Regional Centre on Groundwater Resources Education, Training & Research

OASIS OF GROUNDWATER KNOWLEDGE

Activities Geared Towards the Realization of SDG 6 at RCGW

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RCGW: Regional Centre on Groundwater Resources Education Training & Research

RCGW Background

- Cognizant of the important role for groundwater in economic development in the country, the Government of the Republic of Kenya established the Centre (RCGW) through a Legal Notice No. 252 of 18th December, 2015 under the State Corporations Act Cap 446 of the Laws of Kenya.
- The Centre is a State Corporation under the Ministry of Water, Sanitation and Irrigation.

Our Values

INTEGRITY | PROFESSIONALISM | INNOVATIVENESS | SUSTAINABILITY

Office & Mandate of the Centre

Mapping of Aquifer Systems

GROUNDWATER ASSESSMENT

Initiate and Conduct Groundwater Research

Carry out hydrogeological and geophysical surveys to establish aquifer extend and characteristics

Drilling exploratory wells to ground truth and confirm research findings

Useful GW Reports & Maps

GW Conservation and Governance

GROUNDWATER MANAGEMENT

Undertake & Promote GW Sustainability Activities

Carry out water and soil conservation activities within the aquifer areas & adopt good governance

Planting trees and other soil cover vegetation to slow surface flow and increase infiltration

Increased GW Accessibility

GW Training and Public Awareness

CAPACITY BUILDING

Design & Develop Groundwater Training Materials

Carry out public awareness drives & design short & long term courses to build capacity

Training groundwater professionals and the general public on tailored Groundwater topics

Increased GW Awareness

Providing GW Technical Services

CONSULTANCY SERVICES

Perform Groundwater Technical Services

Carry out technical services on groundwater resources for socio economic benefit

Drilling boreholes, supervision, aquifer/well pump testing, managed aquifer recharge

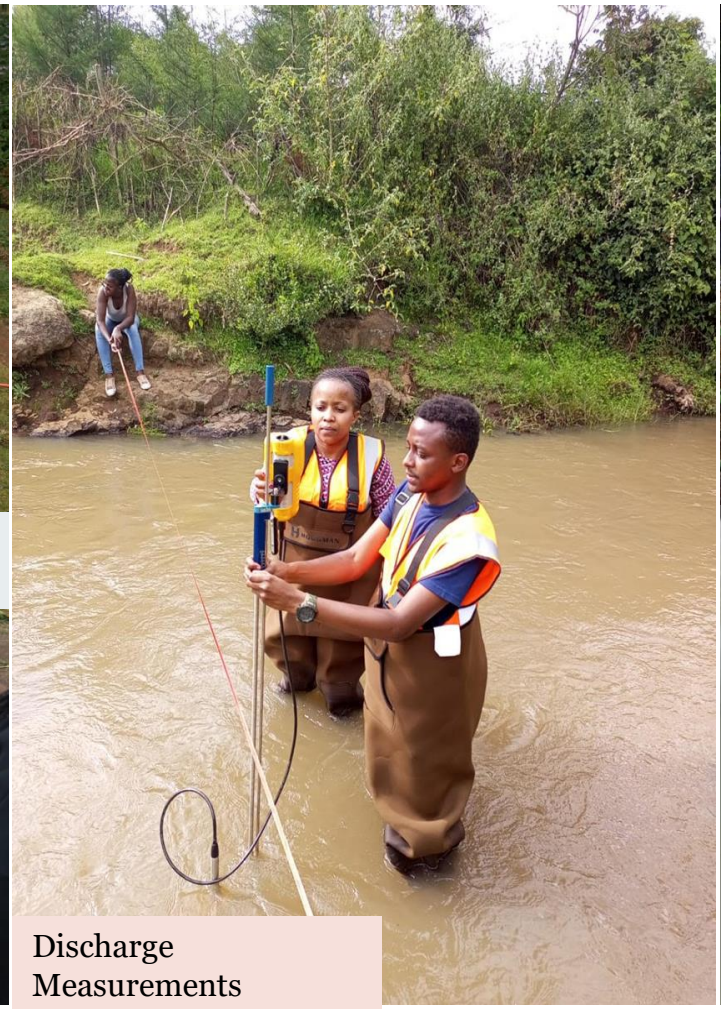
Improved Cost Benefit Analysis

How we endeavour to achieve our Mandate……

1. Field & Laboratory Research

Geophysical Survey

WRL Measurements

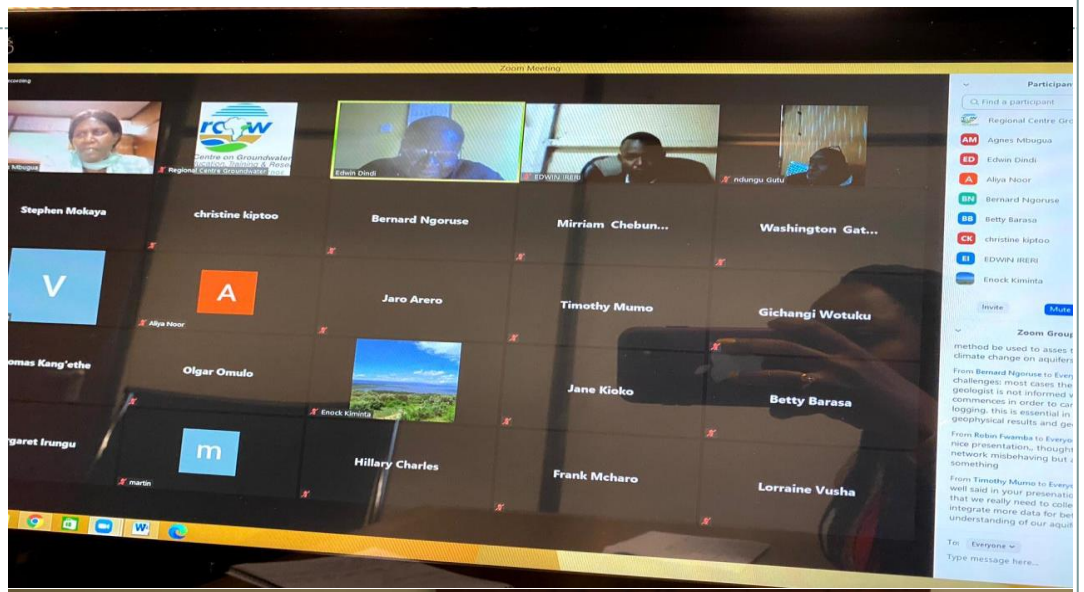


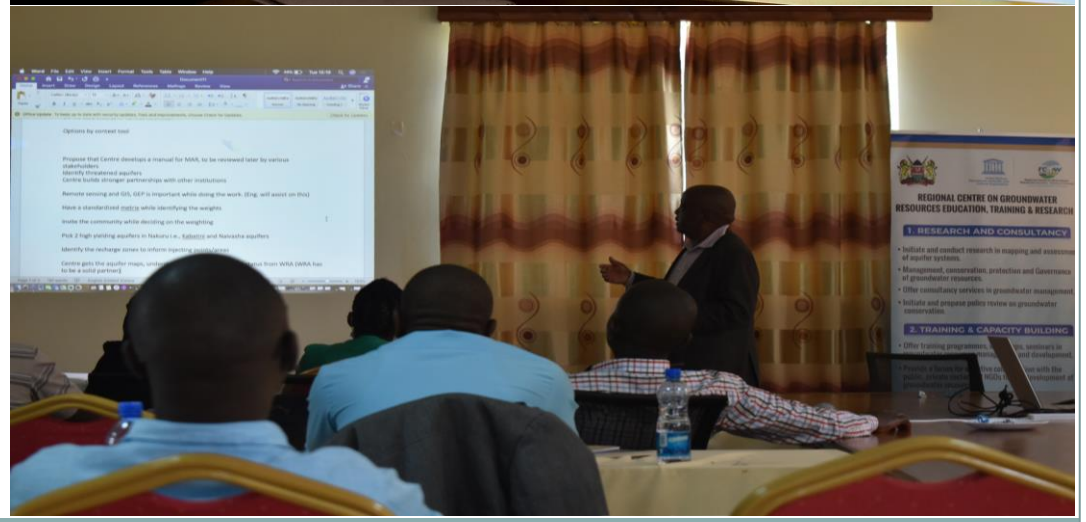
Discharge Measurements

Water quality Sampling

Collected samples

2. Training & Capacity Development





Internal/External Capacity building entails:

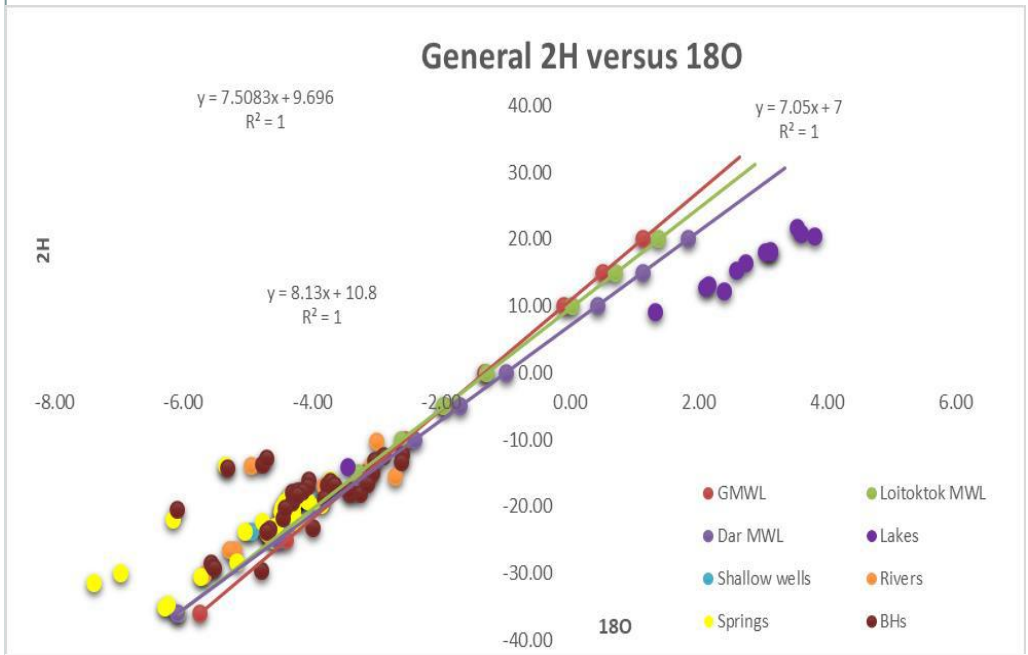
- ✓ Training Workshops for Professionals (Local & Abroad)
- ✓ Public awareness raising drives (Virtual & Physical Sessions)
- ✓ Internships and attachments
- ✓ Adoption of new/appropriate technologies in GW

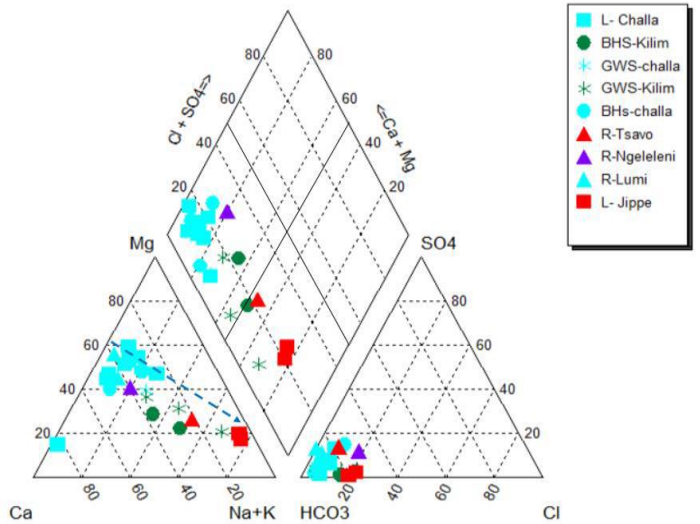
3. Promoting Groundwater Resources Mgt.

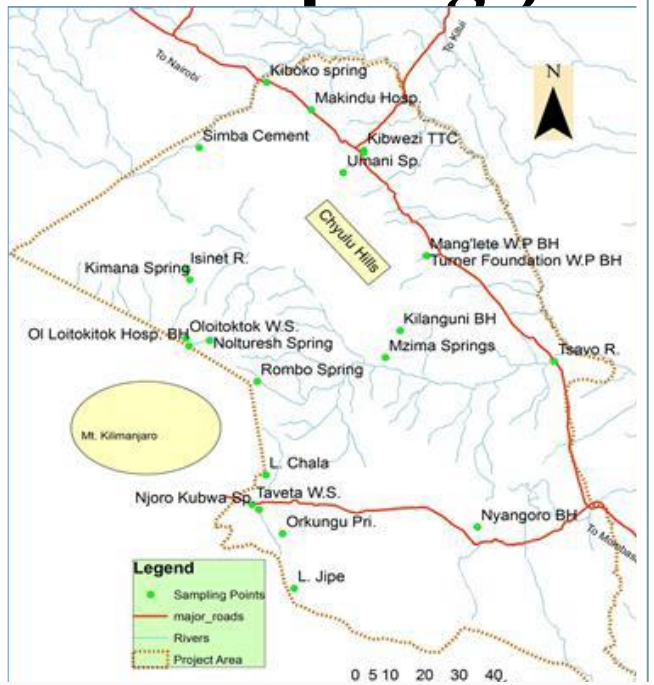
Public Awareness creation on groundwater resources sustainability through tree planting exercises

Isotope Hydrology Results

Evaluation of groundwater/surface water interaction of Kilimanjaro aquifer system (Loitokitok, Chyulu hills, Taveta and Mzima springs)







The research was in collaboration with International Atomic Energy Agency (IAEA). From the research work and owing to the use of nuclear techniques (i.e., Isotope hydrology) in enhancing climate change adaptation and resilience of the vulnerable groups such as pastoralists, water sector was **nominated in Sepetember 2022 for filming to showcase climate change adaptation in water resource use during Conference of Parties (COP) 27 in Egypt**.

Water Quality Assessment & Mapping

Timau Sub-catchment, Ewaso Ng'iro North Basin

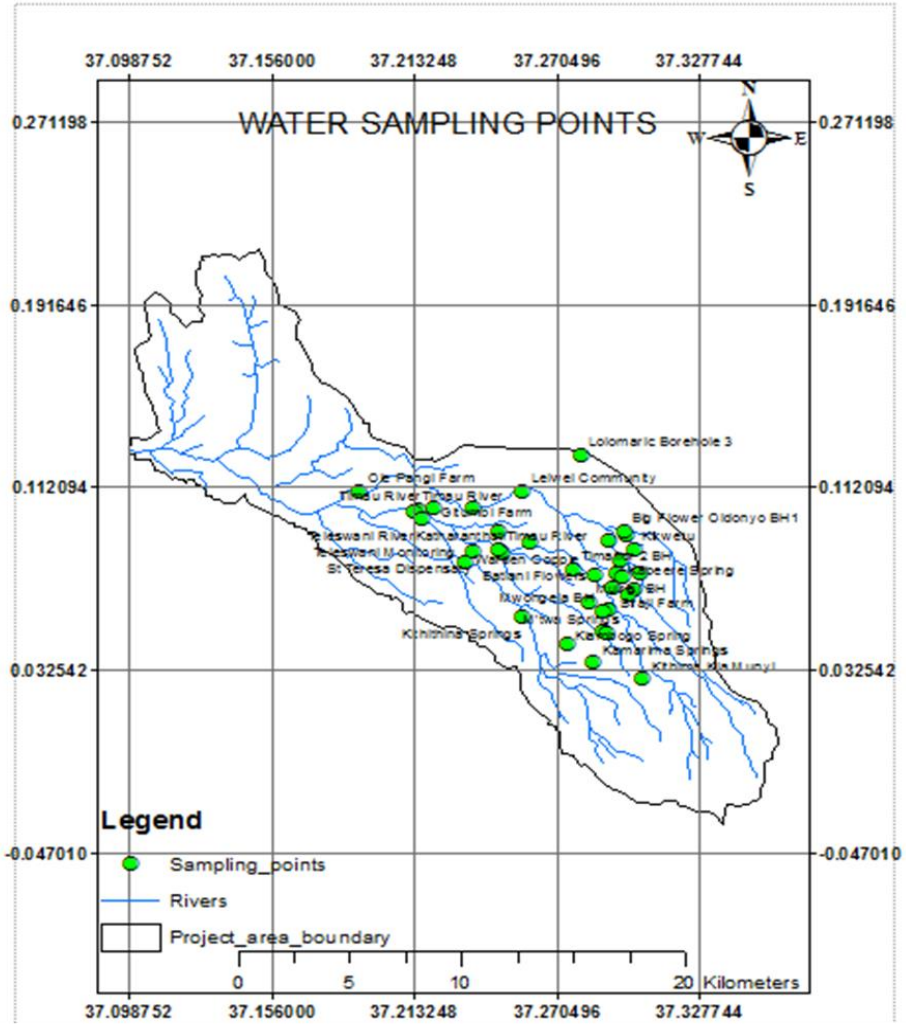
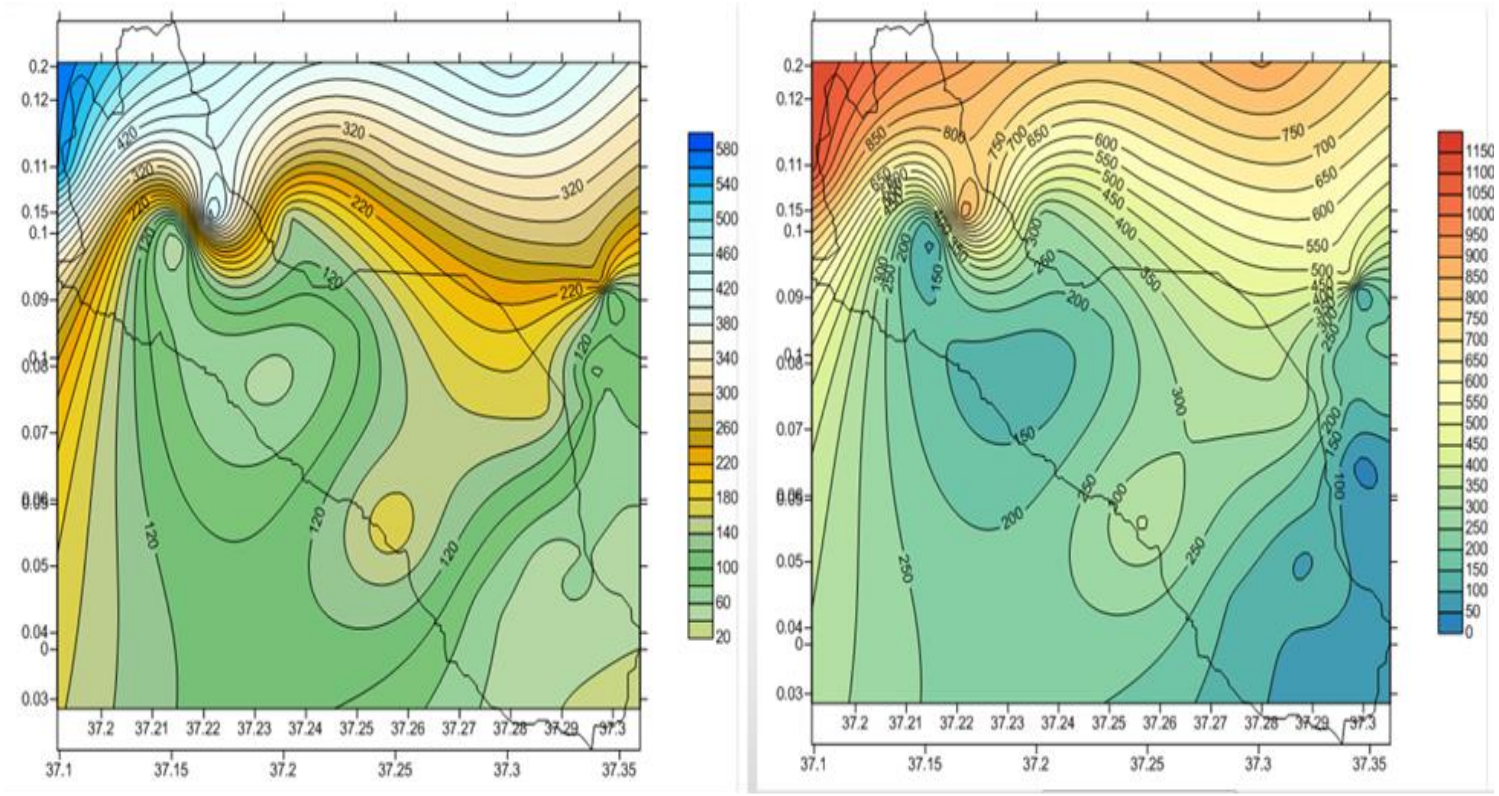


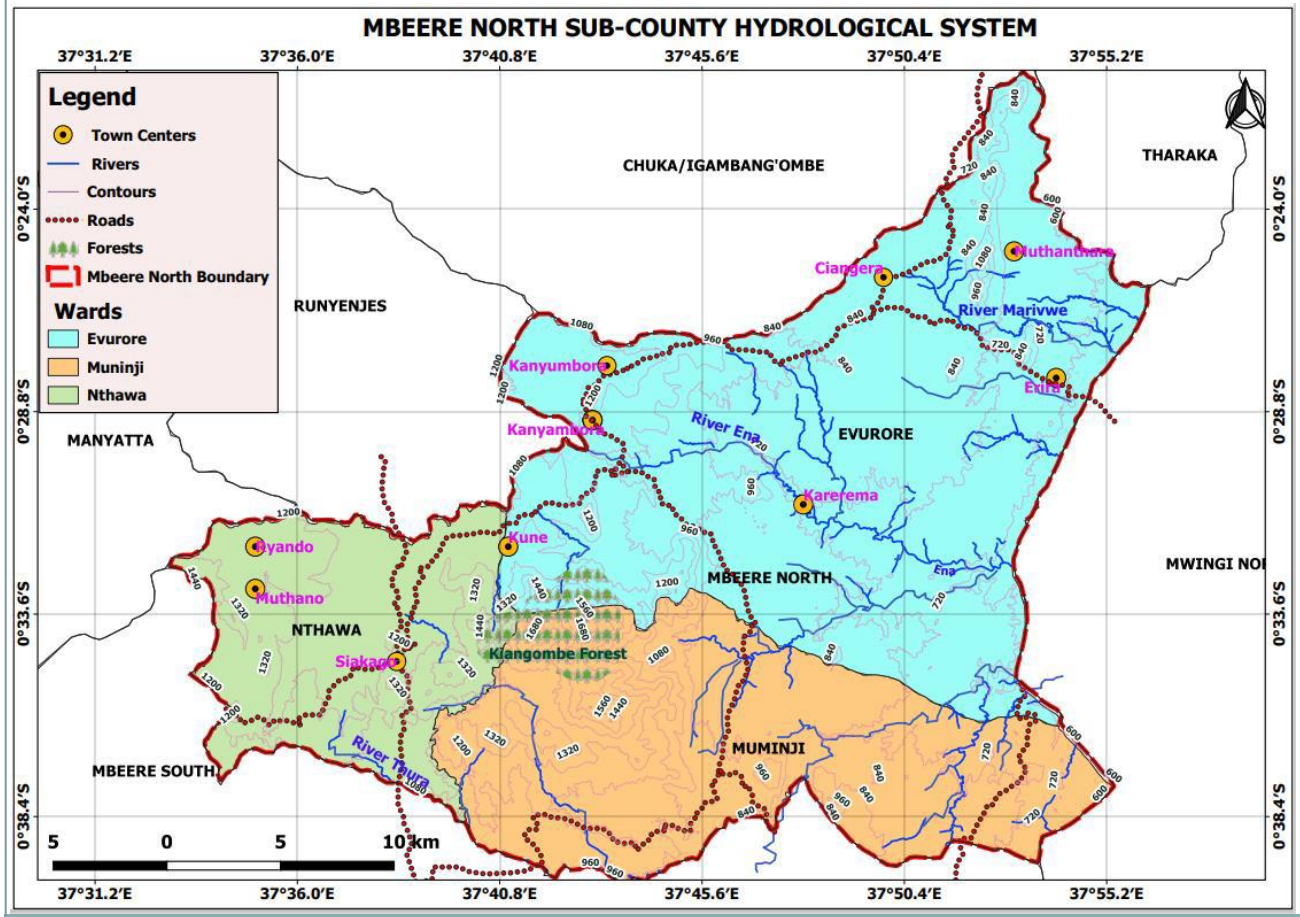
Figure : Sampling Points

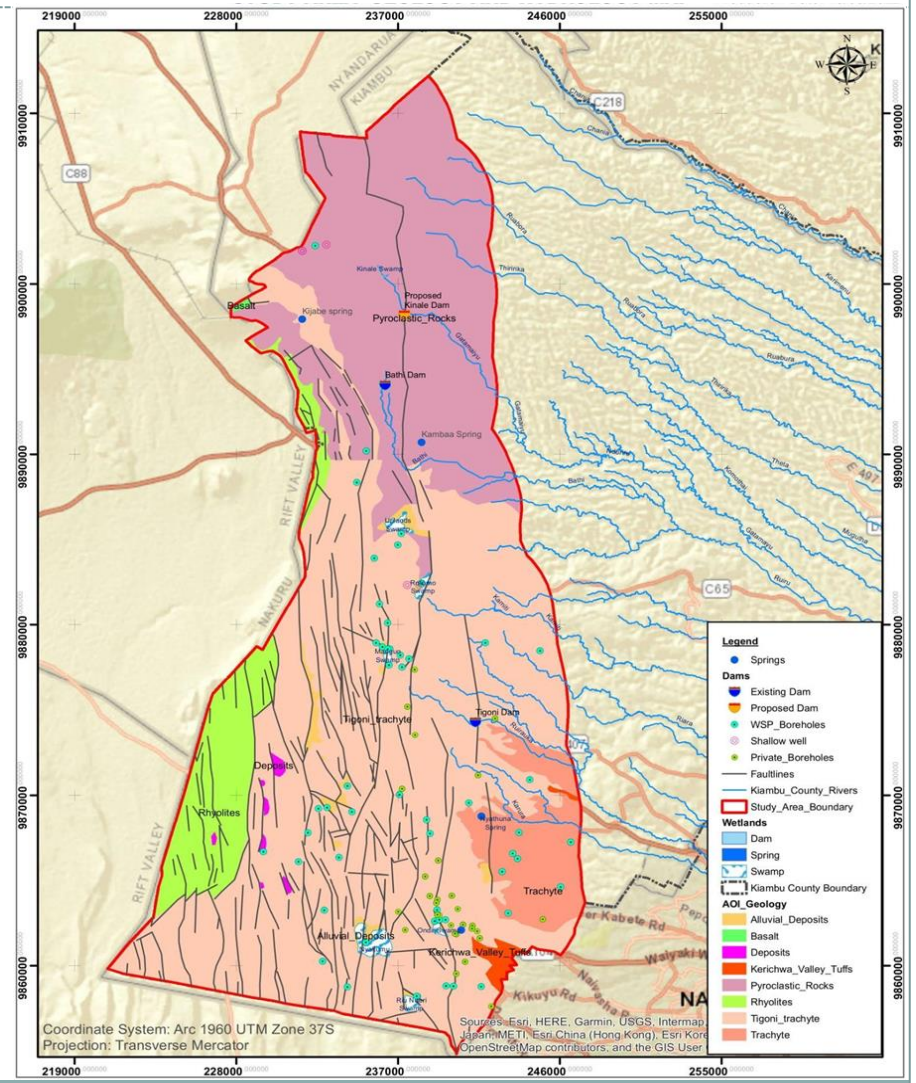


Relationship between Total Dissolved solids (TDS) and Electrical Conductivity (EC) in ground water.

Groundwater Sustainability Studies

- Study in Kiambu County (Kinari, Limuru And Kikuyu Areas)
- Study in Embu County (Mbeere North Constituency)





RCGW Focus Areas……

OUR FOCUS AREAS

Artificial Recharge

Groundwater resources suffer sustainability challenges due to over abstraction or groundwater mining. This challenge can partly be addressed through Managed Aquifer Recharge - MAR

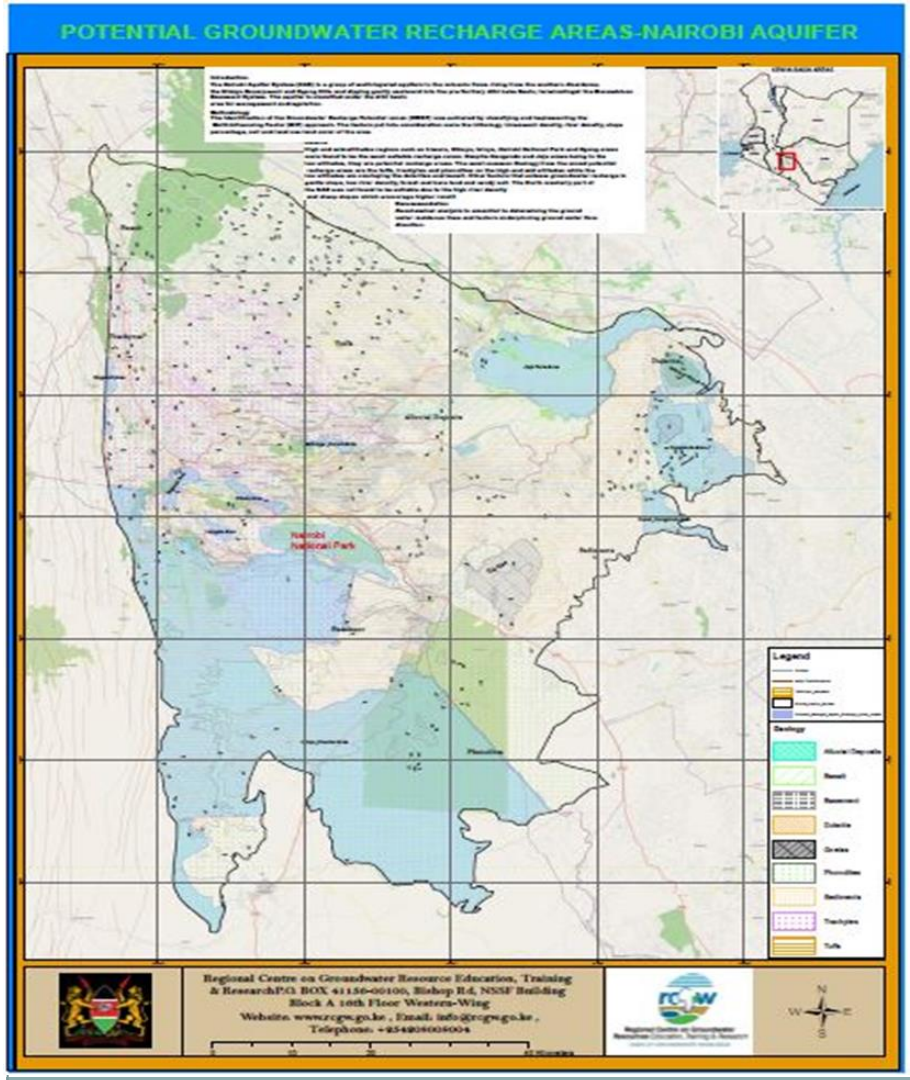
Water Reclamation

Municipal wastewater (sewage) may be treated to a quality level acceptable for reuse for a variety of purposes. Reclaimed wastewater may be injected into groundwater systems through MAR interventions.

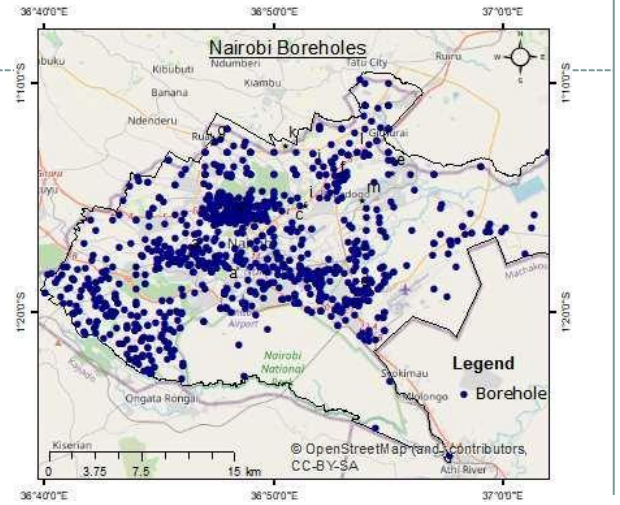
Desalination

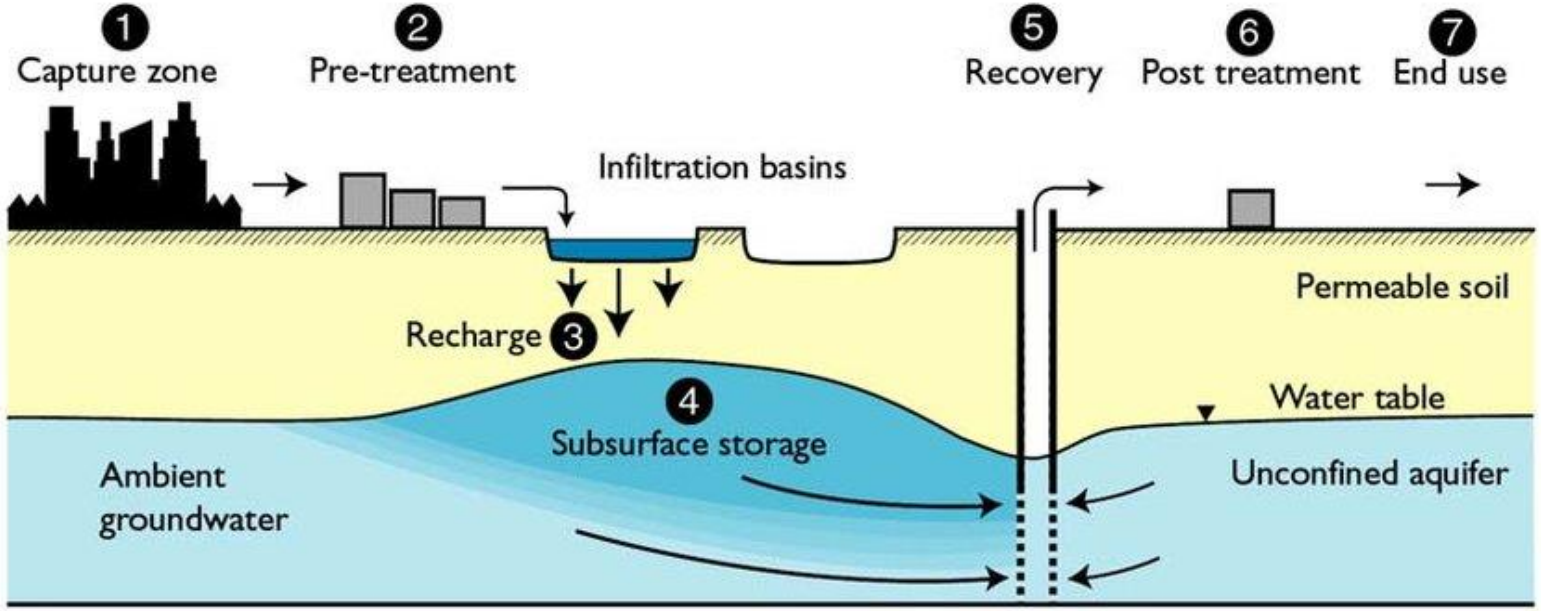
Saline water (especially from local aquifers in Arid areas) can be desalinated to produce water suitable for human consumption or irrigation. Our interest in desalination is focused on cost-effective provision of fresh water for Turkana Aquifers.

a) Promoting MAR Technology in Kenya

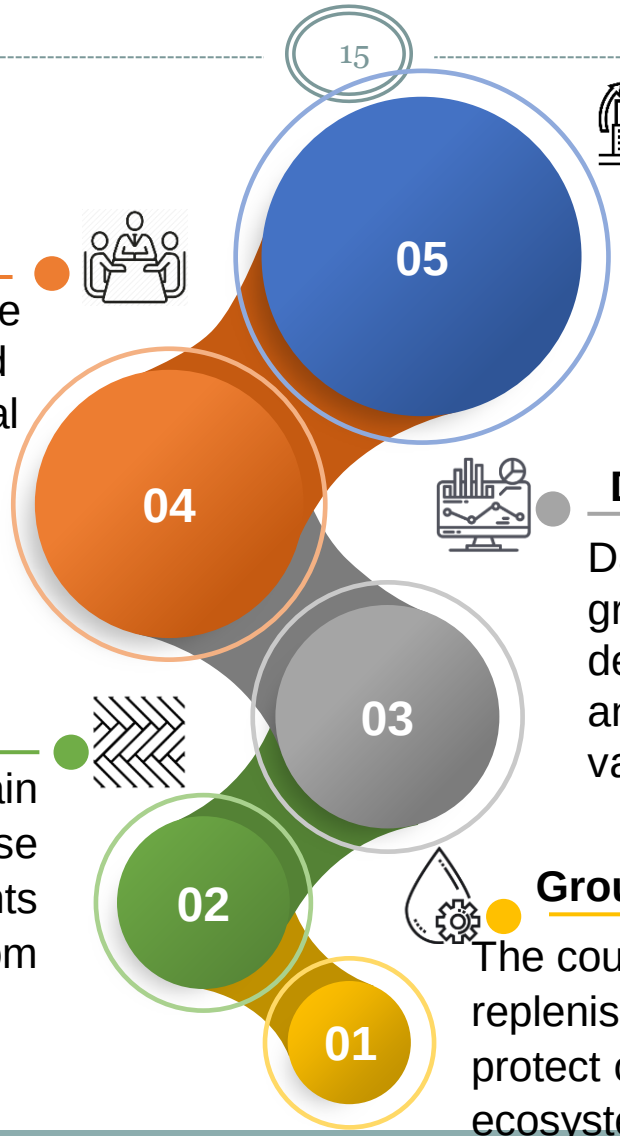


- Nairobi MAR Concept
- Nakuru MAR Concept
- Coast MAR Concept





Need for MAR Adoption



Advocacy/Stakeholder Engagement

Involvement of all stakeholders, including state and non state agencies/regulators/WSPs, and consumers to establish and maintain structural and non structural MAR infrastructure.

Urbanization/Pavements Reduce Infiltration

Naturally, groundwater is "recharged" by rain infiltrating down into the aquifers. But land use change, storm water drains and the pavements associated with urban growth divert water from important recharge zones.

Environmental Sustainability

MAR technology can help overcome climate vulnerability and contribute to a more water-secure future through conservation measures, monitoring and control of abstraction.

Data-Driven Decision Making

Data collected and analyzed has empowered groundwater duty bearers to make data-driven decisions. Historical data reports, real-time analytics, modelling and visualizations provide valuable insights into water abstraction patterns

Groundwater: A Finite Endangered Resource

The country is using groundwater faster than nature can replenish it. We have a responsibility to take steps now to protect our groundwater resources and conserve our ecosystems for now and the future.

Trip to Ondiri Wetland/Swamp

- Friday Afternoon
- Is a protected wetland
- Ondiri Wetland covers 3,713,549 square feet and is a source to 40 springs, which provide water to the local community.

END OF PRESENTATION

THANK YOU

All MAR Stages: Aiming Right

01

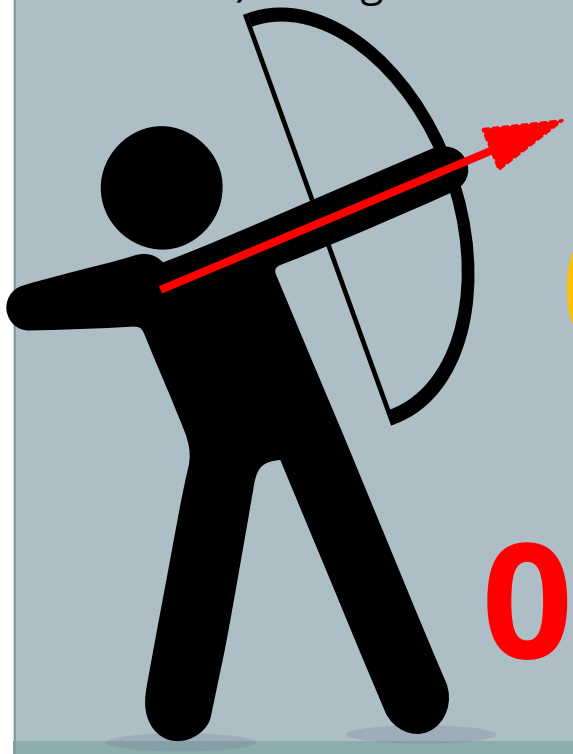
Pre-feasibility Stage entails: -

a) Project Identification and initiation;
b) Collect existing information;
c) Describe requirements for feasibility stage; and
d) Assess the current legal status of water uses
e) Integration into county and utility plans

02

The Feasibility Stage entails: -

a) Address legal requirements of recharge tests;
c) Conduct feasibility study (including recharge tests);
d) Preliminary infrastructure design;
e) Compile detailed implementation plan;
g) Estimate costs; and
h) Identify funding sources



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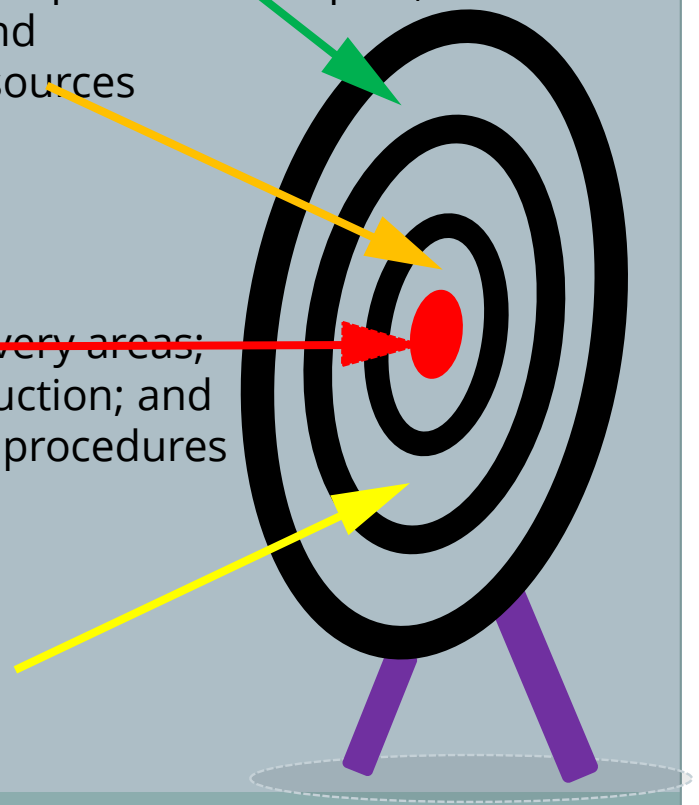
Implementation Stage entails: -

a) Drill and test new injection/abstraction wells;
b) Construct infiltration basins;
c) Set up monitoring systems for recharge and recovery areas;
d) Detailed infrastructure design, tender and construction; and
e) Compile monitoring, operation and maintenance procedures



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Operation and Maintenance Stage entails: -

a) Perform monitoring and reporting;
b) Maintenance and optimization; and
c) Develop final monitoring and reporting system