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## **Organisation**

Cap-Net UNDP Federal Institute for Geosciences and Natural Resources (BGR)

## **Corresponding Author**

Dr. Mirghani, Muna

## **Corresponding Author Contact**

[munamirghani@yahoo.de](mailto:munamirghani@yahoo.de)

## **Summary**

The Nile region relies heavily on its groundwater, nevertheless, it is often neglected in national water policies. Efforts were made to integrate groundwater as an aspect of IWRM, predominantly through a proposal of relevant capacity building actions. These were categorised into three groups: groundwater governance, operational management, and analytical tools to support operational management, illustrating that the main focus should be devoted to institutional and regulatory frameworks and management instruments.

## **Background**

Drinking water supply in all Nile countries rely on groundwater for more than 65% of the total consumption. Not well recognised in national water policies, groundwater has proved being the major resource in development plans of water supply, irrigation as well as industrial sectors. Some large agricultural investments that greatly contribute to the food security and national economy are solely dependant on groundwater use.

Groundwater potential is largely defined by the hosting hydrogeological environment. There are four hydrogeological provinces in the Nile Basin, namely: Precambrian “basement” rocks; volcanic rocks; unconsolidated sediments; and consolidated sedimentary rocks. The geographical distribution of the four hydrogeological environments suggests that thirteen groundwater basins are shared among two to three countries with no corporate management of their resource. While sedimentary basins form the largest hydrogeological province population distribution was exceptionally higher on basement terrain, where the groundwater potentially is lower than sedimentary basins. This has exposed groundwater to pollution risks from human activities on the unprotected basins’ catchment zones.

The safe development of groundwater reserves should consider various scenarios such as variability of natural recharge, transboundary reaches, and legal and institutional mechanism. These scenarios add to the challenges for groundwater management, which involves lack of sufficient knowledge on natural recharge due to key methodological gap, lack of corporate management of transboundary aquifers and poor understanding of local institutional roles, legislation, and water rights.

Countries are at different stages of development in groundwater management, and thus have different type of needs.

Wet countries as Burundi, Rwanda and DRCong where water resources of different forms are still underdeveloped, and ground water use is below 10% of the supply. In such cases, national water sector strategies have not emphasised groundwater equally to green and blue water management. In fact, these countries are still in the stage of formulating its sector strategies.

In countries as Uganda, Ethiopia and Sudan groundwater represents a major source for domestic, industrial as well as irrigation purposes in case of Sudan and to some extent Ethiopia. However, groundwater issues are not addressed properly in Ethiopia and Sudan, while a process of reform is advancing slowly in Uganda.

## **Actions taken**

A study was made to propose a relevant set of capacity building actions in groundwater management issues as an aspect of IWRM for the Nile Region. The activities were supported by the Cap-Net/UNDP programme for capacity building in IWRM and the Federal Institute for Geosciences and Natural Resources (BGR).

The main objective of the project was to analyse the integration of groundwater aspects in national water management in East Africa with a focus on, and recommendations for, possible capacity development actions aiming at strengthening this integration. The survey clearly indicated shortcomings in groundwater data and information leading to:

- Limited knowledge of groundwater potentials in various areas,
- Limited capacity for groundwater development,
- Pollution of groundwater from onsite sanitation,
- Poor catchment protection leading to reduction in yields and pollution of springs and shallow wells.

An important conclusion of the review is concerning the capacity building for IWRM. Overall, the lack of local knowledge to support integration of water resources management has greatly contributed to the slow implementation of the integrated approach. From the survey it is clear that universities and research institutions are not aware of the aspects of IWRM in groundwater management. It can be concluded that decision making level, although aware of IWRM challenges, it is beyond their capacity to implement the required change and need support. It is completely shocking to witness the ignorance of education and research institutions in up-to-date principles of IWRM and its implementation challenges. A major recommendation is to establish or upgrade groundwater-oriented research and education centre for the Nile region.

The study identified constraints and required capacity building actions addressing groundwater management issues under IWRM framework for the Nile region. Various existing and planned country programmes/ projects, which are expected to support sound groundwater resources management are identified for possible cooperation.

Three capacity building approaches are recommended. Recommendations involve individual skills building, improving the organisational capacity as well as engaging with a number of interventions with local capacity building institutions, or directly with communities, local governments and groundwater use sectors.

## Outcomes

Key capacity building actions are recommended and approaches/modalities for implementation are suggested. They are classified under three themes, namely, groundwater governance, operational management, analytical tools to support operational management:

1) Policies, institutional and legal frameworks. Recommended actions to develop an enabling environment for sustainable groundwater management involve:

- Capacity building support is needed in developing appropriate institutional frameworks for groundwater management in view of decentralisation of groundwater development to districts and decentralisation of water resources management to basin boundaries or water management zone.
- Training on policy instruments for integrated groundwater management (use, protection and conservation).
- Applied research on issues of legislative framework for groundwater management with regards to emerging challenges of MDGs, climate change and environment sustainability.

2) Development, Operation and Maintenance. Key recommendations for capacity building action in operational management include, among others:

- Training for managerial and administrative staff in integrated groundwater basin plans to improve and support operational management.
- Capacity building to water authorities, private operators, pump mechanics, and some community members on methodological operation and maintenance of both rural and urban water supply installations.
- Capacity building at both national and local levels to identify and monitor potential threat to groundwater due to poor sanitation and waste discharge. Specifically, capacity for regulation of both point and non point source pollution needs to be built.

3) Resources exploration, Assessment, prediction. Key capacity needs in the region are:

- Training for managerial and administrative staff in integrated groundwater basin plans to improve and support operational management.
- More training of trainers and practitioners is required in areas of groundwater resources assessment emphasising geophysical exploration methods, monitoring network design, data management (data collection from ground or remote-sensed sources, data analysis and interpretation and groundwater data presentation using GIS tools).
- Enter into cooperation agreement for database regular maintenance and update.

Approaches recommended to implement the capacity building actions are three folds. Capacity building actions recommended involve working with institutions (enabling environment) to enhance sustainable water delivery in the groundwater sector (state governments & national governments). A second category of recommended capacity building actions move beyond individual skill building and call attention to improving the organisational capacity. Most responses emphasised more programmatic actions to engage with a number of interventions with local capacity building institutions, or directly with communities, local governments and groundwater use sectors.

## Lessons Learned

It is believed that hydrogeological capability makes groundwater allocation more effective, but the

issues remain to ensure the institutional and regulatory frameworks as well as management instruments for the sustainable management of this precious resource.

Sustainable use of groundwater resources would inevitably require enabling institutions and organisational structure, regulation, information, technology, as well as capable human resources.

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