

Participatory workshop for interdisciplinary research on water scarcity and climate change in the Ewaso Ng'iro North River Basin

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Water scarcity in the Ewaso Ng'iro North River Basin is posing a range of challenges, such as hampering livestock production and causing conflict between upstream and downstream users. Water in the basin is scarce due to recurrent droughts, over-abstraction of water for domestic and economic activities, climate change, and limited knowledge of surface water and groundwater. Water pollution through increased urbanization, agricultural and industrial activities is also an issue. A lack of long-term data on water resources in the basin makes it difficult to develop robust hydrological models. In addition, there is a lack of political will to develop and enforce legislation to manage water resources sustainably.

The workshop addressed the pressing issues of **water scarcity and climate change** in the Ewaso Ng'iro North River Basin. Its specific objectives were to foster discussion on these **challenges**, identify **solutions**, take stock of **current monitoring activities**, pinpoint **gaps in knowledge and data**, and build a **strong network of partners**. It was organized by the Wyss Academy for Nature and the Centre for Training and Integrated Research in Arid and Semi-Arid Landscapes (ASAL) Development. The workshop was attended by 52 people from a wide range of organizations, including representatives of community conservancies, the Northern Rangelands Trust, the Isiolo County Executive Committee Environment, the National Environment Management Authority of Laikipia County, the Financing Locally-Led Climate Action from the surrounding counties (Baringo, Isiolo, Laikipia, Marsabit, Samburu), researchers from Kenyan universities, and conservation NGOs.

Workshop outcomes

This section is an overview of the discussions that took place during the workshop, of which a full report can be found [here](#).

Objective 1: Foster discussion on the challenges faced by stakeholders in the context of water scarcity, climate change and biodiversity change in the basin. The workshop established the foundation to build a strong network of collaborations. It consisted of six topical sessions on water scarcity, climate change, land use change, biodiversity, water restoration and monitoring, water governance and human well-being, with a total of 22 oral presentations and five co-creation activities. The water scarcity in the basin is mainly attributed to poor governance of natural resources. This, in turn, gives rise to various issues such as illegal or over-abstraction of water, water pollution, conflicts between humans and wildlife, and loss of livelihoods. Other challenges are the deterioration of water catchments' quality and functionality, soil erosion, invasive alien species, and the compounding effects of climate change. Additionally, the lack of alternative livelihoods, coupled with a growing human population, further exacerbates the situation.

Objective 2: Identify existing and potential solutions to the challenges related to water scarcity, climate change and biodiversity change. Nature-based solutions (NbS) were the focus of much discussion, as they can be used to improve rainfall infiltration, reduce surface runoff, and increase water storage. Examples of NbS include afforestation, reforestation, biological

control of invasive species, water harvesting techniques and ecotourism. Other solutions include improved water management practices (e.g. catchment-scale Integrated Water Resource Management) and strengthened water governance (i.e. developing and enforcing water laws and regulations, and establishing basin-wide water management institutions). Targeted environmental education for Water Resource User Associations is seen as a useful way forward, although some issues (e.g. upstream water abstraction) are legal issues that can only be resolved through government intervention. Also, increased access to climate finance could be used to support the implementation of NbS and other water scarcity solutions. Finally, better communication between the different groups involved in the water sector would help avoid duplication of efforts and activities.



Photo by Inne Vanderkelen

Objective 3: Identify ongoing monitoring activities related to water scarcity, climate change and biodiversity change in the basin.

A synthesis across all sectors revealed an extensive network of water and biodiversity monitoring, albeit one that is not easily accessible to universities and local communities. It was clear that there is an urgent need to improve water monitoring – of groundwater, water abstraction and water quality – to enable interventions and ensure water health. In terms of biodiversity, terrestrial and avian biodiversity is thought to be well recorded, but aquatic biodiversity is poorly sampled. Opportunities to improve monitoring could include more sharing of data and studies, a more effective use of remote sensing data, and engaging local communities in mapping (e.g. through citizen science projects).

Objective 4: Pinpoint gaps in knowledge, data and communication.

There are gaps in long-term data on environmental, climatological and hydrological variables, making it difficult to assess changes in these variables over time and to develop effective adaptation strategies. More weather stations are also needed to capture the high spatial and temporal variability of precipitation in ASALs, particularly in some specific areas that are poorly covered (e.g. Mandera, Wajir, Garissa, Marsabit and the lower catchment).

There is a need for more comprehensive mapping of ecological infrastructure and NbS. Other informational gaps were identified in data on land use and land cover change in the ASALs and data on wetland area and status. The drivers of some of these landscape changes need further investigation, particularly habitat and species-specific change (data on aquatic and soil biodiversity are particularly lacking), the spread of invasive alien plants and the extent of land degradation.

Objective 5: Strengthen a collaborative network of partners (particularly regarding data access, data sharing, and contributing to field and research missions) to turn knowledge into actions.

The workshop highlighted the potential for strong collaborative opportunities to address water scarcity in the Ewaso Ng'iro basin, and attendees expressed a desire for such workshops to become a regular feature of their work calendars. The fifth co-creation session also identified missing stakeholders and opportunities for further collaborations.

Next steps

Based on the workshop discussions and idea collection, the ID Water Scarcity project, in collaboration with its partners, will prioritize addressing the most urgent research gaps. This includes assessing the impact of climate change on water resources, enhancing understanding of upstream surface water and downstream groundwater interactions, evaluating the distribution of aquatic biodiversity, exploring solutions for water resources restoration and monitoring, and developing socio-economic scenarios. The forthcoming actions of the project are to form **working groups in NbS monitoring, climate and hydrological modelling, aquatic biodiversity and socio-economic scenario development**, initiate regular WG meetings, create a collaboration platform for regular updates within WGs, and organize annual workshops (next one planned in spring 2024). In addition, the Wyss Academy for Nature is working on developing a knowledge and engagement platform that will be used across all projects within the Wyss Academy.



Photo by Cornelius Okello

ID Water Scarcity Project

The ID Water Scarcity project is a Wyss Academy-funded research project that employs interdisciplinary methods in climate and biodiversity science to address research gaps related to water scarcity in the Ewaso Ng'iro North River basin, the largest water catchment in Kenya. You can find the full publication of the Synthesis Report on the ID Water Scarcity Workshop 2023 as well as this summary here: www.wyssacademy.org/publications / DOI: <http://dx.doi.org/10.48350/189258>

Partners & Collaborators

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