



REACH: Improving Water Security for the Poor in Turkana County, Kenya



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Aim of the project

The **REACH** programme aims to produce robust and accessible evidence for governments, municipalities and other investment/policy decision-makers in Africa (Kenya and Ethiopia) and South Asia (Bangladesh), to ensure sustainable delivery of water services to multiple users at scale, and better understand the cost-benefits and trade-offs associated with investment decisions. It addresses the interactions between water security risks and poverty reduction across three intersecting dimensions: resource sustainability, inclusive services and sustainable growth. This case study focuses on the study site in Lodwar, Kenya.



Dates

2015–2021



Countries

Kenya



Local communities must travel long distances in search of safe water in Turkana County, Kenya. (Source: D. Ochieng Ong'ech, 2018)

Aim of co-production:

The co-production of information by researchers and formal agencies (county government and NGOs) and private sector partners is intended to build research capacity, deliver interdisciplinary research and increase demand for science to promote and improve water security. Stakeholders are engaged in:

- undertaking institutional and household level water audits to gather data, including on current climate risks;
- provision of information on the quality and sustainability of water sources, supply and use behaviour, and participation in the mapping and testing of quality of borehole water and auditing the connection and reliability of piped water supplies; and
- providing information that has been used to generate climate and hydrological scenarios/tools that helps decision-makers to make better decisions by incorporating considerations on risks and trade-offs.

This continuous engagement, through stakeholder group meetings and focus group discussions, better informed the research framing, the current research, and also facilitates uptake of the research findings by policy/decision-makers and practitioners.

Context:

Lodwar Town is a newly emerging and rapidly growing town with considerable potential for development, since the institution of devolved governance across Kenya in 2010, and the recent discovery of economically viable oil deposits. Water stress is a key concern for Lodwar and several stakeholders have an interest in the water sector. Equitable provision of safe water is a challenge and can only be achieved if all stakeholders are committed to achieve the goal of equity.

Seasonal rainfall forecasts have been regularly available from the national meteorological service, although their value has decreased because the users perceive the predictions as sometimes unreliable. However, weather and climate information, and other relevant knowledge, is being embedded in the drought monitoring system that is part of the mandate of the National Drought Management Authority (NDMA). Most actors in the water sector use this 'translated' climate information, rather than direct reference to the drought forecast, to inform decisions.

A Country Diagnostic Report was produced in 2015, to help frame the parameters for knowledge co-production (REACH, 2015). The co-production was planned at project level, at the scale of Lodwar Town. The co-production process is highly collaborative and involves interactive workshops with local government and associated committees, and water user groups. Co-production is intended to help stakeholders understand the complex interaction between rainfall variability, water security, and poverty, and how to mitigate these.

Who was involved and what were their roles?

The multi-country REACH programme is led by an interdisciplinary team from the Oxford Water Network at Oxford University, UK. The disciplines within this network include geography, environmental

What was co-produced?



- **Water audit:** A water audit was conducted, in June 2017, to document the details of the supply and distribution of water to Lodwar Town. The water audit identified certain areas (e.g. Nakwamekwi area) that suffer from water shortages partly due to inadequate yields from boreholes (Dulo et al., 2017). The town's piped water supply is occasionally interrupted, requiring citizens to rely on untreated water sources, for example from the local river, or from privately-operated tankers for supplying water (browsers) (Haines et al., 2018).
- **Stakeholder coordination:** Multiple actors in the sector were identified, their interactions, where power is located, those with ability to influence decisions, and those who make decisions and their sources of funding were clarified (Haines et al., 2017). The research was then able to improve the understanding of the role of stakeholder coordination in identifying opportunities and challenges for water security interventions in an area of significant hydroclimatic variability, climate shocks, governance challenges and multiple competing priorities for water use.
- **Climate and hydrological information** to support stakeholders in the water sector has been produced. There is only one climate observing station in Lodwar town, so satellite and model data were used to understand better the spatial variability of rainfall during the different seasons and trends through time (Olago, 2018).
- **A novel decision-making tool** was applied to model the response of the Turkwel River basin's water resources system to growing demand for water and climate stressors (Hirpa et al., 2018). This computer-based decision-making tool allows decision-makers to understand the ways in which the water supply and demand system responds to climate variability under different water use scenarios. For example, increased water demand, especially due to expanded irrigation, has a strong negative impact on the resilience of the basin's water resource system to droughts caused by the global climate variability. Such new insights have been shared with stakeholders so that they are better able to comprehend the risks to groundwater resources.



Benefits of the co-production approach

- Setting up Water Security Observatories to collect data over a long time period on social vulnerability and water use in water stressed environments allows for the measurement of the socio-economic impacts of water vulnerability.
- Improved water security, and improved data fed into planning for various outcomes, including drought early warning systems.
- The research programme has achieved government buy-in, which is important to bring in sectors that may not normally be considered climate sensitive, such as security services.
- Initiation of a five-year Water Service Delivery Plan for Lodwar Town will improve the county's ability to design, deliver and monitor water security interventions. The climate data generated are being used to inform this delivery plan.
- Implementation of the Women in Water (WiW) fora revealed some previously unconsidered gendered aspects within the water sector.

change, enterprise and the environment, engineering science, biomedical engineering, international development, anthropology and zoology. REACH is implemented by national teams that form a consortium of global leaders in water science, policy and practice. The Kenya programme is a partnership with hydrologists, climate scientists, behavioural scientists and environmental law from the University of Nairobi's Institute for Climate Change and Adaptation.

A wide range of stakeholders participated in the co-production by providing information and validating data. These included national government and Turkana county water management authorities, the Kenyan Meteorological Department, National Drought Management Authority, National Environmental Management Authority, as well as local companies, UN organisations, NGOs and civil society groups.

How was co-production done?

The co-production method is designed to support data-driven decision-making and to tailor scientific information to the decision-making context through regular consultation and feedback.

Identify key actors and build partnerships

In the initial phase of the research there was a ten-week study of the institutions involved in water decision-making that focused on access to, knowledge of, and use of weather and climate information and how much weather/climate knowledge is integrated into water decisions in Lodwar Town.

Co-explore need

Local resident communities described the specific contexts in which climate information is used and also the limitations of currently available information. For example, they expressed a need for improved information on rainfall seasonality as the seasonal calendars that they were accustomed to were no longer reliable due to increased rainfall variability. They also connected rising insecurity (livestock raids) to periods of acute water stress and raised how reliable climate information would assist them and local law enforcement agencies to put security measures in place during periods of higher risk.

Interviews with the local government's water management institutions – Water Resource Authority (WRA), Ministry of Water and Sanitation – and the Kenyan Meteorological Department showed that their planning was hampered by climate data gaps and a paucity of information on river flows between the Turkwel Gorge dam and Lodwar Town.

An important output of this project is that it highlights the need for improved climate services. For example, Hirpa et al., 2018 reported that the increasing demand on ground water sources due to expanded irrigation exerts a significant negative impact on the resilience of Lodwar's water resource system to droughts caused by global climate variability. The local meteorological service identified the challenge of delivering reliable seasonal forecasts based on observations from a single observing station in a very large county with nomadic communities and serious security concerns. The cost of station data and the complicated process required to negotiate access to them also limited data sharing. The research noted that an effective water management strategy would require investment in an improved hydro-climatic monitoring system and a need to understand better the drivers of the increasingly variable rainfall and its inter-linkages with surface and ground waters.

Lessons to learn from:

- **Broaden the data sources:** There are large Arid and Semi-Arid Land (ASAL) regions that are underserved by climate observation stations on

the ground. Use of satellite-based data offers the best solution currently to redress this situation as they offer local data at good scale.

- **Capacity needs to be built up:** The use of climate data and services for decision-making has not achieved its full potential as the capacity of the users needs to be built to understand the data outputs, while data producers also need to learn how best to package the information for users. Co-production of climate and hydrological data for planning and management is skewed towards the experts due to its technical nature, the required computing resources and know-how to make use of large global datasets. For this reason, with few exceptions, the users are only able to participate at the data gathering stage. Consequently, the capacity to develop evidence-based data in institutions that manage water resources, and that of the practitioners and people affected at large, to understand and interpret such outputs, needs to be enhanced.

This research is ongoing, and it will be important to re-examine these lessons and feed the learnings back into the study design as the research progresses.

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