Food and Agriculture Organization of the United Nations

Project results: Rwanda

KnoWat: Knowing water better

Towards a more equitable and sustainable access to natural resources to achieve food security

Water users and uses assessment

Rwanda is a land-locked country of 26 338 km^2, which borders Uganda, the United Republic of Tanzania, Burundi, and the Democratic Republic of the Congo. It is divided into four provinces and the capital city of Kigali, with 30 districts and a total population of nearly 13 million.

A temperate tropical climate and two main rainy seasons (February–May; September–December) determine the planting and harvesting cycles. Rainfall varies geographically, with the eastern and southeastern parts of the country receiving less precipitation (700–1 100 mm annually) than the west and northwest (1 300–1 600 mm annually).

The country is rich in water, and agriculture is the backbone of the country's economy, employing around 70 percent of the population. Known as the 'land of a thousand hills', Rwanda is characterized by a dense system of lakes, rivers, marshlands, groundwater and soil water, which are frequently replenished by abundant rainfall.

Climate variability challenges the country, ranging from changes in rainfall patterns to more extreme weather events. In addition, there is increasing pressure on natural resources (such as water and land) due to population growth, intensification of agriculture, rapid urbanization and industrialization; this has led to competition between water users and a reduction in water quality.

These challenges need to be addressed by Rwanda's water governance institutions to ensure an equitable, sustainable and climate-proof system of water allocation.

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National-level data on water users and uses

The Rwanda Water Resources Board (RWB) with support of FAO's KnoWat project and Best Associated Consultants, developed an approach to water users and uses assessment that allows information collected in the field to be entered directly into a central database from smartphones or tablets.

The approach enables the RWB, to continually update national-level data on water users and users.

RWB staff received on-the-job training in using and maintaining the software and tools for data collection and update. Data were collected in the twenty Level 2 catchments[1] in Rwanda and used to update the national database. In 2021, the results of the updated water use and users assessment were endorsed by key stakeholders in a national validation workshop.

The assessment recorded annual water use of about 608 million m^3 in 2019 compared to 499 million m^3 registered in 2017, an increase of 22 percent. This increase was partly due to higher water abstraction and partly to improved assessment methodology.

Hydropower is by far the biggest user of water resources, accounting for more than 3 382 million m^3/year. The hydropower sector contributes about 55 percent of Rwanda's capacity in energy production, particularly in the western part of the country. Water use for hydropower is considered non-consumptive.

[1] Level 2 catchments are hydrographic units defined by RWB as a basis for water resources management in Rwanda.

Water abstraction in Rwanda (2019)

- Irrigation **59.7 %**
- Domestic use **38.6 %**
- Other **1.7 %** (such as mining, industry, etc.)

Excluding hydropower, water is mainly abstracted for irrigation (363 million m^3/year, 59.7 percent), and domestic water supply (235 million m^3/year, 38.6 percent). The high abstraction by the agricultural sector can be explained by the importance of agriculture to Rwanda: agriculture contributes over 30 percent of the country's gross domestic product; about 48 500 hectares of agricultural land are irrigated.

Abstraction for irrigated agriculture is likely to increase in future, as the government plans to expand the area under irrigation to 102 281 ha by 2025. Mining, industries, fishponds and coffee washing stations account for less than 2 percent of abstractions.

2 139 major water users were identified and mapped in Level 2 catchments, of which 377 were mapped using the new approach to data collection. At the time of the assessment (2020), only 14 percent of the assessed water users held a permit.

The regularly updated information on water users and uses made possible by the new approach is an important input for sound water resources planning in Rwanda. It enables decision-makers and practitioners in public and private sectors to take informed decisions on the equitable and efficient allocation of water resources, even under conditions of climate change. It also allows water managers to identify and address actual or potential conflicts over water use in catchments.

The RWB aims to share the format of the database with other organizations to ensure consistency in acquiring and storing data on water use and users. The information is updated at the end of every year.

Further information

Use the QR code to learn more about the activities implemented in Rwanda.

www.fao.org/in-action/knowat

"Rwanda's rapid population growth and industrial development as well as the implementation of the National Strategy for Transformation (NST) are likely to increase the demand for water.

Based on current trends, the level of water scarcity will increase. For this reason, it is important for the central and local governments to have accurate data on the various users of water, water uses and sources, and to be able to monitor the extent to which water users are operating with water abstraction permits.

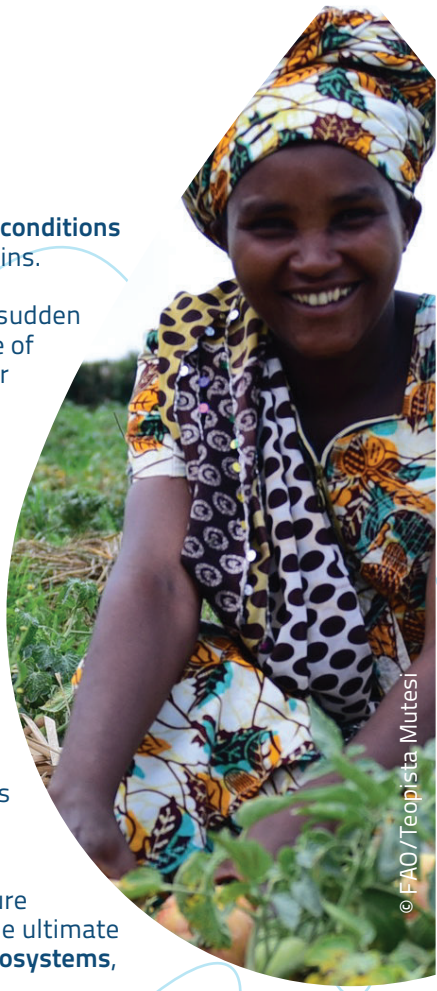
Appropriate decisions on water use management require consistent, comprehensive and reliable water use data."

Alsaad Ndayizeye, River Flood Control Specialist
Rwanda Water Resources Board (RWB)

KnoWat: Knowing water better

Towards fairer and more sustainable access to natural resources for greater food security

Rwanda, Senegal and Sri Lanka (2019–2022)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All around the world, countries are struggling to adapt their agricultural and food systems to conditions of climate change and to extreme weather events such as long periods of drought or heavy rains. Water scarcity is expected to increase as is competition for water resources among users. Smallholder farmers are particularly vulnerable to changes in water access and availability: a sudden lack of water due to drought can mean lost income and food, threatening their lives and those of their families. For these reasons, major efforts are needed to address the links between water scarcity, food security and livelihoods in our changing climate.

The KnoWat project takes an integrated approach to water resources management that includes water accounting, water productivity, water governance and water tenure assessments. **Water accounting** is the systematic study of current status and future trends in water supply and demand in a given spatial domain. **Water productivity in agriculture** signifies the ratio between yield and the water consumed by a crop. To support water accounting and productivity assessments, the KnoWat project built the capacities of key partners to apply FAO's Water Productivity Open-access Portal (WaPOR). This tool assesses water consumption in agriculture and the water productivity of agricultural production using remote sensing.

Water governance assessment looks at the broad framework of institutions, finance and the political economy. To better understand water governance processes, the project developed and tested a **new methodology to assess water tenure**, the formal and informal arrangements used to access water. The assessment of water tenure aims to understand the different relationships between people and water resources.

Enriching our knowledge around water through accounting, productivity, governance and tenure assessments helps policy and decision-makers to plan and implement **better policies**, with the ultimate goal of ensuring equitable water allocation for **better livelihoods, food security and healthy ecosystems**, even under conditions of growing water scarcity.

Federal Ministry of Food and Agriculture

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For further information, contact:

Benjamin Kiersch
Project Coordinator
Land and Water Division
Land-Water@fao.org

Joseph Bizima
National Coordinator Rwanda
FAO Representation
in Rwanda
FAO-RW@fao.org

Lamine Samaké
National Coordinator Senegal
FAO Representation
in Senegal
FAO-SN@fao.org

Thushara Ranasinghe
National Coordinator Sri Lanka
FAO Representation
in Sri Lanka
FAO-LK@fao.org

https://www.fao.org/in-action/knowat