

## WATER RESOURCES PROFILE SERIES

The Water Resources Profile Series synthesizes information on water resources, water quality, the water-related dimensions of climate change, and water governance and provides an overview of the most critical water resources challenges and stress factors within USAID Water for the World Act High Priority Countries. The profile includes: a summary of available surface and groundwater resources; analysis of surface and groundwater availability and quality challenges related to water and land use practices; discussion of climate change risks; and synthesis of governance issues affecting water resources management institutions and service providers.

## Tanzania Water Resources Profile Overview

Tanzania is considered to be water abundant, however, heterogeneous climate and geology contribute to significant seasonal, interannual, and geographic variability in water availability and water quality challenges. Water stress is moderate according to the Falkenmark Water Stress Index<sup>i</sup> as total annual renewable water per person is approximately 1,680 m<sup>3</sup> and only 13 percent of its total water resources are abstracted by major economic sectors, which is less than SDG 6.4.2 water stress benchmark<sup>ii</sup>. However, increasing demand and a developing economy could increase water stress without improved management.

Key sectors fueling demand for surface and groundwater include agriculture, animal husbandry, hydropower, and mining, while environmental flow requirements are also generally high due to the significant coverage of key nature reserves.

Increased abstraction and impoundment of surface water for flood irrigation and hydropower in the Pangani and Rufiji Basins have disrupted river flow regimes, reduced seasonal surface water availability, and threaten biodiversity.

Agricultural and mining runoff, untreated municipal and industrial wastewater, and inadequate sanitation systems degrade surface and groundwater quality. Lake Victoria and Lake Tanganyika have declining dissolved oxygen levels driven by organic pollution, agricultural runoff, invasive species, and climate change.

Naturally high concentrations of fluoride and arsenic reduce groundwater quality, particularly in the Rift Valley, and pose public health risks.

Precipitation is projected to increase due to climate change, although the probability of extreme drought and increasing inter-annual rainfall variability will also grow. Heavy rainfall events will constitute a greater portion of received precipitation, compounding vulnerability to heavy flooding.

Tanzania's watersheds form the basin areas for three of Africa's longest rivers, including the Nile, Congo, and Zambezi, in addition to several prominent transboundary lakes such as Lake Victoria, Malawi, and Tanganyika. Tanzania is party to several transboundary agreements and conventions. These agreements have facilitated increased regional cooperation and funding for improved management of shared water resources, international disputes regarding water use and hydraulic development persist. Additional investment is needed to strengthen joint monitoring and water allocation agreements.

Low funding for the water sector and key institutions such as basin water boards has slowed the development and implementation of basin management plans and impeded monitoring and enforcement of water user permits as well as monitoring and management of agricultural runoff, industrial effluent, and municipal wastewater. Groundwater quality monitoring systems need to be strengthened to protect the public from utilizing contaminated water sources.

<sup>i</sup>The [Falkenmark Water Stress Index](#) measures water scarcity as the amount of renewable freshwater that is available for each person each year. A country is said to be experiencing water stress when water availability is below 1,700 m<sup>3</sup> per person per year; below 1,000 m<sup>3</sup> is considered water scarcity; and below 500 m<sup>3</sup> is absolute or severe water scarcity.

<sup>ii</sup>SDG 6.4.2 measures [water stress](#) as the percentage of freshwater withdrawals against total renewable freshwater resources. The water stress thresholds are: no stress <25%, low 25%-50%, medium 50%-75%, high 75%-100%, and critical >100%.

# Water Resources Availability

## KEY TAKEAWAYS

- Tanzania experiences water stress according to some key metrics, and high population growth and development will lead Tanzania into a state of water scarcity in the next few decades.
- Several continental river basins originate in Tanzania, including the Nile, Congo, and Zambezi, along with several prominent international lakes. The Rufiji Basin possesses the largest share of Tanzania's renewable water resources.
- Aquifer characteristics are variable across Tanzania, although groundwater is generally accessible at reasonable drilling depths and robust pumping rates across most of the country.

This section summarizes key characteristics of surface and groundwater resources. Table 1 summarizes key water resources data and Figure 1 presents key surface water resources, wetlands, and dams.

### Surface Water Resources

Tanzania has nine major drainage basins (see Figure 1): Lake Victoria, Pangani, Wami Ruvu, Rufiji, Ruvuma & Southern Coast, Lake Nyasa (Lake Malawi), Lake Tanganyika, Lake Rukwa, and the Internal Drainage. The Rufiji basin is the most water abundant, with approximately 40,500 million cubic meters (MCM) of annual total renewable water. The Lake Tanganyika, Ruvuma & Southern Coast, Lake Nyasa, Lake Victoria, and Lake Rukwa have between 10,000 and 15,000 MCM whereas the Pangani, Internal Drainage and Wami Ruvu Basins have between 5,000 to 8,000 MCM.<sup>6</sup> Tanzania has six prominent transboundary lakes, including Lake Victoria, Lake Tanganyika, and Lake Nyasa, which are among the top ten largest lakes in the world by volume.<sup>7,8</sup> Further, 22 large dams provide over 5,000 MCM in reservoir capacity. The Mtera Dam is the largest in Tanzania (3,800 MCM).<sup>9</sup>

### Groundwater Resources

Groundwater primarily exists in fractured basement and unconsolidated alluvial layers in the north, and fractured sedimentary layers in the south, although the hydrogeologic characteristics within these layers vary significantly.<sup>10</sup> Total renewable groundwater supply is estimated to be 30,000 MCM/year<sup>2,3</sup> and average borehole depth is around 60 meters (m).<sup>11</sup> The deepest boreholes (60m-100m) are found in the northeast and along the southeastern coast whereas boreholes are typically 40m-60m deep in all other regions.<sup>11</sup> Shallow boreholes less than 30m are not uncommon, especially around Lake Victoria and Lake Tanganyika. Well yields are robust and sufficient for domestic use as boreholes yield an average 2.9 liters per second (L/s), nationally.<sup>11</sup> However, boreholes tend to concentrate in more productive alluvial aquifers in the east, while the average yields in the north, west, and central Tanzania are closer to 1 L/s.<sup>11</sup>

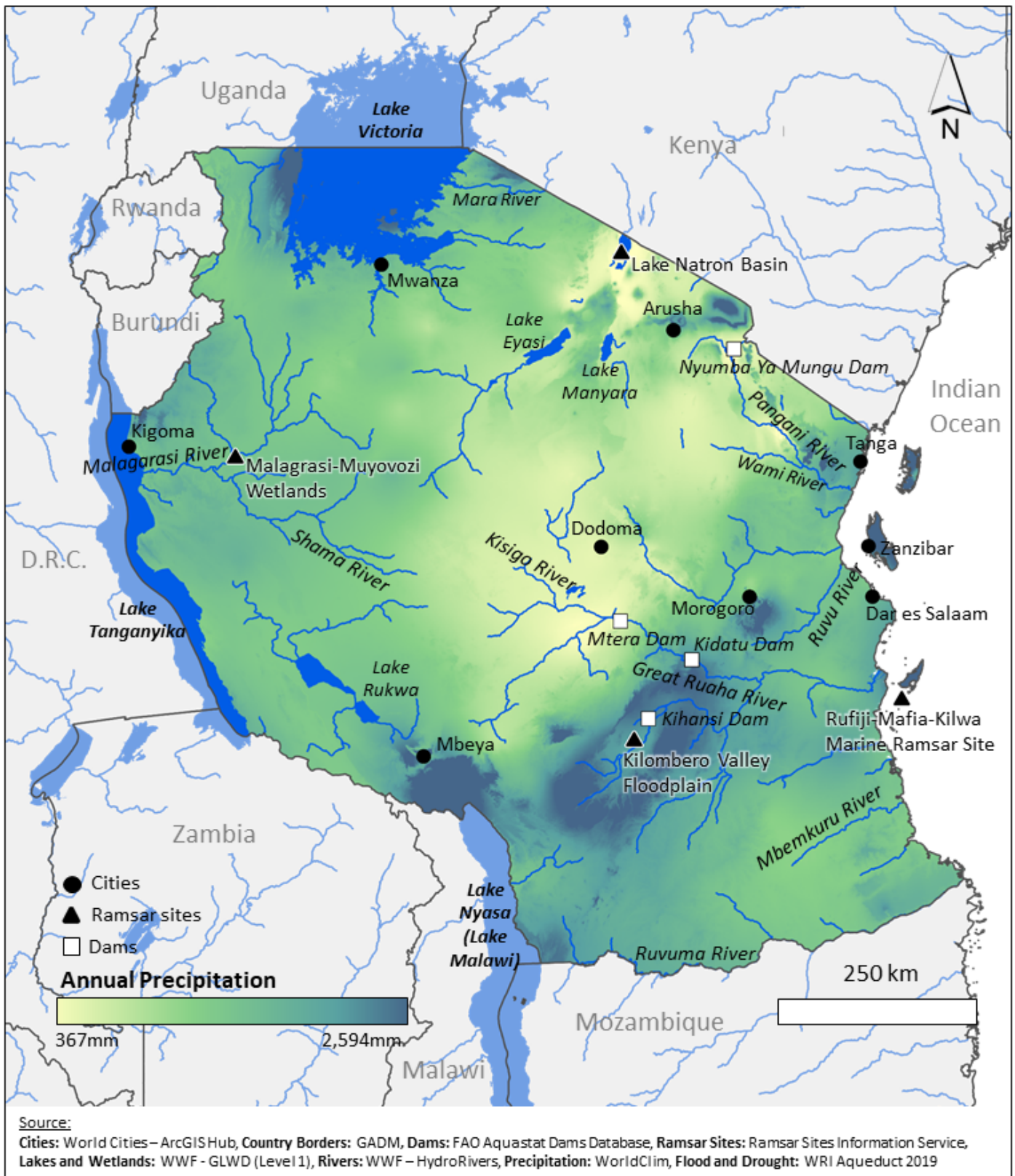
TABLE 1. WATER RESOURCES DATA

	Year	Tanzania	Sub-Saharan Africa (median)
<u>Long-term average precipitation (mm/year)</u>	2017	1,071	1,032
<u>Total renewable freshwater resources (TRWR) (MCM/year)</u>	2017	96,270	38,385
<u>Falkenmark Index - TRWR per capita (m<sup>3</sup>/year)</u>	2017	1,680	2,519
<u>Total renewable surface water (MCM/year)</u>	2017	92,270	36,970
<u>Total renewable groundwater (MCM/year)</u>	2017	30,000	7,470
<u>Total freshwater withdrawal (TFWW) (MCM/year)</u>	2002	5,184	649
<u>Total dam capacity (MCM)</u>	2015	4,199 <sup>iii</sup>	1,777
<u>Dependency ratio (%)</u>	2017	12.75	22.78
<u>Interannual variability</u>	2013	2.7	1.55
<u>Seasonal variability</u>	2013	3.2	3.15
<u>Environmental Flow Requirements (MCM/year)</u>	2017	56,280	18,570
<u>SDG 6.4.2 Water Stress (%)</u>	2002	12.96	5.70

Source: [FAO Aquastat](#)

<sup>iii</sup>This excludes theoretical storage potential of the Owen Falls Dam in Uganda, which would increase national storage by raising Lake Victoria's water level, as the Dam currently operates as a run-of-the-river hydropower plant.

**FIGURE 1: MAP OF WATER RESOURCES**



# Surface Water Outlook



## KEY TAKEAWAYS

- Surface water withdrawals for flood irrigation account for the majority of water abstractions. Hydroelectric power generation is a major non-consumptive source of demand.
- Over-abstractions for irrigation are depleting river flows and converting some perennial rivers into seasonal ones, threatening water availability and biodiversity.
- Pollution, invasive species, and climate change are lowering dissolved oxygen levels and impacting aquatic ecosystems in Lake Victoria and Lake Tanganyika.
- Surface water quality is diminished by natural contamination from fluoride and arsenic, heavy metals from mining, and pathogenic contamination from poor sanitation systems.

**This section describes key sources of demand and uses of surface water, and associated challenges stemming from water availability and water quality challenges.**

**Irrigation accounts for 85 percent of all surface water withdrawals, primarily by smallholder farmers using flood irrigation.**<sup>3,12</sup> The greatest demand for irrigation is in the Lake Rukwa, Pangani, and Rufiji Basins. Irrigation demand is expected to double by 2035, including a projected 400 percent increase in the Lake Tanganyika, Lake Nyasa, and Internal Drainage Basins. Projections also indicate that municipal and industrial demand will increase by 180 percent and 300 percent respectively. Tanzania relies extensively on hydropower and the government plans to expand hydroelectricity generation capacity.<sup>12</sup>

**Over-abstraction from irrigation and dams are threatening perennial availability of surface water.** Competition and over-abstraction of surface water has increased water stress in the Pangani Basin, which is the country's breadbasket and a critical source of hydropower. The Pangani Basin features small-scale irrigation systems in the highlands and large-scale commercial schemes in the lowlands.<sup>12,13</sup> Since the 1960s, dry-season irrigation abstractions and water storage for hydroelectric production have reduced the Pangani River's flow from 100 m<sup>3</sup>/sec to 37 m<sup>3</sup>/sec.<sup>13</sup> Competition for water has lowered the water table, increased saltwater intrusion and salinization of coastal soils, and caused the Kirua Swamp in the middle of the river to dry up.<sup>13-15</sup> Similarly, irrigation of large rice fields in the upper Rufiji Basin have caused parts of the Great Ruaha River to dry up during dry years. Reduced flows in the Great Ruaha River, which normally contributes 22 percent of the Rufiji River's flow, also constrains hydropower generation at the downstream Kidatu, Kihansi, and Mtera dams, which represent a majority of total hydropower and hydro-thermal power capacity.<sup>16,17</sup>

**Biodiversity is threatened by dams, over-abstraction, and pollution.**<sup>12,18</sup> The Mara River, which is essential to the Serengeti wildlife migration and the tourism it draws, is threatened by large-scale irrigation abstraction, sediment loads from mining and forest clearing, and more

extreme and frequent seasonal floods and droughts.<sup>19</sup> Similarly, there are concerns that the proposed Stiegler's Gorge hydropower plant on the Rufiji River, which would be the fourth largest dam in Africa and ninth largest in the world, would harm the Selous Game Reserve, which is one of the largest UNESCO Heritage Sites.<sup>20</sup> Dams have threatened biodiversity in the past when environmental flows and impacts are not adequately considered. Lake Rukwa is a brackish water source and is a critical habitat for crocodile, hippopotamus, pelicans, and around 20 endemic fish species. Up-stream dams and diversions for irrigation have reduced river and stream inflows and lowered average lake levels by 6m in the past decade.<sup>23</sup>

**Untreated industrial effluent, particularly from mining, are polluting surface waters with toxins such as mercury, lead, and chromium. Natural contamination from fluoride and arsenic is also a risk.** Tanzania's mining sector is valued at close to \$1 billion and has experienced rapid growth in recent years.<sup>26</sup> Approximately 90 percent of gold mining takes place in the Lake Victoria Basin<sup>26,27</sup> but artisanal gold mining is widespread. Use of mercury for gold amalgamation is common<sup>28</sup> and has accumulated in fish and sediments in Lake Victoria, Lake Rukwa, Ruvuma & Southern Coast, Pangani, and Lake Tanganyika basins.<sup>12,29,30</sup> Large-scale gold mining operations often use cyanide in gold processing and mine tailings may be contaminated by toxic heavy metals. Cyanide and numerous heavy metals, including lead, have been detected at dangerous concentrations in the Mara Basin.<sup>27</sup> Heavy metals such as lead, chromium, and copper from various industrial sources and municipal waste have been found in surface water around Dar es Salaam, Tanga, Zanzibar, and Mtwara.<sup>25</sup> Dangerously high lead and chromium levels have been detected in the Msimbazi River near Dar es Salaam.<sup>31</sup> Surface water is also contaminated with fluoride and arsenic. Lake Momella in northeastern Tanzania contains over 450 times the WHO drinking water guideline limit for fluoride.<sup>32,33</sup>

**Climate change, invasive species, and high nutrient loadings from urban and agricultural runoff are contributed to declining dissolved oxygen levels and impacting aquatic ecosystems in major transboundary lakes.<sup>34</sup>**

Hypoxic conditions in Lake Victoria, where dissolved oxygen is measured at less than 3 milligrams/Liter (mg/L), have become increasingly prevalent over the past few decades and may have reduced total viable fish habitat by as much as 40 to 50 percent since the 1960s.<sup>35</sup> Similar expansion of hypoxic zones have been observed in Lake Tanganyika.<sup>37</sup> Tanzania's surface water inflows to Lake Victoria account for 60 percent of the lake's total inflows but 65-76 percent of phosphorous and nitrogen loading.<sup>38</sup> Increasing phosphorous levels drive eutrophication, which has caused algal biomass to increase by over 8 times since the 1950s.<sup>35,36</sup> Invasive species such as the Nile Perch and water hyacinth also

contribute to oxygen depletion through eutrophication, and warming waters are restricting oxygen transfer from the upper to lower levels of the lakes.<sup>36,38</sup> Urban runoff and municipal waste from coastal cities have also been key sources of pollution around Lake Victoria.<sup>38</sup>

**Poor sanitation systems threaten surface water quality and create public health risks.**

Fecal coliforms have been detected in the Msimbazi River near Dar es Salaam. The river is often used to irrigate crops and vegetables sold in local markets were found to be contaminated.<sup>41</sup> Public health is particularly susceptible to pathogenic contamination of surface water downstream of major population centers, in the lower reaches of rivers, during the wet season, and in locations where alternative groundwater supplies are less accessible (such as in Lake Rukwa Basin).<sup>25,32</sup>

## Groundwater Outlook



### KEY TAKEAWAYS

- Groundwater is primarily used as a domestic water source, especially in rural areas, and boreholes are most concentrated in the Internal Drainage and Wami Ruvu Basins. Aquifers underlying Dodoma and Dar es Salaam are depleted.
- Groundwater is contaminated with naturally high concentrations of fluoride and arsenic, particularly in the Rift Valley. One-third of groundwater sources for drinking water having unsafe levels of fluoride.
- Groundwater is contaminated by pathogenic contaminants. Dar es Salaam has had annual cholera epidemics in recent decades.

**This section describes key sources of demand and uses of groundwater, and associated challenges stemming from water availability and water quality challenges.**

**Groundwater is the primary source of drinking water for most of the rural population and is a minor but important municipal water source.<sup>43,44</sup>**

Half of all groundwater abstractions are for domestic use in rural areas and 10 percent of abstractions are for domestic use in urban areas, particularly where municipal water services are not reliable.<sup>9</sup> Other important uses of groundwater include livestock watering and dry land fishing.<sup>9</sup> Irrigation with groundwater is limited except in the Pangani basin<sup>2</sup> where borehole yields near Arusha have significantly declined.<sup>10</sup> It is estimated that there are more than 52,000 functional water points, more than 6,000 water points that need repair, and 28,000 non-functional water points.<sup>45</sup> The Lake Victoria, Pangani, Internal Drainage, and Rufiji Basins feature the highest number of functional water points, however, dependence on groundwater is highest in the Internal Drainage and Wami Ruvu Basins due to semi-arid and arid climates. Shallow wells are common in rural parts of the Lake Victoria, Lake Rukwa, Ruvuma and Southern Coast, and Lake Nyasa Basins because they are easier to develop and less expensive.

**Key aquifers in the Wami Ruvu Basin supplying Dodoma and Dar es Salaam are being exploited at unsustainable rates.<sup>46</sup>**

Water supply in Dodoma, Tanzania's capital, is abstracted from the Makutopora Aquifer. The number of high-yielding and deep boreholes increased significantly in the late 1990s and early 2000s and abstraction rates have caused the water table to decline.<sup>2,10,15</sup> Groundwater in the coastal region of the Wami Ruvu Basin has also become the major resource for Dar es Salaam, particularly as private industries drill wells to augment surface water abstractions from the Ruvu and Kizinga rivers.<sup>10</sup>

**Groundwater quality is affected by naturally occurring contaminants, such as fluoride and arsenic, as well as mining.**

Concentrations of naturally occurring fluoride are highest in northern Tanzania.<sup>32</sup> Approximately 30 percent of all groundwater drinking sources exceed the WHO guideline limit for drinking water, exposing over 10 million people to unsafe fluoride levels and leading to high incidence of dental and skeletal fluorosis.<sup>iv 32,47,48</sup> Arsenic contamination is also common throughout the broader Rift Valley.<sup>49</sup> A survey of water sources in the Lake Victoria Basin found that 41 percent of sources exceeded national limits for arsenic in drinking water.<sup>33</sup>

<sup>iv</sup>Skeletal Fluorosis is a serious, often irreversible condition which can greatly impact quality of life by causing skeletal deformities that impair mobility.

**Limited sanitation systems contribute to pathogenic groundwater contamination, including in Dar es Salaam, which has experienced several severe cholera epidemics.** Groundwater in Dar es Salaam, Dodoma, Tanga, and Manyara is contaminated with nitrates, which

are associated with poor well construction and fecal contamination.<sup>50</sup> Widespread pathogenic contamination of groundwater has contributed to nearly annual cholera epidemics the past few decades, with the worst cases in Dar es Salaam.<sup>51</sup>

## Water Resources and Climate

KEY TAKEAWAYS

- 💧 Precipitation is variable across seasons and geography. Total precipitation is projected to increase slightly but the probability of extreme drought is also increasing.
- 💧 Climate change is increasing rainfall intensity and causing more frequent flooding that threatens human life and infrastructure, and creates major economic losses, especially on the Ruvuma River and in Dar es Salaam.

**This section covers the climate variability and climate change, their impacts on water availability and water quality, and the risks they pose to local communities and their economies.**

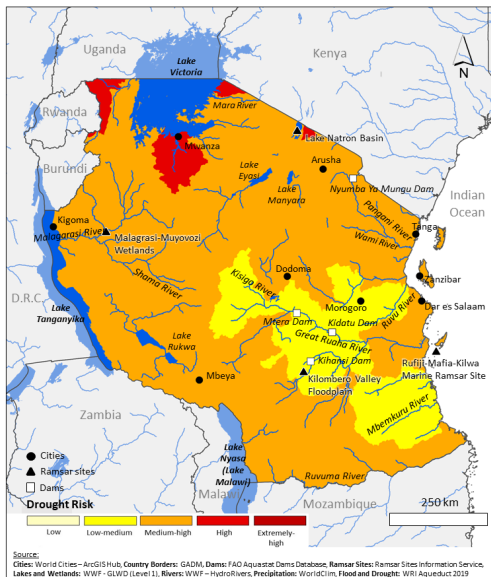
**Precipitation is variable across seasons and geography.** Average annual precipitation is high at 1,071mm; however, the country's complex topography contributes to significant rainfall variability across the country.<sup>1</sup> The central, southern, and southwestern highlands experience a single wet season (October-April) while the northeastern highlands and coastal belt experience two wet seasons (October-December and March-June). River discharge and lake levels generally rise in November and December and reach peak volumes by March and April before receding during the dry season.<sup>2</sup>

**Climate change is increasing precipitation, although the frequency of extreme droughts will increase.** Tanzania's climate is expected to warm 1.0 to 2.7°C by the 2060s<sup>52</sup> and annual precipitation will increase between 50-140 mm by later this century.<sup>53</sup> Gains in precipitation will be slightly offset by higher evaporation rates caused by warmer temperatures.<sup>53</sup> The probability of extreme drought is expected to increase by 4 to 13

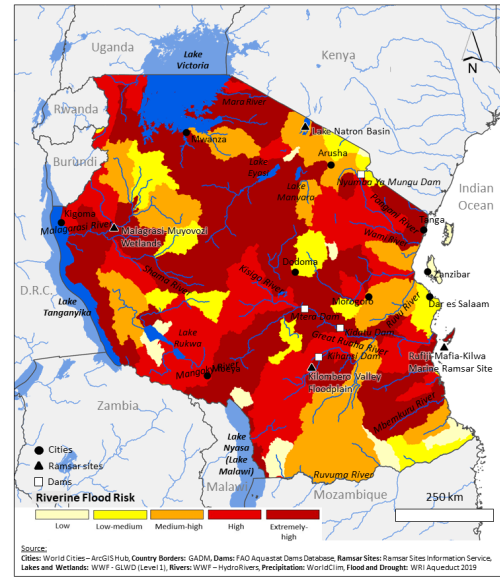
percent due to higher inter-annual and inter-seasonal precipitation variability.<sup>53</sup> Drought risk is already substantial throughout much of the country (Figure 2).

**Tanzania is the most flood-impacted country in East Africa, and climate change threatens to increase the frequency and intensity of storm surges.**<sup>52</sup> An increasing proportion of total annual rainfall will derive from extreme precipitation events, posing the greatest threats to developed areas, valleys, floodplains, and coastal areas.<sup>53</sup> The Ruvuma River in the Ruvuma & Southern Coast Basin already experiences dramatic seasonal flow changes and flooding and this will worsen as rainfall intensity increases.<sup>54,55</sup> Dar es Salaam experiences frequent and severe flooding that is damaging to the economy and infrastructure. A severe flood in 2018 affected at least 39 percent of the city's population and resulted in \$107-227 million in economic losses.<sup>56</sup>

**FIGURE 2: DROUGHT RISK**



**FIGURE 3. RIVERINE FLOOD RISK**



# Water Policy and Governance

## KEY TAKEAWAYS

- Consistently low budgets, weak technical capacity, and poor coordination among sectoral actors impede basin planning and policy implementation.
- Tanzania actively engages in numerous projects, programs, and institutions supporting transboundary management, which is critical to the long-term sustainability of its water resources.

This section provides an overview of key policies, institutions, and management challenges. Key laws, policies, and plans are summarized in Table 2 and the roles and responsibilities of select transboundary, national, and sub-national water management entities are summarized in Table 3.

TABLE 2. KEY LAWS, POLICIES, AND PLANS

Name	Year	Purpose
National Water Policy (NAWAPO)	2002	NAWAPO outlines a national IWRM approach for surface and groundwater management at the basin-level and the development of water supply services and sewerage systems.
Water Resources Management Act	2009	Defines the institutional framework and responsibilities for water resources management through the National Water Board, Basin Water Boards, and Catchment/Sub-catchment Committees. Outlines principles for controlling water pollution, conservation, and stakeholder engagement.
National Water Quality Management and Pollution Control Strategy	2010	National strategy outlining principles, threats, priorities, and sectoral recommendations for water quality protection and monitoring for surface and groundwater.
Water Supply and Sanitation Act	2019	Details the institutional framework and policies for urban and rural water, sanitation, and hygiene service delivery and regulation.
National Water Sector Development Strategy (NWSDS)	2006	National-level plan that defines pathways and timelines for achieving poverty-reduction and development targets, including Tanzania Development Vision 2025.
Water Sector Development Program (WSDP) (2006-2025)	2006	Defines priority interventions and investment needs in the areas of water resources management, urban water supply and sewerage services, and rural water services, with a focus on institutional strengthening and capacity building.

### Water resources management is impeded by limited technical capacity and funding constraints.<sup>58</sup>

Integrated Water Resources Management Development Plans (IWRMDPs) guide basin development and conservation<sup>24</sup> but more work is needed to coordinate surface water allocations across sectors.<sup>60</sup> BWBs have limited capacity and limited access to critical tools, such as hydrological information management systems.<sup>24</sup> The BWBs do not have fully autonomous budgets and rely on the Ministry of Water for staffing support, financing, and other operational assistance. However, national-level funding for water resources management is low. During the 2017-2018 fiscal year, for example, only nine percent of the total water sector budget was allocated to water resources management compared to 85 percent for rural and urban water supply services.<sup>24</sup> The lack of national-level funding compounds limited revenue generation by the BWBs, which collect revenue through user permits

for water abstraction and discharge of effluents. Only the Rufiji, Wami Ruvu, and Pangani River BWBs have been able to meet revenue targets and cover at least 30 percent of their current expenditures.<sup>24</sup> Failure to adequately permit water abstractors weakens monitoring and regulatory enforcement efforts and diminishes critical revenue streams for the BWBs and the Ministry of Water.

### Tanzania is a signatory to several key transboundary water resource management initiatives.<sup>7</sup>

Tanzania has more transboundary hydrological systems than any other African nation, including seven aquifers, five rivers, and six international lakes.<sup>7</sup> The Ministry of Water has a dedicated office within the Water Resources Division to oversee transboundary water activities. Tanzania is aligned with the East African Community and the Southern African Development Community, and also participates in the Nile Basin Initiative, which coordinates management and development of the Nile River.

Tanzania also participates in several transboundary water management and development projects in an effort to promote greater collaboration, coordination, and joint implementation. Examples include the Mara River Basin Management Project, the Nile Basin Decision Support System Project, the SADC Hydrological Cycle Observing Project, the Songwe River Basin Development Program, and the Regional Rusumo Falls Hydroelectric Project. Tanzania has signed on to several bi-lateral and multi-lateral agreements and conventions related to transboundary water management, including a Joint Water Commission with Mozambique, a Joint Songwe River Basin Commission with Malawi, the Mara River Basin Memorandum of Understanding (MoU) with Kenya, and an MoU on the Kagera River Basin Transboundary Integrated Water Resources Management and Development with Burundi, Rwanda, Uganda, and the Nile Equatorial Lakes Subsidiary Action Plan.<sup>6</sup> These transboundary efforts have increased capacity and brought funding to water resources management and development projects, and strengthened diplomatic relations with neighbors.

## Water Quality Monitoring

Water quality monitoring is overseen by the Ministry of Water, which classifies water resources, and the National Environmental Standards Committee (within the Tanzania Bureau of Standards), which sets minimum water quality standards for different uses. The National Water Quality Management and Pollution Control Strategy defines the framework for water quality monitoring, measuring key parameters such as pH, fluoride, chloride, nitrates, and some heavy metals.<sup>9</sup> BWBs are responsible for monitoring the quality of water resources and retain the right to permit, monitor, and enforce compliance regarding the discharge of waste and effluent into waterways. Urban drinking water quality, on the other hand, is led by the Energy and Water Utilities Regulatory Authority (EWURA), which is responsible for monitoring water quality and standards of performance for provision of water supply and sanitation services in urban areas. In rural areas, regular water quality monitoring at the water abstraction point level is the responsibility of RUWASA and the CBWSOs. An analysis of the 2015-2020 budget for the WSDP indicates that water quality monitoring constitutes less than 2 percent of the entire water management budget.<sup>9</sup>

**TABLE 3. WATER RESOURCES MANAGEMENT ENTITIES**

Mandate	Institution	Roles and Responsibilities
Transboundary	Lake Victoria Basin Commission (LVBC)	Transboundary commission under the East African Community, represented by Kenya, Uganda, Tanzania, Rwanda, and Burundi. Coordinates the water resources management and policy in the Lake Victoria catchment towards economic development goals.
	Lake Tanganyika Authority (LTA)	Established in 2008, the LTA is composed of representatives from the governments of the Democratic Republic of Congo, Tanzania, and Zambia. Promotes equitable and sustainable development of the lake's resources in accordance with the Convention on the Sustainable Management of Lake Tanganyika.
	Zambezi Basin Watercourse Commission (ZAMCOM)	International organization that coordinates and manages the development of the Zambezi River among eight member countries.
	Nile Basin Initiative (NBI)	International partnership consisting of 11 countries within the Nile Basin, which encompasses the Lake Victoria Basin as part of its upper watershed. Coordinates development of the basin through a Council of Ministers, NBI Technical Advisory Committee, and NBI Secretariat.
	Pangani Basin Water Board (PBWB)	Bilateral basin management organization between Tanzania and Kenya. Manages water allocations, rights, and drought mitigation planning, among other tasks.
	Ruvuma Joint Water Commission	Bilateral basin management organization between Tanzania and Mozambique for the Ruvuma River.
	Songwe River Basin Commission	Bilateral commission between Tanzania and Malawi which focuses on coordinating hydraulic development of the Songwe River.
National	Ministry of Water	Develops national strategies and policies for water resources management. Responsible for national integrated water management (IWRM) plan based on integrated water resources management development plans (IWRMDP) prepared by the BWBs.
	National Water Board	Advises the Ministry of Water on multisectoral coordination in IWRM and planning. Includes representation from key water resource-related sectors, such as agriculture, energy, forestry, and environment, local government administrations, BWBs, the private sector, and NGOs.



Mandate	Institution	Roles and Responsibilities
Sub-national	Basin Water Boards (BWBs)	Nine BWBs support basin planning and management. Responsible for water resources management, including planning, allocation, permitting, data collection, stakeholder coordination, and conservation.
	Catchment/Sub-catchment management committees	Help coordinate water management and resolve water resources conflicts.
	Water User Associations (WUAs)	Work closely with the BWBs to support conservation efforts, monitor permit compliance, support the collection of water permit fees, and regulate conflict between water users.

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