



KENYA'S EXPERIENCE IN INTEGRATED WATER RESOURCES MANAGEMENT

Workshop on Mainstreaming of Environmental Flows Into Integrated Water Resources Management

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Contents



- ▶ Major River Basins in Kenya
- ▶ Importance of the Key Rivers in Kenya
- ▶ Policy and Institutional Framework on River Basin Management
- ▶ Challenges in Management of Water Resources
- ▶ Interventions to Improve the Status of the River Basins

Physical Features



LOCATION

- Kenya is located on the eastern part of Africa
- Borders Ethiopia and South Sudan in the north, Uganda in the west, Tanzania in the south, Somalia and the Indian Ocean in the east.
- Coverage area; 582,646 km² (11,230 km² water and 571,416 km² land).

TOPOGRAPHY

- Ranges from glaciated mountains (Mt. Kenya) to semi desert landscape.
- The elevation varies greatly from sea level at the Indian Ocean to 5,199m at the Peak of Mount Kenya.

RIVERS

- Kenya is endowed with many rivers. The major ones are Athi, Tana, Nzoia, Mara, Nyando, Sondu and Ewaso Ng'iro.
- Water towers; >80, 18 gazetted.
- Major Water Towers are; Mau Forest Complex, Mt. Kenya, Aberdare Ranges, Mt. Elgon, Cheranganyi hills.

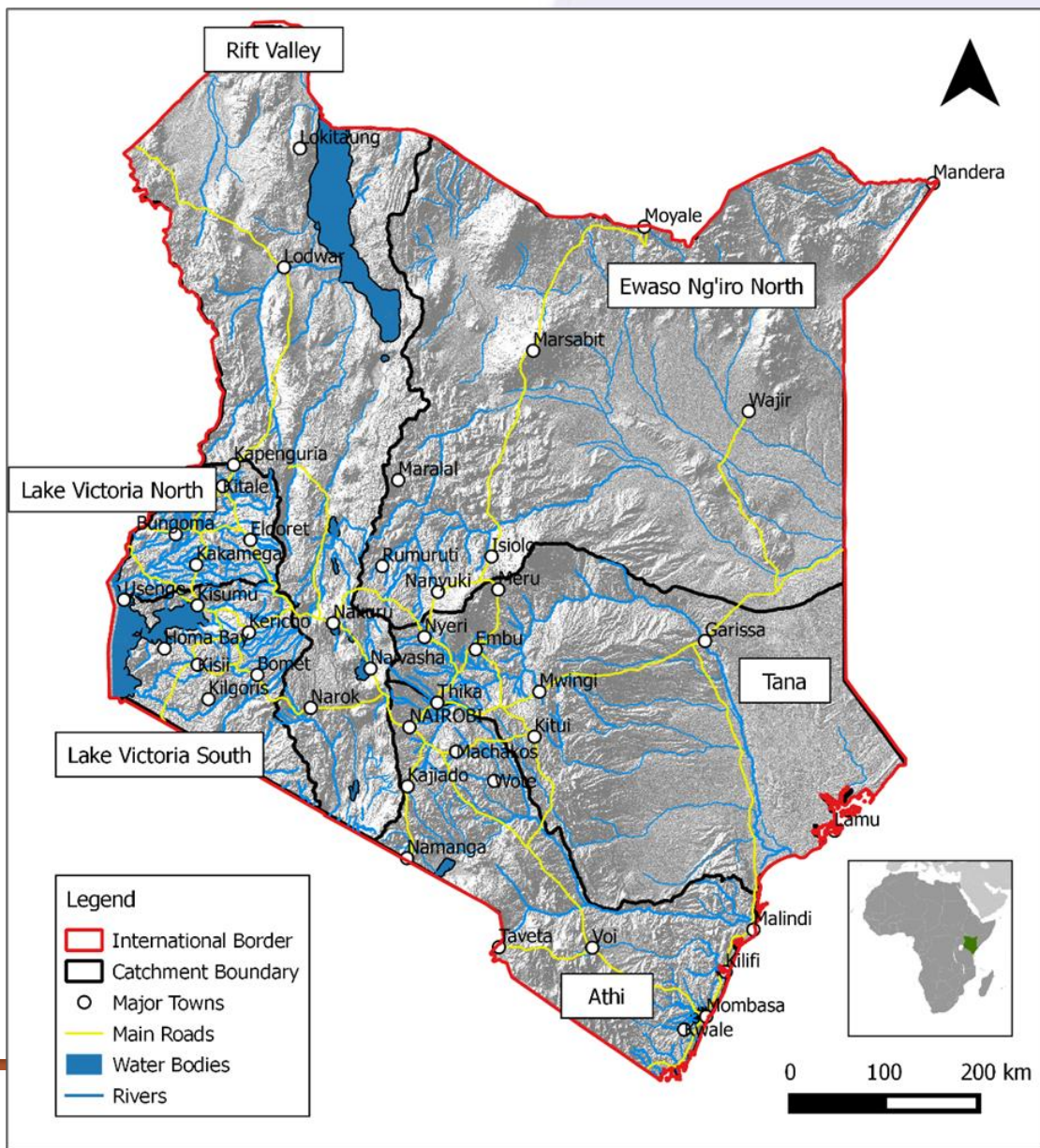
CLIMATE

- Rainfall (Two seasons)
 - Long rains (March – May) and short rain (October - December).
 - Mean annual rainfall 680 mm.
 - It varies from about 200 mm in the ASAL to about 1,800 mm in the humid zone.





Major River Basins in Kenya



- Kenya has a total area of 582,646km²
- 5 River Basins:
 - Ewaso Ng'iro North - 210,223km² (25% of Kenya)
 - Rift Valley - 130,452km²
 - Tana - 126,026km²
 - Athi - 58,639km²
 - Lake Victoria - 31,734km²

Importance of Key River Basins in Kenya



Domestic

About 30% of the country's population resides in urban areas. Domestic water demands are rapidly increasing due to population growth, urbanisation and the expansion of formal water supply systems. 63% of Kenyans have access to drinking water sources, including 22% with access to piped water.



Wildlife and Tourism

Kenya is rich in wildlife habitats, including the famous Masai Mara annual migration, which is a large tourist attraction. There are several National Parks and Game Reserves where tourists flock to see wild animals, reptiles and bird species. Tourism is the largest contributor to the country's GDP. Other tourist attractions include the coastal towns of Mombasa and Malindi.



Agriculture

Agriculture is a major economic sector, and more than one third of the agricultural produce is exported. The agricultural sector includes cash crops, horticulture, livestock and fisheries. Agriculture is mainly rainfed, and maize, wheat, beans, tea, coffee and potatoes are the main crops grown. Pastoralists raise livestock in the arid/semi-arid lands, mainly beef, cattle, sheep, goats, camels, pigs and poultry.



Energy

The main energy sources are biomass (wood fuel and charcoal), petroleum and electricity. Electricity is mainly generated by geothermal energy and hydropower. There are currently 15 hydropower stations across the country (combined total installed capacity of about 780 MW), 10 of which are in the upper Tana River catchment.



Industry and Mining

Industrial activity is concentrated in the large urban centres of Nairobi, Mombasa and Kisumu. Industries include food-processing, beer production, small-scale consumer goods production and oil refining. Mining is a small sub-sector of the industrial sector, with small deposits of gold, limestone, soda ash, rubies and garnets being mined.



Environment

Kenya has environmentally sensitive areas, including water towers, forests, wetlands, lakes and parks. These areas are currently threatened by human encroachment, and need to be conserved in order to protect the natural ecosystems and ensure the sustainable use of the available water resources.

Policy and Institutional Framework on River Basin Management in Kenya



The **Constitution of Kenya 2010** acknowledges access to clean and safe water as a basic human right.

*It states that, 'every person has a right to a **sustainable, clean and healthy environment** and to **clean and safe water** in **adequate quantities**.'*

The **Water Act 2016** provides for the **Regulation, Management** and **Development** of water resources, water and sewerage services; and for other connected purposes.

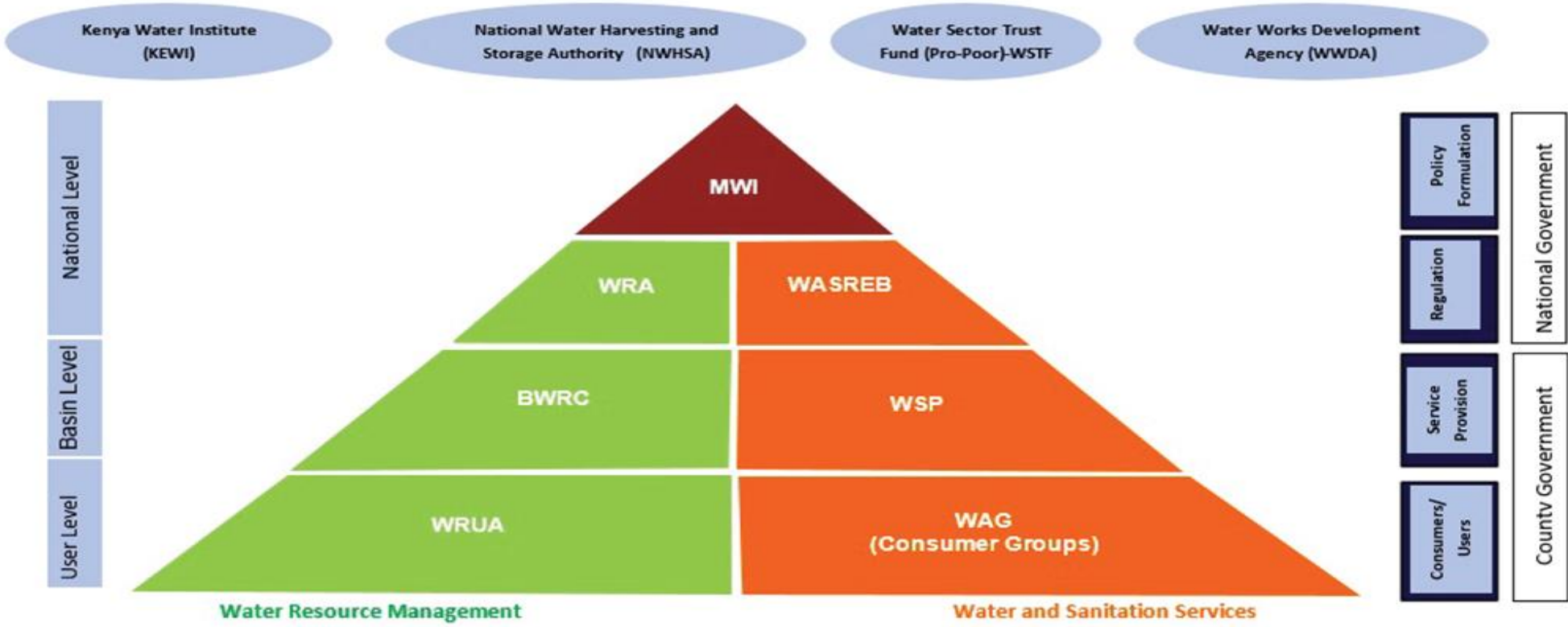
- *The Act aligns the water sector (and the Water Act 2002) with the Constitution's primary objective of devolution.*
- *Recognizes that water related functions are a shared responsibility between the National Government and the County Governments.*

Water Resources Management Rules 2007 were based on the **Water Act 2002** and gives details on water allocation and water use permits.

- *will be updated to align with the Water Act 2016*



The Kenya Water Sector– Institutional Set-Up (Water Act 2016)



Water Resource Management

Water and Sanitation Services

ABBREVIATIONS

MWI:Ministry of Water and Irrigation
BWRC:Basin Water Resources Committee
NWHSA: National Water Harvesting and Storage Authority
WAG:Water Action Group
WASREB: Water Services Regulatory Board

WRA:Water Resources Authority
WRUA:Water Resources User Association
WSP:Water Service Provider
WWDA:Water Works Development Agency

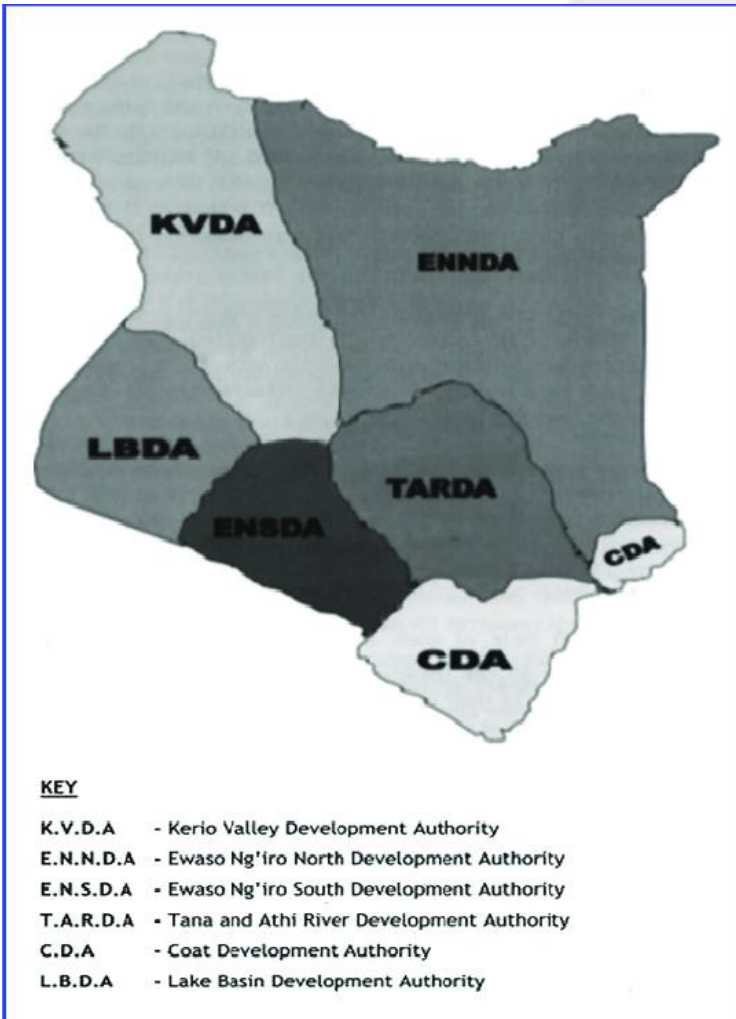
Institutions and Their Responsibilities



Institution	Responsibility
Ministry of Water and Irrigation	Policy formulation, coordination
Water Services Regulatory Board (WASREB)	Regulation of water services
Water Works Development Agency	Asset development (national)
Water Sector Trust Fund (WSTF)	Pro-poor basket fund of water sector
Water Resources Authority (WRA)	Regulation of water resources
Water Resources Basin Committees	Management and development water resources with Water Resources Users
Water Service Providers (WSPs)	Provision of Water Services (county or cross county)
Water Harvesting and Storage Authority	Water storage and flood control
Kenya Water Institute (KEWI)	Training and research

Institutions and Their Responsibilities

Regional Development Authorities



Formed in the early 1970s to:

- Address the challenges of achieving **a holistic and integrated development of natural resources** within a sector based development approach.
- Plan and coordinate integrated river basin based development.

This approach was informed by the success then of Tennessee River Development Authority In the USA

Responsibilities:

- To ensure close **co-operation** between all agencies concerned with the **abstraction** and **use** of water within the area
- To **collect, assemble** and **correlate** all such data related to the use of water and other resources within the area as may be necessary for the **efficient** planning of the area
- To facilitate the **construction** of any works necessary for the **protection** and **utilization** of the **water** and **soils** of the Area.
- iv. etc.

Challenges in the Management of Water Resources in Kenya



Available Water Resources by basins (Units in MCM/yr.)

Catchment Area	Area (sq.km)	2010	2030	2050
LVNCA	18,374	4,742	5,077	5,595
LVSCA	31,734	4,976	5,937	7,195
RVCA	130,452	2,559	3,147	3,903
ACA	58,639	1,503	1,634	2,043
TCA	126,026	6,533	7,828	7,891
ENNCA	210,226	2,251	3,011	1,810
Total	575,451	22,564	26,634	28,437

Water Demand per Region (Units in MCM/yr.)

Catchment Area	Area (sq.km)	2010	2030	2050
LVNCA	18,374	228	1,337	1,573
LVSCA	31,734	385	2,953	3,251
RVCA	130,452	357	1,494	1,689
ACA	58,639	1,145	4,586	5,202
TCA	126,026	891	8,241	8,476
ENNCA	210,226	212	2,857	2,950
Total	575,451	3,218	21,468	23,141

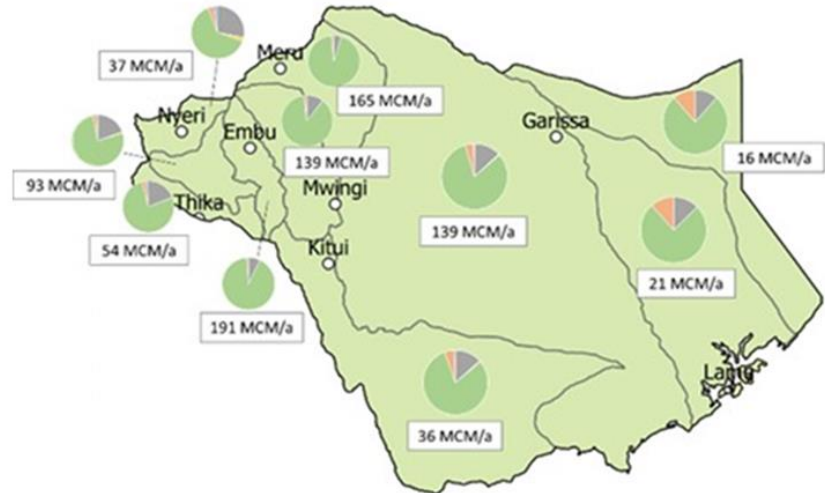
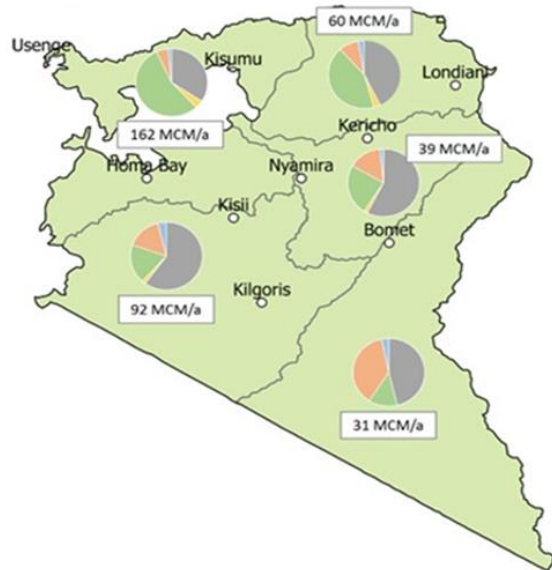
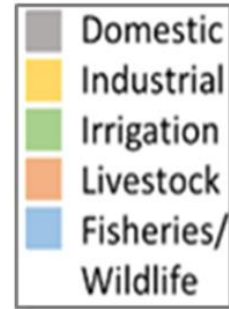
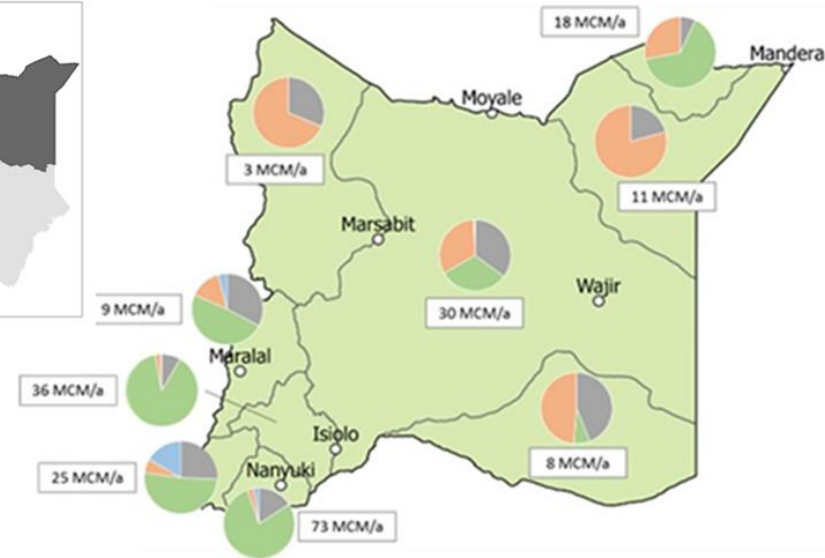
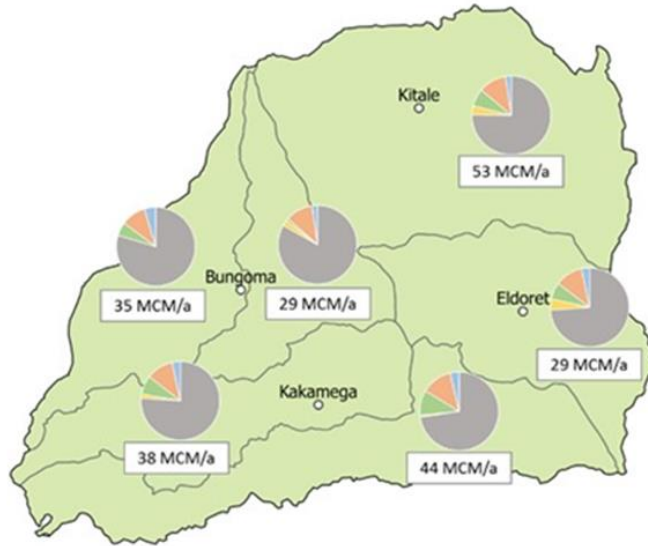
With an estimated population of 48 million, Kenya faces enormous challenges in the management of its limited water resources.

The challenges include:

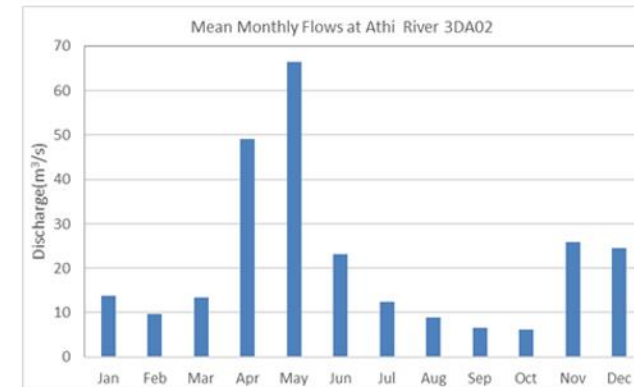
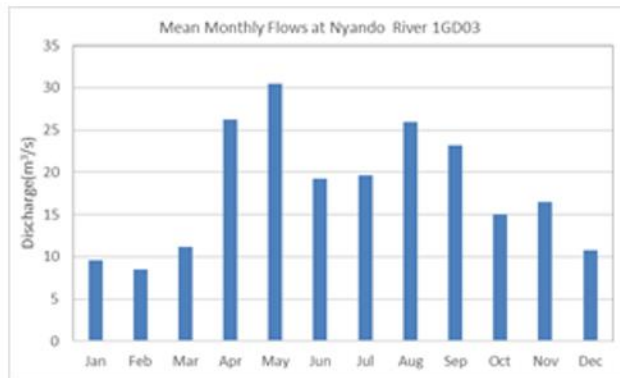
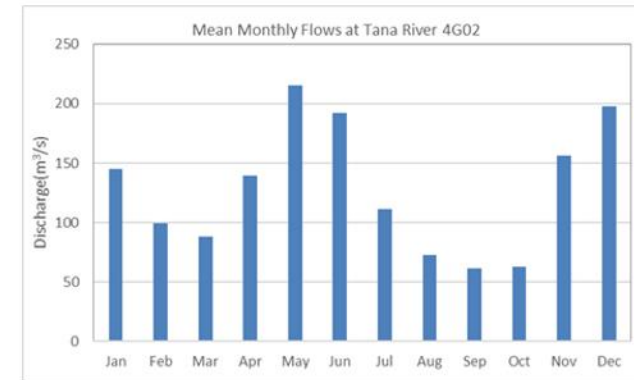
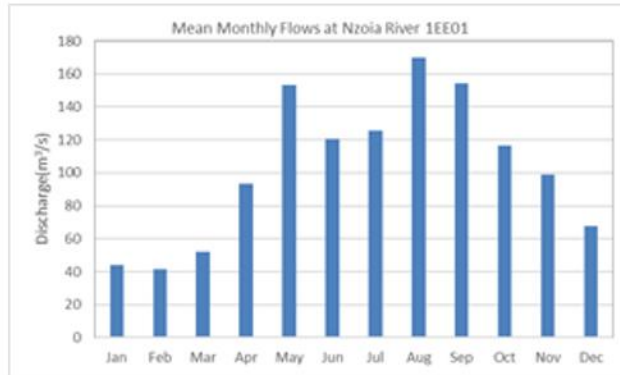
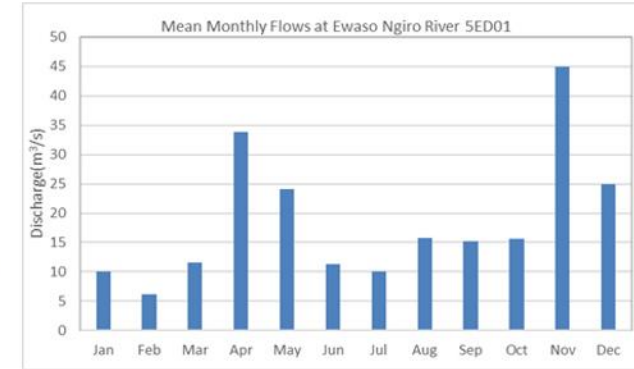
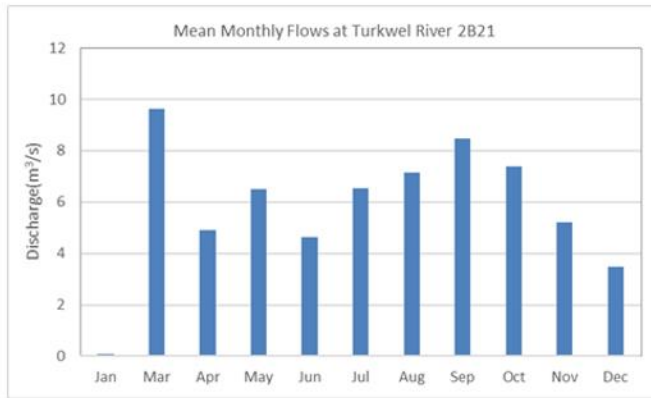
- water scarcity and variability (in space and time)
- water pollution (point and non-point)
- catchment degradation (Encroachment of water sources)
- Impacts of climate change (Severe floods and Droughts)

The magnitude of the challenges and the severity of the water crisis facing Kenya cut across most sectors of the economy; hence, making water resources management a high priority

Water Demand



Flow Variability





Interventions to Improve the Status of River Basins in Kenya



Sub Catchment Management Plans (SCMPs)

Objectives:

- To improve management of water and land resources for enhanced livelihoods.
- Improve the ability of the sub-catchment to provide ecosystem services.
- Improve the governance of land and water resources by promoting stakeholders participation.

Major Outcomes

- 380 Sub Catchment Management Plans developed
- 150 implemented. *Activities:* Riparian pegging, On-farm and Off-farm Soil conservation, Spring protection, Desilting of water pans, Catchment conservation (tree planting), Establishment of water resources monitoring network, Determination of reserve flows, livelihood activities.

Partners

Coordinated by: **Water Resources Authority.**

Stakeholders: Water Resource Users Associations, Government Agencies (e.g. National Environmental Management Agency, MoAL&F, KWS, KFS, WSB), County Government, local NGOs & Civil Right Groups

Projects supporting Implementation of SCMPs /River Basin Improvement Programs:

- **Kenya Water Security and Climate Resilience Project** – To improve water security, strengthen water and climate risk investment planning, preparation and implementation.
- **Nairobi River Basin Rehabilitation Program** - To rehabilitate, restore and sustainably manage the Nairobi River Basin in order to provide improved livelihoods and enhance environmental quality.
- **Mau Mara Serengeti (MaMaSe) Sustainable Water Initiative** - To improve water safety and floodplain management in the Mara River Basin in support of poverty reduction, sustainable economic growth, and ecosystem conservation.
- **Upper Tana Nairobi Water Fund (UTNWF)** - A well-conserved upper Tana catchment with improved water quality and quantity and to enhance ecosystem services, food security and livelihoods.



Recommendations on Next Steps

- i. Upscale implementation of watershed management activities to the remaining 230 sub catchments with SCMPs.
- ii. Introduce Environmental Flow establishment in the SCMPs.
- iii. Support formation of Water Resource Users Associations (WRUAs) in all water resource hotspot areas in Kenya.
 - 700 Water Resource Users Associations have been formed in Kenya out of the Optimal 1,237.



Thank You