. The work has highlighted that people have little agency in managing flood risks around their homes, and that WASH systems need to be considered in the context of wider city infrastructure systems - with implications for policy and planning in Kampala. The work has been positively received by local stakeholders such as the Kampala Capital City Authority (KCCA) and the National Water and Sewerage Company (NWSC) and equipped them with an improved understanding of options for risk reduction and clearer dialogue around investment and decision-making.

Water resources in the Lake Victoria Basin

HyCRISTAL partnered with the Ugandan Ministry of Water and Environment (MWE) to improve the use of climate information in [Integrated Water Resource Management in the Lake Victoria Basin \(LVB\)](#). As MWE was in the process of developing catchment management plans for the newly established Water Management Zones, there was a clear opportunity for the HyCRISTAL team to develop strong working relationships with MWE to produce climate information. Improving the understanding of the impacts future climate change has on water resources strengthens the case for no-regret interventions in water resource planning and investment through building resilience to existing and future risks.

Comparing data from the Pan-African Convection-Permitting Regional Climate model (CP4-Africa) and global climate models (CMIP), HyCRISTAL was able to assess future changes in river flow in the LVB. For example model results for the Katonga River indicate increased rainfall in the catchment exceeds the increase in evaporation, leading to higher river flows overall. This improved understanding of the implications of climate change, plays a large role in defining socio-economic measures within catchment management plans, particularly in terms of balancing water supply and demand to address any deficits.

Assuming the model adoption by MWE, the co-production and embedded learning from the impact modeling in the LVB can be used in the future for both long-term strategic planning (assessment of climate change impacts and scenario analysis) and for operational purposes (eg. seasonal forecasting of river flows). A stakeholder workshop is planned for early 2020 to disseminate results from this work.

Lake Victoria lake levels and transport

The HyCRISTAL Transport Pilot Projects (HyTpp) funded through the [DFID Corridors for Growth](#) Trust Fund (C4G TF) examined changing lake levels in Lake Victoria under possible climate change, as well as the changing lake outflows and the impacts on lake transport infrastructure and management. Climate scenarios were based on changes from an ensemble of climate models (CMIP, CP4-A and P25), and two complementary lake-level modelling approaches.

HyCRISTAL's analysis demonstrated how possible future lake levels may be markedly different to levels that have been observed in the recorded past. The results indicate the risks of wetter and drier climate scenarios on the lake which need to be incorporated into decision-making. The results were shared with the World Bank (C4G TF administrators) via a series of skype calls, a Lake Victoria Workshop in 2018 and the HyCRISTAL annual meetings

in 2018 and 2019. Results were shared with stakeholder at a workshop in 2019 with representatives from Uganda and the East African Community. Engagement with the World Bank uncovered the apprehension of stakeholders in dealing with uncertainty, however successive calls aided in building a common ground in understanding the needs and possibilities. These engagements help shift consultants away from cost-benefit approaches towards incorporating risks based on plausible ranges.



HyCRISTAL Annual General Meeting 2018 in Kampala. Credit CCKE

Selected Additional Resources

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HyCRISTAL team at HyCRISTAL Annual General Meeting 2019 in Kampala, Uganda. Credit: CCKE, FCFA

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