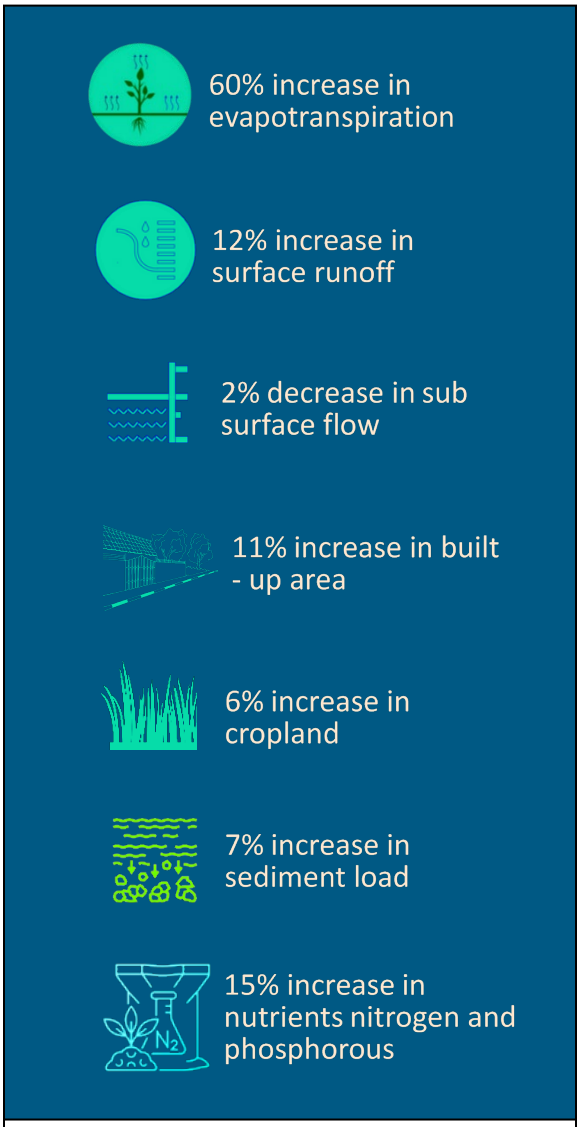
LASER PULSE

Policy Brief

Data for Decision: Enhancing Water Security in Tanzania

Water Security refers to the capacity to have enough water of sufficient quality and at the right time to support livelihoods, ecosystems, and economic activities[1]**.** Water security is well enshrined in Tanzania's National Water Policy of 2002[2] and Water Resources Management Act, No. 11, 2009[3], amended in 2022. The latter recognizes water—in particular, safe drinking water—as a basic human right that is essential for life. Section 22 (1) of the Act provides a framework for managing water resources through Basin Water Boards. Furthermore, access to clean and safe water is recognized within the National Water Policy as a basic need and right for all human beings, with stated priority on its provision of adequate and acceptable quantity and quality to meet basic human needs. According to the Water Utilization (Control and Regulation) Act of 1974[4], all the water in the country is owned by the United Republic of Tanzania. The act provides everyone with right of use but does not provide the right to own the water. Such a right to use water is supplemented by a prohibition to pollute water as highlighted in Tanzania's Water Laws (Miscellaneous Amendments) Act Number 8 of 1997[5], Section 29(d).



Graphics showing changes in Simiyu Watershed in the past 30 years[6].

The EA Water Security Project

A water security project (2020-2023)[6] was implemented in three countries in East Africa (Tanzania, Uganda and Kenya) under the leadership of Purdue University with financial support from LASER PULSE. The Project partners were Global Water Partnership Tanzania, University of Dar es Salaam, Resource Plan Ltd of Kenya, Makerere University and Aidenvironment of Uganda. The project's overall goal was to provide water

[1] Grey, D. and Sadoff, C. W. (2007). Sink or swim? Water security for growth and development. Water policy, 9(6), 545-571.
[2] United Republic of Tanzania (2002). National Water Policy. Government of the United Republic of Tanzania.
[3] United Republic of Tanzania. (2009). Water Resources Management Act, 2009. Government of the United Republic of Tanzania.
[4] United Republic of Tanzania (1974). Water Utilization (Control and Regulation) Act, 1974. Government of the United Republic of Tanzania.
[5] United Republic of Tanzania (1974). Water Laws (Miscellaneous Amendments) Act Number 8 of 1997. Government of the United Republic of Tanzania.
[6] See Acknowledgements at end for project information.
[7] Munishi, S., & Kibugu, C. (2023). Simiyu SWAT modelling in Tanzania. LASER PULSE Project.

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information, data access, and decision support to improve water security in East Africa. In Tanzania, the project was implemented in the Simiyu Catchment.

Basic Information & Key Takeaways

- Simiyu Catchment hosts major wetlands on which local communities rely for their livelihood.
- Changes in land use as a result of increased anthropogenic activities in a changing climate, have jeopardized the integrity of the Simiyu Catchment resources.
- Increased point and non-point pollution from domestic, industrial, and agricultural activities is indeed contributing to siltation and eutrophication of the Simiyu River system.
- Climate projections in the catchment have indicated a rise in total annual precipitation and temperatures.
- Effective management of observed and projected impacts of climate change requires strategic interventions that involve multiple stakeholders.
- Immediate remedial efforts are required to increase the number of water sources for the communities in the catchment.

Case Study: The Simiyu River Watershed is part of the larger Lake Victoria basin, with the Simiyu River draining into Lake Victoria. The catchment is significant as it contributes a great deal of agriculture, fishing and livestock keeping thus supporting the food security in the country. The catchment covers a total area of 10,659 km^2 and is located between Simiyu and Mwanza regions in Tanzania (33.15° to 34.90° E and 2.15 ° to 3.20 ° S). The annual rainfall of the catchment ranges between 700 mm to 1000 mm with an average temperature ranging between 22.5 °C and 23 °C. The Simiyu River has four main tributaries, including Duma, Mato, Kisamba and Lumeji which converge into the main Simiyu River and discharge into Lake Victoria at the Speke Gulf in the southeastern part of Lake Victoria. About 60% of the catchment is covered with sandy loam soil. Tropical savannah and shrubs are the main land covers with improved cultivated land downstream of the catchment.

The inhabitants of the catchment are highly dependent on rain-fed agriculture and livestock production[8]. The water towers of the Simiyu River Watershed originate from the Serengeti National Park (SNP) and the Maswa Game Reserve which are world-famous tourist attractions. The presence of a national park in the catchment generates human-wildlife interaction that requires proper management to ensure the sustainability of the ecosystem[9]. Thirty years ago, the Simiyu River catchment used to be vegetative, with umbrella-like thick tree canopies. Such extensive vegetation moderated the catchment hydrological cycle where water was abundant for wild animals, economic activities, and the environment. With population growth, there has been progressive increase in cultivated and built up areas, and most of the forest cover has disappeared. This has led to increased overland flows leading to enhanced flood events and increase in sediment loads.

Impacts of land use and climate change on water resources

For the past 20 years, rainfall in the Simiyu River Watershed has been observed to increase by close to 40% especially during the long rain season. However, during the dry season, rainfall has been decreasing especially in June, July and August. Future climate projections (2030-2060) indicate that rainfall will increase by close to 60% and temperature will increase in the range of 0.6°C to 2°C. The annual actual evapotranspiration is projected to increase by close to 60%. However, on the monthly scale especially during the wet months of February, March, April, and October, actual evapotranspiration is set to increase by 90%. Higher actual evapotranspiration values will adversely affect and lead to decrease in soil moisture and recharge to groundwater. This will have an

[8] Tumbo, M. (2007). Community Vulnerability and Adaptation to the Impacts of Climate Variability and Extremes on Simiyu Wetlands: The Case of Simiyu Wetlands, Lake Victoria Basin.

[9] Rusch, G., Stokke, S., Roskaft, E., & Mwakelebe, G. (2005). Human-wildlife interactions in western Serengeti, Tanzania.

implication in maintaining stream flows during the dry season. Hydrological model simulations indicate an increase in future flows and sediment load in the Simiyu River, especially during the wet months. The ongoing uncontrolled landcover and land use changes in the catchment will have a huge influence in partitioning the hydrological cycle in the catchment. This calls for progressive and dedicated awareness creation on sustainable land use and conservation practices with deliberate interventions on policy guidelines as well as strategic investments in catchment restoration.

Policy interventions

Water security of the Simiyu River Watershed is at stake due to the uncontrolled transformation of landscapes. This is further exacerbated by impacts of climate change on water resources, environment, wildlife, and the nexus thereof. Effective management of observed and projected impacts of climate change requires strategic interventions that involve multiple stakeholders. Despite being highlighted in policies such as the National Water Policy 2002 and regulations like the Water Management Act 2009, challenges arise mainly in implementing the prescribed interventions due to incoherence in coordination among sectors and or stakeholders. Some of the highlighted interventions include enhancing conservation efforts by improving drainage systems plus gazetting riparian lands to restrict human activities within the prescribed buffer zone of 60 meters from the riverbank. This is aimed at managing the quality of water especially influx of pollutants from agricultural and livestock activities plus enhancing the stability of the riparian land by planting water friendly trees. Such trees have the benefit of attenuating and dampening floods, reducing surface runoff, and enhancing percolation and hence recharge of groundwater. Immediate remedial efforts are required to increase the number of water sources for the communities in the catchment. Such efforts need to be aligned to the general population growth in the Simiyu Region which indicate that, in 2012, the population of the region was 1.6 million, while in 2022, the population was estimated to be 2.2 million. Some of the potential interventions include promoting rainwater harvesting in anticipation of the projected increase in precipitation, as depicted in Figure 1, and construction of underground water storage tanks which can be made locally. Effective implementation of these interventions will require an integrated approach where different agencies including the Lake Victoria Basin Water Board, local NGO's and the relevant District Local Government Authorities in Simiyu Region will need to map and identify priority areas before mobilizing requisite resources.

Policy Brief for Tanzania

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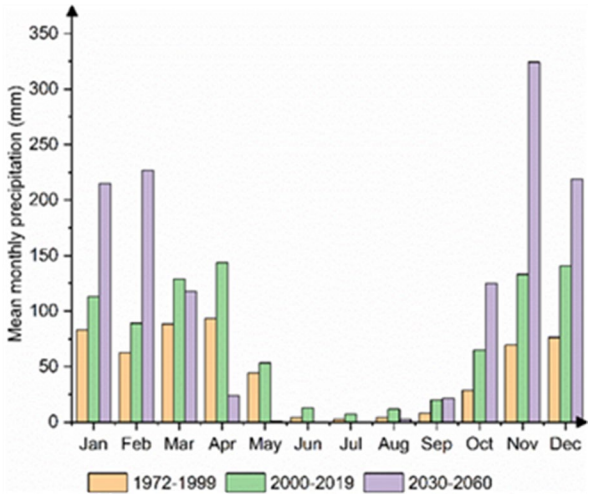

Figure 1: Historical, present, and future mean monthly precipitation through 2060[6]