

Rwanda snapshot on water and climate

About the country snapshot

This country snapshot provides an at-a-glance understanding of the current national water and climate resilience status. It presents the latest information across key climate-smart decision-making categories (water resources and water and sanitation, SDG 6, climate change and disaster risk reduction, financing, governance, gender mainstreaming and social inclusion) in an easily digestible format, extracting the most important details from national and/or international analysis. No data was independently collected for this baseline snapshot, which will be complemented by a follow-up snapshot in mid-2024 to assess incremental progress in our journey to resilience.

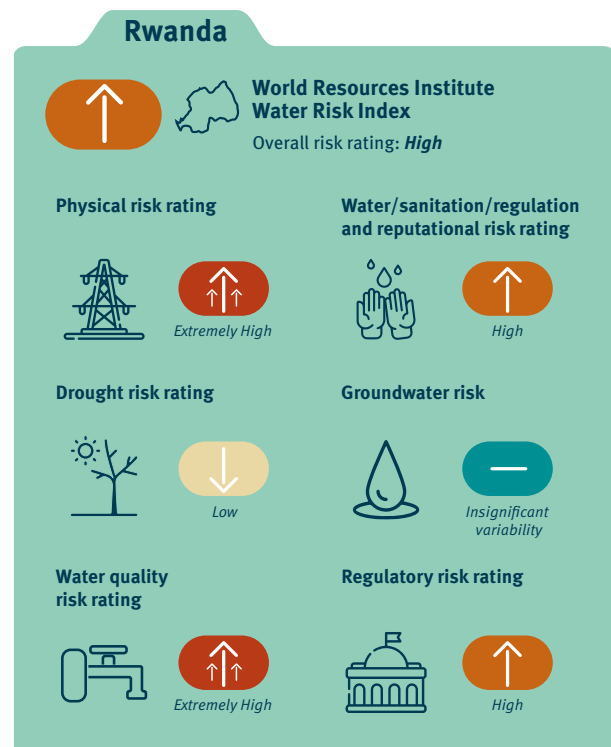
1. Rwanda water resources and water, sanitation, and hygiene

Rwanda benefits from abundant rainfall (average 1,200 mm/annum) but is still characterized as water-scarce due to high population and limited water storage infrastructures, with only 670 m³ of water per capita per year (Ministry of Environment, 2017). Rwanda's hydrographic system is split into two basins divided by the Congo-Nile Ridge: the water systems to the west of the ridge flow into the Congo basin, and those to the east of the ridge flow into the Nile basin. The surface water network covers approximately 8 percent of the national territory, which is equivalent to about 2,143 km². Of the total surface water, the Congo basin drains 10 percent of the country's water, while the Nile basin drains approximately 90 percent (United Nations Framework Convention on Climate Change, 2020).

Rwanda has a wide range of ecosystems, ranging from cooler and wetter mountain rainforests to warmer and drier savannah woodland. Average annual temperatures and precipitation vary, ranging from 15°C–17°C and 1,600 mm in high altitude areas to 30°C and 900 mm in lowlands (Samo et al., 2021). Rwanda has 935 wetlands; in 2016, these were estimated to cover an area of 176,337 hectares.

As well as surface water, Rwanda possesses numerous springs and groundwater. Drilled wells are less common in such hilly terrain, and nearly 90 percent of rural areas can be served by springs or rivers that are protected, or water piped via gravity or solar-powered pumps through the hills. The latest available Integrated Household Living Conditions Survey (EICV5) (2016/2017) indicates that 87.4 percent of the population lives with limited water services, up from 84.8 percent in EICV4. For basic water services, EICV5 reports that 57 percent of households have access to an improved water source within 30 minutes collection time, down from 59 percent in EICV4 (National Institute of Statistics of Rwanda, 2018).

The Government of Rwanda, with other development partners, has made significant progress in enhancing access to clean drinking water. The percentage of households using improved drinking water sources increased from 79 percent to 83 percent



between 2015 and 2020 (UN Water, 2020). Its improved sanitation levels are exceptional for Africa, particularly the high proportion in rural areas. The Water and Sanitation Sector Strategic Plan 2018–2024 (Ministry of Infrastructure, 2018) indicates that access to “basic” sanitation services is at 62 percent countrywide. Coverage stands at 57 percent for rural settings and 64 percent for urban areas.

The [World Resources Institute \(WRI\) Rwanda Water Risk Index](#) provides an overall high score. The physical risk factors associated with riverine flood risk are extremely high, as reflected in the frequent floods that displace thousands of people, and which together with associated landslides destroy key infrastructure, particularly roads, bridges, schools, homes,

electricity networks and agricultural land. Unimproved water, lack of sanitation, and regulatory and reputational risk are rated as high. Drought risk is low, and groundwater has insignificant variability. Water quality risks are extremely high, due to silt and waste from mines and agricultural activities, particularly on the steep hillsides. Regulatory and reputational risks are also high, which is a hindrance to private sector investment that can enhance access to water services and increase economical use of water resources; however, this is being addressed through changes in the current water policy as part of the Government of Rwanda's drive to reduce barriers to public-private partnerships (World Bank, 2021).

A study on the state of soil erosion in Rwanda conducted in 2022 has revealed that an estimated average of 27 million ton of topsoil is lost annually (Rwanda Water Resources Board, 2022). This is about 25 ton per hectare per annum, which has serious negative impacts not only on agricultural productivity due to the loss of fertile topsoil, but also on electricity production and the accessibility of clean water due to high sedimentation in rivers.

This brief reviews data from existing global frameworks that are used at the country level to plan, finance, and manage water resources to meet the challenges related to climate change and development.

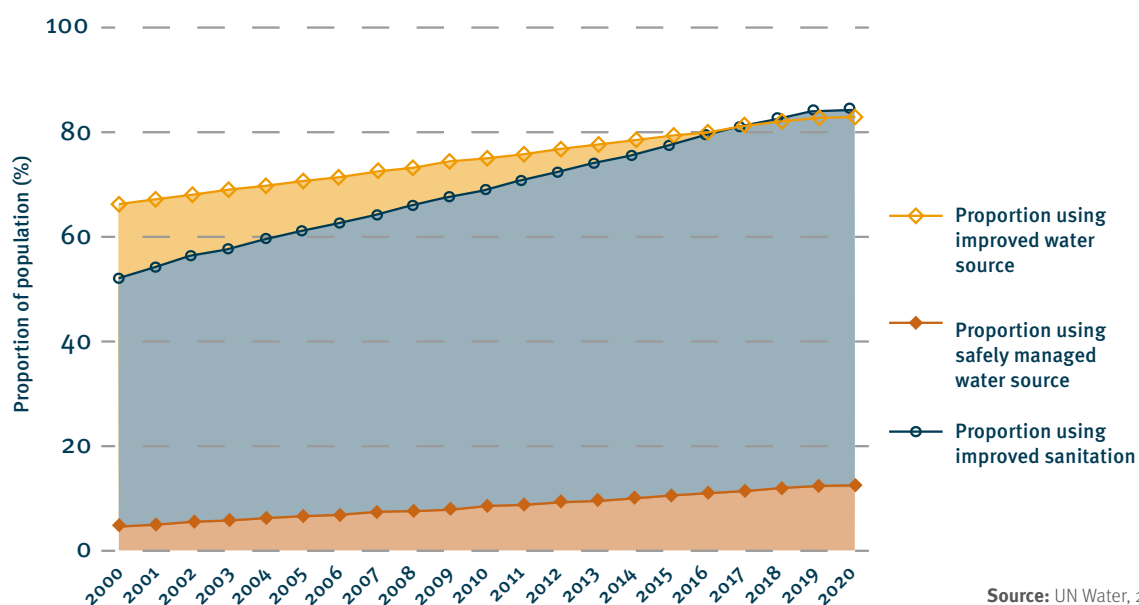
2. Sustainable Development Goal 6: Joint Monitoring Programme and Global Environmental Management System

Rwanda has committed to reach Sustainable Development Goal (SDG) 6 targets through different programmes, such as the National Strategy for Transformation (2017–2024), with the aim of achieving universal access to basic water and sanitation services by 2024 and improving water resources management to mitigate related disasters. To track the progress made to date on water and sanitation, the National Inventory of Water and Sanitation Infrastructure Report documents that Rwanda's rural population is served by more than 1,000 piped water systems and approximately 20,000 improved point sources, including protected springs or boreholes and wells equipped with handpumps. At the provincial level, Kigali City ranks highest, with the largest increase in the use of improved water sources by 11 percentage points between EICV4 and EICV5, reaching 96 percent (National Institute of Statistics of Rwanda, 2018).

The United Nations Statistical Division 2000–2020 data shows that Rwanda has recorded impressive progress on many of the SDG 6 indicators. Change in water use efficiency has increased from US\$10 per m³ in 2007 to US\$13 per m³ in 2019 (UN Water, 2020). The proportion of the population using safely managed sanitation services also increased from 83 percent in 2014 to 86 percent in 2017. SDG 6 targets related to the **Global Environmental Management System (GEMS)** report that Rwanda has low water stress as less than 10 percent of renewable water is extracted. The proportion of water bodies with good ambient water quality stood at 79 percent in 2020.

As shown in Figure 1, as of 2020, 83 percent of the population had access to improved drinking water (up from 79 percent in 2015) and 12 percent had access to safely managed water drinking services (up from 7 percent in 2015).

Figure 1: Proportion of population using safe water and improved drinking water services in Rwanda, progress over time



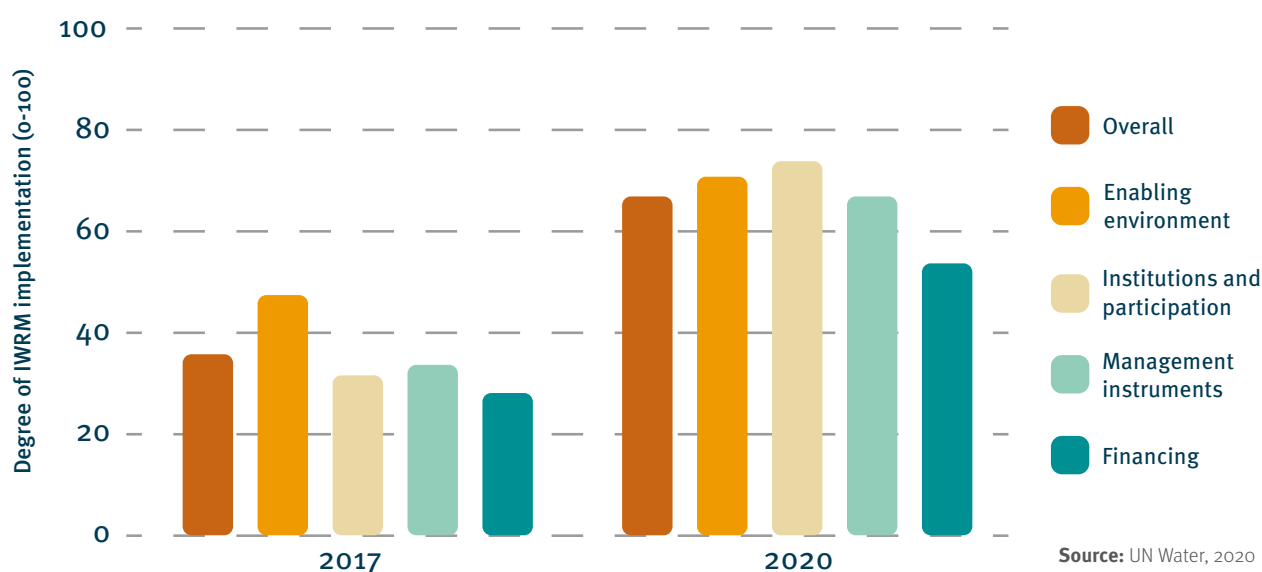
Source: UN Water, 2020

Rwanda's integrated water resources management implementation 2020 outlook reveals significant progress compared to its status in 2015: from 35 percent to 66 percent. Institutional strengthening and public participation show the greatest change, from 31 percent in 2015 to 73 percent in 2020 (see Figure 2). Financing has also increased significantly.

The Rwanda Utilities Regulatory Authority (2020) report on water and sanitation has estimated that Rwanda loses 43.4 percent of the water supplied within different networks due

to leakages, illegal connections, road construction, metering inaccuracies, bursts, blockages, natural disasters, and water theft by inaccurate meters, collectively referred to as non-revenue water (NRW). According to the report, NRW accounted for 5.8 million m³. Of the total 12.9 million m³ supplied between December 2019 and March 2020, only 7.1 million m³ of water was accounted for through the billing systems.

Figure 2: Degree of integrated water resources management implementation in Rwanda, progress over time, by dimension



3. Climate change and disaster risk reduction

Rwanda is experiencing the impacts of climate change. Rainfall has become increasingly intense, and the variability is predicted to increase by 5–10 percent. Changes in temperature and precipitation and their distributions are the key drivers of climate and weather-related disasters that negatively affect Rwanda and the country's economy. Changes in the frequency of extreme weather events are expected to increase the occurrence of soil erosion and floods (Government of Rwanda, 2020a).

Rwanda is highly reliant on rain-fed agriculture, both for rural livelihoods and tea and coffee exports. It also depends on hydropower for half of its electricity generation. A rise in temperature is predicted across Rwanda in the coming years to 2050, especially during the dry seasons. An additional increase of between 0.1°C and 0.3°C is projected on top of the annual mean temperature, except for the northern region where a decrease of 0.06°C is expected (Government of Rwanda, 2020a).

Rwanda ranks 185th out of 188 countries in per capita greenhouse gas emissions. Despite its low emissions, the Global Climate Risk Index ranked it in the top-ten countries most affected by climate change as at 2018 (Rwanda Environment Management Authority, 2021).

Rwanda submitted its updated Nationally Determined Contribution (NDC) in May 2020, building on the first NDC with new policies and national plans, and reflecting subsequent work facilitated by the World Bank's NDC Support Facility in developing quantifiable targets and prioritized interventions. The updated NDC represents a more detailed and robust assessment of mitigation and adaptation measures in Rwanda, informed by in-depth analysis, improved information and data, and an extensive stakeholder-driven consultation process (Government of Rwanda, 2020a).

Rwanda's adaptation and resilience priorities build on the Green Growth and Climate Resilience Strategy adopted in 2011 with a time horizon of 2050. The strategy has 14 Programmes of

Action, each of which outlines priorities for the NDC adaptation, and will continually inform planning, resource mobilization, and implementation of the NDC between 2025 and 2030 (see Figure 3). These Programmes of Action will also help achieve climate action relevant to the SDGs. The NDC prioritizes 24 adaptation interventions in 8 key sectors. Water is at the

forefront, due to the implications of climate change and its influence on other sectors, especially agriculture. Thirty-eight adaptation indicators have been developed to be aligned with baselines and adaptation targets (Government of Rwanda, 2020a).

Figure 3: NDC Programmes of Action

Water	1	A national water security through water conservation practices, wetlands restoration, water storage and efficient water use
	2	Water resource models, water quality testing and hydro-related information
	3	Develop and implement a management plan for all level 1 catchment
Agriculture	4	Develop climate resilient crops and promote climate resilient livestock
	5	Develop climate resilient post-harvest and value addition facilities and technologies
	6	Strengthen crop management practices
	7	Develop sustainable land use management practices
	8	Expand irrigation and improve water management
	9	Expand crop and livestock insurance
Land and forestry	10	Development of Agroforestry and sustainable agriculture
	11	Promote afforestation / reforestation of designated areas
	12	Improve forest management for degraded forest resources
	13	Integrated approach to planning and monitoring for sustainable land use management
	14	Harmonized and integrated spatial data management system for sustainable land use
	15	Inclusive land administration that regulate and provide guidance for land tenure security
Human settlement	16	High density buildings and informal settlement upgrading
	17	Storm water management
Health	18	Strengthen preventive measures and create capacity to adapt to disease outbreaks
Transport	19	Improved transport infrastructure and services
Mining	20	Climate compatible mining
Cross-sectional	21	Disaster risk monitoring
	22	Establish an integrated early warning system, and disaster response plans
	23	Capacity building and development for cross-sector NDC implementation
	24	Access to finance

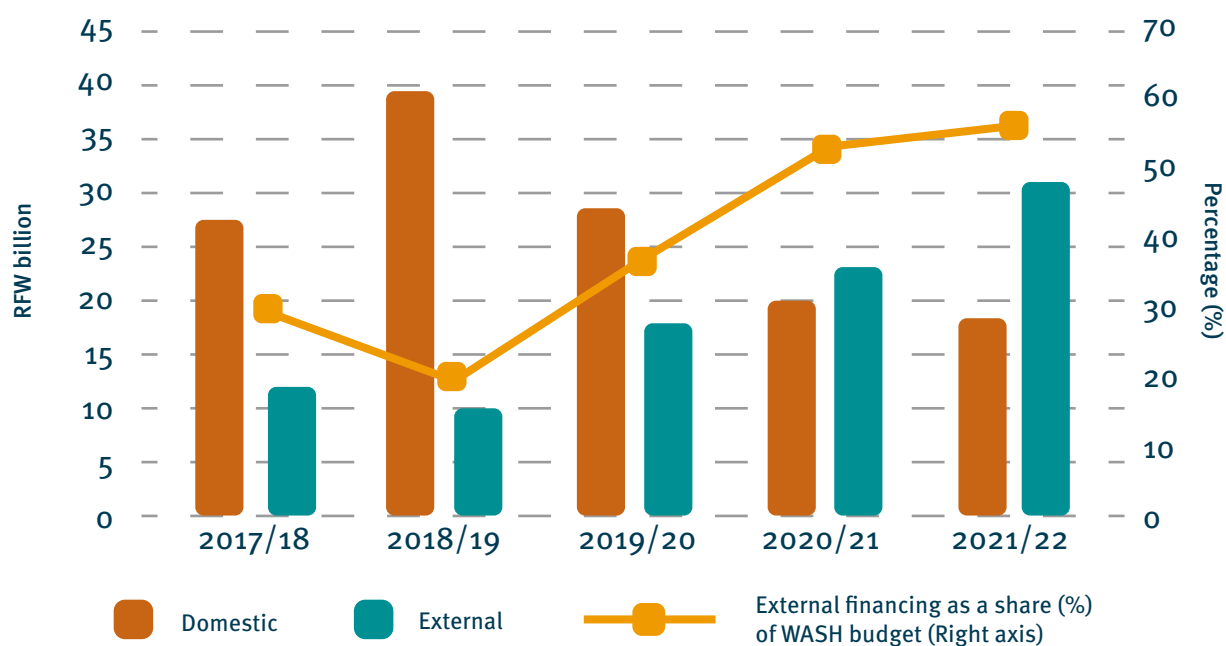
Source: Government of Rwanda, 2020a

4. Financing

Budgetary allocations to the water, sanitation, and hygiene (WASH) sector have been gradually increasing over the past five years. In the financial year 2021/2022, the WASH sector was allocated 49.3 billion Rwandan Francs (RWF) (equivalent to US\$48.2 million), up from RWF 42.6 billion (equivalent to US\$41.7 million) in the 2020/2021 revised budget.

The [Joint Sector Review forward-looking report 2018/2019](#), in reference to the midterm expenditure framework of 2018–2021, indicates a budget allocation of RWF 39.4 billion (US\$45 million) to the national urban-focused utility Water and Sanitation Corporation Limited, of which 93.4 percent is allocated to water supply and the remaining 6.6 percent to sanitation. The budget allocation for the Local Administrative

Figure 4: WASH sector financing (domestic and external)



Source: State finance laws

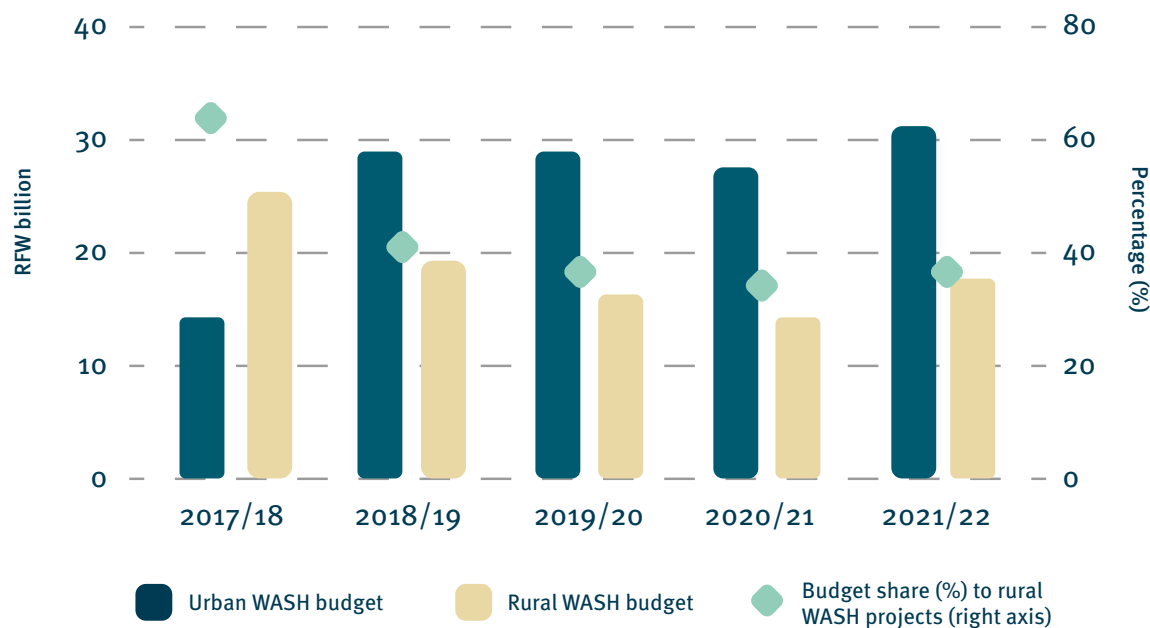
As at 2021/2022, 57 percent of the national WASH budget was externally funded (see Figure 4), driven in part by a rise in government borrowing and concessional financing, primarily from the African Development Bank. Domestic resources have, however, declined significantly for the past three years, from RWF 39.5 billion (equivalent to US\$38.7 million) in 2018/2019 to RWF 18.3 billion (equivalent to US\$17.9 million) in 2020/2021 (United Nations Children’s Fund Rwanda, 2021).

Although urban areas have significantly higher levels of basic water services than rural areas (70 percent versus 54 percent), during the 2021/2022 financial year, the share of rural budget allocations accounted for only 36.1 percent of the WASH budget (United Nations Children’s Fund Rwanda, 2021).

Entities Development Agency is RWF 3.5 billion (US\$4 million), making a total of about RWF 43 billion (US\$49 million) (Frade, 2019).

As shown in Figure 5 on the next page, expenditure on urban WASH increased from 28.9 billion RWF (US\$26.3 million) in 2019/20 to RWF 31.3 billion (US\$29.3 million) in 2021/22. While expenditure on rural WASH fluctuated between RWF 16.4 billion (US\$15.3 million) in 2019/20 and RWF 17.7 billion (US\$16.5 million) in 2021/22, and even declined to RWF 14.3 billion (US\$13.3 million) in 2020/21 (United Nations Children’s Fund Rwanda, 2021).

Figure 5: Urban vs rural WASH financing



Source: Calculated using state finance laws

The Aid Atlas report of 2021 indicates that Rwanda received US\$1.19 billion in climate funding from 2002 to 2019, of which 59.1 percent was targeted at mitigation activities, 33.7 percent at adaptation, and 7.2 percent at joint mitigation and adaptation activities. The total amount includes funding from the International Development Association (US\$501 million), the African Development Fund (US\$192 million), and the African Development Bank (US\$128 million). This funding has provided Rwanda with both on-ground investments and technical assistance that can leverage additional international climate finance (Samo et al., 2021).

To reduce bureaucracy and regulatory and reputational risks, Rwanda is investing in new policies and regulations to reduce barriers to public-private partnerships (World Bank, 2021). To achieve the SDG 6 targets by 2030, Rwanda will require US\$134 million to build and maintain universal basic water coverage and an additional US\$286 million to build and maintain safely managed water services each year up to 2030 (Frade, 2019).

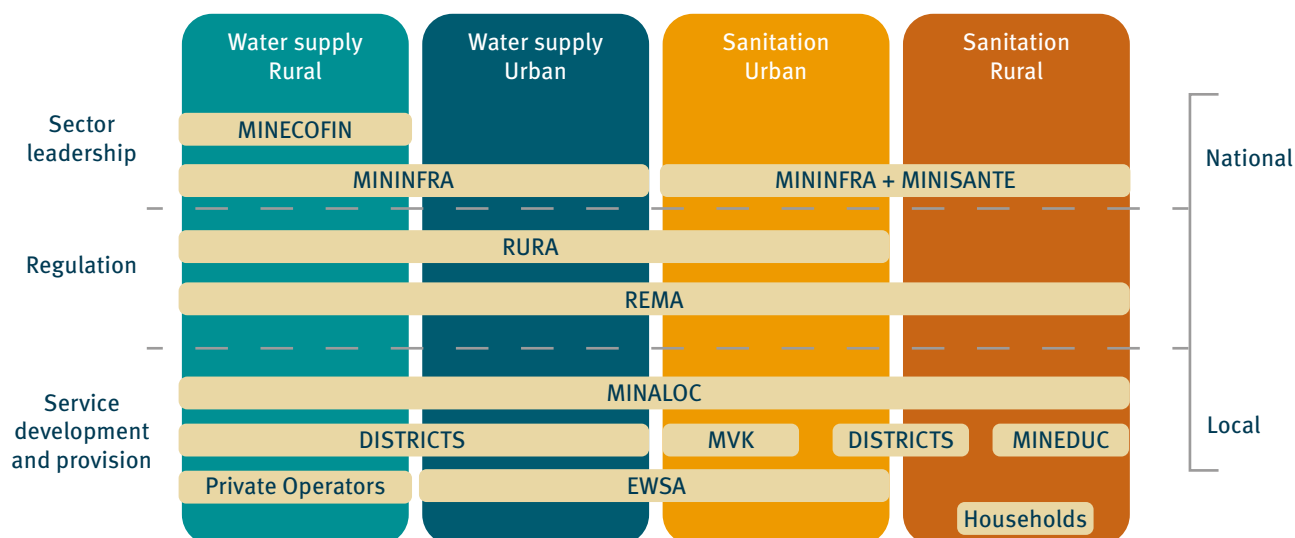
5. Governance

Rwanda has had a clear policy and institutional framework for water supply since 1992, incorporating key concerns such as decentralization, national quality standards, hygiene behaviour, dissemination of rainwater harvesting techniques, industry development, chemical and biological pollution, and private sector investment. However, sanitation, although classified as an essential service, is not as well detailed. The main institutions active in the water supply and sanitation sector and their roles are illustrated in Figure 6 (overleaf) (Water and Sanitation Program, 2011).

The governance framework for water resources management has largely improved over the last decade since the promulgation of Law No. 53/2010 establishing the Rwanda Natural Resources Authority, with a clear mandate on water

resources management. Prior to this, the institutional framework lacked a coordinating mechanism, the functions related to water resources management were not fully developed, and there was no institution with the overall authority and capacity to regulate the use and management of water resources by other sector-based institutions. Currently, water resources management is under the Rwanda Water Resources Board, as defined in the Presidential Order No. 025/01 of 18 March 2022, which determines its mission, responsibilities, organization, and operation. The Rwanda Water Resources Board falls under the category of non-commercial public institutions and is under supervision of the Office of the Prime Minister (Government of Rwanda, 2022).

Figure 6: Institutional roles and relationships in the water supply and sanitation sector



To expedite the achievement of SDG 6, the government has reinforced the target of universal access to water services in all planning documents, including the Vision 2050, the National Strategy for Transformation (2017–2024), and the Water and Sanitation Sector Strategic Plan (2018–2024). Rwanda's Vision 2050 envisages increasing the availability of renewable water resources from 670 m³ per capita per annum (as at 2015) to 1,000 m³ per capita per annum by 2035 and 1,700 m³ per capita per annum by 2050 (Government of Rwanda, 2020b). Achieving this target will require investment in extensive water resources conservation measures to leverage the abundant rainfall across the country.

Climate actions in Rwanda are based on national plans and policies, such as the NDC and the Green Growth and Climate Resilient Strategy 2011, which then form the basis for sector strategies and district development plans. The Green Growth and Climate Resilient Strategy is embedded in the National Strategy for Transformation 2017–2024: Rwanda's seven-year government programme that determines which activities are funded.

Rwanda's NDC is implemented across ministries in charge of sectoral actions, coordinated by the Ministry of Environment, and facilitated by resource mobilization overseen by the Ministry of Finance and Economic Planning and the National Fund for Environment. The Ministry of Finance and Economic Planning leads the national development planning, implementation coordination, and budgeting functions to ensure sector and district plans are aligned to National Strategy for Transformation priorities, while the Ministry of Local Government supports the coordination and follow-up on the implementation of district development strategies. At the district level, the Joint Actions Development Forums bring together all stakeholders that contribute to the delivery of the National Strategy for Transformation implemented through district development strategies (Government of Rwanda, 2020a).

Acronym definitions:

EWSA: Energy, Water, and Sanitation Authority	MINALOC: Ministry of Local Government
MINECOFIN: Ministry of Finance and Economic Planning	MVK: Kigali City Council
MININFRA: Ministry of Infrastructure	MINEDUC: Ministry of Education
MINISANTE: Ministry of Health	RURA: Rwanda Utilities Regulatory Authority
	REMA: Rwanda Environment Management Authority

Source: Water and Sanitation Program, 2011

The oversight function for implementing the National Strategy for Transformation lies with the parliament and cabinet. The Office of the Prime Minister coordinates all government programmes of the National Strategy for Transformation, with technical coordination undertaken by the Permanent Secretary's Forum and supported by the Development Partners Coordination Group. Further, Sector Working Groups consisting of government representatives, development partners, the private sector, and civil society follow up the implementation of sectoral plans and investments through Joint Sector Reviews (Government of Rwanda, 2020a).

6. Gender mainstreaming and social inclusion

Gender mainstreaming is a priority at all levels of policy and implementation for climate change and water interventions. Gender mainstreaming has its roots in the National Constitution of June 2003, which provides for higher levels of representation for previously marginalized groups such as women, youth, and people living with disabilities. The NDC monitoring framework ensures that gender-disaggregated data are captured and reported and informs programming. The influence of gender is significantly considered in WASH programming in Rwanda, including the varying roles of women and men with respect to livestock production, dairy processing, and water transportation and management (Ministry of Infrastructure, 2018).

Rwanda has ratified and adheres to international and regional conventions and declarations, each of which has a gender action plan with commitments for mainstreaming gender, environment, and climate change into national strategies and policies. A case in point is the Environmental and Climate Change Policy (2019), which enshrines gender in its principles, aiming at fostering inclusiveness. The Green Growth and Climate Resilience Strategy provides for the need to conduct a robust gender analysis assessment for informing gender-responsive approaches in its implementation (Rwanda Environment Management Authority, 2021).

Reflecting the importance of education in gender empowerment across all sectors, the National Institute of Statistics of Rwanda reports that gender parity was met for the first time by 2017, with more girls than boys enrolled in school, and that 58.6 percent of all health workers were women. At the level of high decision making, women make up above 40 percent of ministry permanent secretaries and supreme court judges, and over 30 percent of senators and parliamentary deputies chairing standing committees. Effective representation in such key legislative and decision-making roles at the national and district levels is expected to motivate and strengthen gender-transformative actions in all subsidiary sectors (National Institute of Statistics of Rwanda, 2013).

To ensure adequate attention to gender is maintained, the National Institute of Statistics of Rwanda maintains a Gender Monitoring Office and issues an annual Gender Statistics Report.

The Green Growth and Climate Resilience Strategy states the need to conduct a robust gender analysis assessment for informing gender-responsive approaches in its implementation. The National Strategy for Transformation (2017–2024) requires sectors to mainstream gender promotion and ensure women and men's equal access, control, and equitable benefits in terms of responsibility and sustainable production and consumption.

Planning in terms of water access and distribution takes into consideration the needs of both genders. Needs assessments by the government, for instance, have revealed that women bear the greater responsibility for providing water in the household, and ensuring hygiene and health care. However, women are typically under-represented in decision-making, management, training, and educational activities (Ministry of Infrastructure, 2018).

The gender budget statement adopted by the Ministry of Finance and Economic Planning is an important tool in the process of institutionalizing gender-responsive budgeting and gender-mainstreaming processes in central and local government institutions.

The Checklists for Mainstreaming Environment and Climate Change in Sectors and Districts' Development Strategies play a crucial role in the process of integrating gender, environment, and climate change at the subsidiary governance levels.

The National Fund for Environment produced and uses Gender Analysis Handbooks, which are a gender-mainstreaming package. They are complementary to the current National Fund for Environment Gender-Mainstreaming Strategy: a strategic, one-year gender action plan (2020–2021). Gender Analysis Handbooks help address gender-specific issues, including generating gender-disaggregated results as part of monitoring and reporting (Rwanda Programme Proposal to the Adaptation Fund, 2017).

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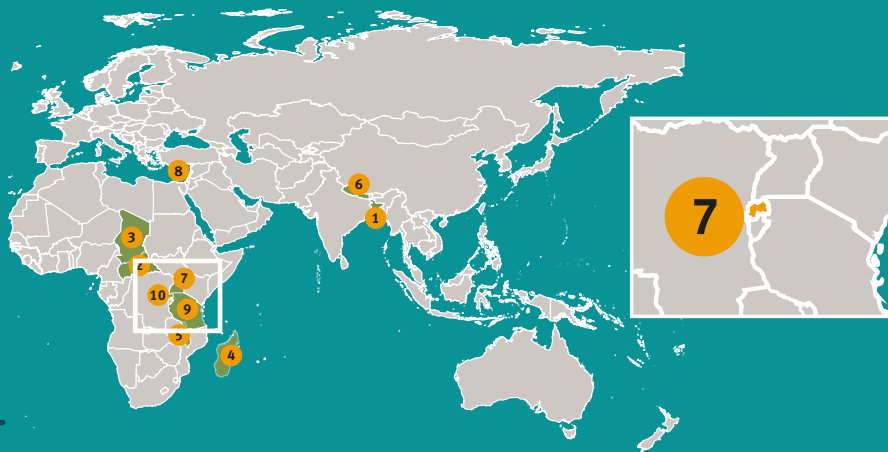
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About the Global Water Leadership (GWL) programme

Effective and equitable water management is becoming increasingly complex, and increasingly important, as climate change impacts add new uncertainty to policy decisions and financial investments. The Global Water Leadership in a Changing Climate programme (GWL) is working intensely in ten countries, bringing together key stakeholders and decision makers from two water management pillars – water resources and water and sanitation – to develop holistic, integrated policies and plans to enhance national water and climate resilience. The programme is funded by the UK Foreign, Commonwealth and Development Office (FCDO) and implemented by Global Water Partnership (GWP), the United Nations Children's Fund (UNICEF), the Sanitation and Water for All Partnership (SWA) and the World Health Organization/UNICEF Joint Monitoring Programme (JMP).



Countries in the GWL programme

1. Bangladesh
2. Central African Republic
3. Chad
4. Madagascar
5. Malawi
6. Nepal
7. Rwanda
8. State of Palestine
9. Tanzania
10. Uganda