



ICPAC

2018

Water Sector-wide Assessment Desk Study Report



ICPAC

IGAD-ICPAC

10/3/2018



United Nations
Educational, Scientific and
Cultural Organization



Table of Contents

LIST OF ABBREVIATIONS	III
1 INTRODUCTION	1
1.1 MAJOR OBJECTIVES	1
2 REVIEW OF WATER SECTOR NEEDS	2
2.1 TRAINING AND CAPACITY DEVELOPMENT	3
2.1.1 <i>CHALLENGES IN WATER SECTOR THAT NEED CAPACITY TRAINING AND DEVELOPMENT</i>	4
2.1.2 <i>SECTORAL NEEDS</i>	7
3 RECOMMENDATIONS	9
4 REFERENCE	11



LIST OF ABBREVIATIONS

ACE-WATER-2	African Networks of Centres of Excellence on Water Sciences PHASE II
AUC	African Union Commission
AU-NEPAD	African Union - NEw Partnership for Africa's Development
CAACs	Catchments Area Advisory Committees
CEANWATCE	Central-Eastern Africa Network of WATER Centers of Excellence
CoEs	Centres of Excellence
EU	European Union
GIS	Geographic Information System
HCD	Human Capacity Development
ICPAC	IGAD Climate Prediction and Applications Centre
IGAD	Inter-Governmental Authority on Development
JRC	Joint Research Centre
KEWI	Kenya Water Institute
MWS	Ministry of Water and Sanitation
NIB	National Irrigation Board
NWCPC	National Water Conservation and Pipeline Corporation
NWSS	National Water Services Strategy
SDGs	Sustainable Development Goals
UNESCO	United Nations Educational, Scientific and Cultural Organization
WAB	Water Appeals Board
WaSH	Water, Sanitation, and Hygiene
WRA	Water Resources Authority
WRUAs	Water Resource Users Associations
WSBs	Water Services Boards
WSPs	Water Service Providers
WSRB	Water Services Regulatory Board
WTF	Water Trust Fund

1 INTRODUCTION

This report is a desktop study on Human Capacity Development (HCD) activity carried out by IGAD Climate Prediction and Applications Centre (ICPAC) under Central and East African NEPAD Water Centres of Excellence (CEANWATCE) through the “NEPAD African Network of Centres of Excellence on Water Sciences and Technology (phase II)”. This second phase of NEPAD Centres of Excellence on Water has the aim of supporting the establishment of Human Capacity Development Programme in the Water Sector in Africa through the NEPAD African Network of Centres of Excellence in Water Sciences and Technology (CoE).

Building on the experience and arrangement gained by the CoEs in West and Southern Africa through their established networks, the coordinator of the CEANWATCE network, namely the University of Khartoum is in charge of coordinating the preparation of the Human Capacity Development Programme at national level in the countries of the CEANWATCE members. In each country, the HCD programme will be prepared in close consultation with all key water related stakeholders. The Centre of Excellence will collaborate as much as possible with National IHP Committees, and will be in charge of coordinating the preparation of an HCD Programme in that country.

1.1 MAJOR OBJECTIVES

The project is supporting the implementation of the African Water Ministers’ Declaration urging the AUC and NEPAD Water Centres of Excellence to develop a “Human Capacity Development Programme for junior professional and technician level capacity challenges in the water sector” at national level in the CoE countries. Under the UNESCO’s agreement with EU/JRC, UNESCO will implement part of the activities through implementation partnership agreements with the NEPAD CoE. In particular, the work concerning the establishment and implementation of the HCD Programme at national level in all the NEPAD CoE countries.

After preparing and adopting the HCD Framework for junior professionals (young graduates, post graduates, professionals entering into the sector) and technicians, each country will implement their own HCD framework. The activity will consist of: dissemination of the framework to stakeholders, donors and training institutions and Gov’t Institutions at national

level; designing new courses addressing junior professional and technician level capacity for top 3 priorities established in the strategy; implement the courses for junior professionals and technicians; personnel and students' regional exchanges improving regional networking and collaboration.

2 REVIEW OF WATER SECTOR NEEDS

In 1963 when Kenya attained independence, the per capita water availability was 2,399 m³/year. This meant there was almost 2.4 million liters of water available for every Kenyan per year. In 2010, the available water per person was 650,000 m³/year. Four years later in 2014, the available water had shrunk to 461,000 m³ per person. It is estimated that in 2025, our population will strain water sources so much that only 235,000 m³ of freshwater per person will be available as a result of population growth (Marshall, 2011). The United Nations classifies Kenya as a water-scarce country on the basis of having one of the lowest natural water replenishment rates. This observed changes in water availability can be attributed to climate variability, catchment degradation, and population pressure. With this observations there is need to review the existing capacity and needs under the water sector and develop an improved curriculum that can be used to train the technical and professional staff. The HCD should also involve areas water supply improvement and sustainability. Below is a list of institutions that fall under the sector, we will select some of them to be involved in the stakeholders meeting to develop the HCD framework;

- Ministry of Water and Sanitation (MWS) · Development of legislation, policy formulation, sector coordination and guidance, and monitoring and evaluation.
- Water Resources Authority (WRA) - Planning, protection and conservation of water resources; Planning, allocation, apportionment, assessment and monitoring of water resources; Issuance of water permits; Water rights and enforcement of permit conditions; Regulation of conservation and abstraction structures; Catchment and water quality management; Regulation and control of water use; Coordination of the IWRM Plan;
- Catchments Area Advisory Committees (CAACs) - Advising WRMA on water resources issues at catchment level.
- Water Resource Users Associations (WRUAs) - Involvement in decision making process to identify and register water user; Collaboration in water allocation and catchments

management; Assisting in water monitoring and information gathering; Conflict resolution and co-operative management of water resources.

- Water Services Regulatory Board (WSRB) - Regulation and monitoring of Water Services Boards; Issuance of licenses to Water Services Boards; Setting standards for provision of water services; Developing guidelines for water tariffs.
- Water Services Boards (WSBs) - Responsible for efficient and economical provision of water services; Developing water facilities; Applying regulations on water services and tariffs; Procuring and leasing water and sewerage facilities; Contracting Water Service Providers (WSPs).
- Water Service Providers (WSPs) - Provision of water and sewerage services.
- Water Trust Fund (WTF) - Financing provision of water and sanitation to disadvantaged groups.
- The Water Appeals Board (WAB) - Arbitration of water related disputes and conflicts.
- National Water Conservation and Pipeline Corporation (NWCPC) - Construction of dams and drilling of boreholes
- Kenya Water Institute (KEWI) - Training and Research in Water sector for sustainable development.
- National Irrigation Board (NIB) - Development of Irrigation Infrastructure.
- National Water Harvesting and Storage Authority (NWHSA)

2.1 TRAINING AND CAPACITY DEVELOPMENT

Capacity development is a holistic process operating at three levels, which may be interlinked in specific measures; institutional development, organizational development and human resources development. Within this process, people, organizations and societies mobilize their capacities to shape their own sustainable development (Crocker et al., 2016).

Many failures in water resources management are the result of lack of trained staff and weak institutions. For example, capacity-building has been identified as the missing link in African development. Many national and local institutions, responsible for water management and water delivery do not work efficiently or effectively. Contributing factors include: inappropriate

policies for water management and unclear definition of the mandates of the institutions, lack of resources (inadequate funding and human resources), working in an environment that is not conducive for institutions and inhibits job, inadequate education and training facilities and lack of participation and commitment from communities and customers (Hamdy et al., 1998)

The inadequacy of water services as well as the intensifying competition for clean water has inspired a remarkable consensus among developing countries and external support agencies (ESAs) on the need for integrated planning and management of the resource and its use. Capacity building in particular is now widely regarded as a key element in ensuring sustainable water sector development (Hartvelt, 1996).

2.1.1 CHALLENGES IN WATER SECTOR THAT NEED CAPACITY TRAINING AND DEVELOPMENT

Among the key challenges facing the water sector that need human training and capacity development include:

1. Irregular and Infrequent Human Capacity Development and Training

Training and capacity building are long established critical components of global water, sanitation, and hygiene (WaSH) policies, strategies, and programs. Expanding capacity building support for WaSH in developing countries like Kenya, is one of the targets of the Sustainable Development Goals (SDGs). There are many training evaluation methods and tools available. However, training evaluations in WaSH have been infrequent, have often not utilized these methods and tools, and have lacked rigor (GIZ, 2013).

There is a substantive human resources capacity gap in WaSH, which will only widen with population growth and heightened service quality benchmarks and coverage targets introduced with the SDGs. In response, the need for training in WaSH will also increase. The few published training evaluations in WaSH tend to lack rigor, and do not draw on the extensive evidence that exists outside of WaSH.

2. Climate Variability

Rainfall patterns in Kenya are extremely variable not only spatially and temporally, but also in rainfall intensities. This makes the natural flow of water in the watercourses highly variable in

space and in time. Major recent floods (3 year recurrence) which effected Kenya occurred in 1997-8 (El Nino) and 2003. Major drought periods have been recorded every 7-10 years with the severest occurring in 1981-1985 and 1998-2000. The high variability of rainfall patterns affects the annual safe yields that may be extracted and could only be overcome by optimizing, providing and managing of water storage facilities. However, the previous actors in the water sector (GoK and Development Partners) did not give adequate priority to water storage mainly due to the high investment costs. (Lessons Learned Support to the Kenyan Water Sector Report, 2010)

3. Catchment Degradation

Catchment degradation is causing increased runoff, flash flooding, reduced infiltration, erosion and siltation and this is undermining the limited sustainable water resources base in the country. The main causes of catchment degradation are poor farming methods, population pressure (forest excision for resettlement) and deforestation (for agricultural land and fuel wood). For example, the sediment yields for the Ewaso N'giro and Tana Rivers have increased 15 times the level of 1970 (The National Water Resources Management Strategy, 2008). Catchment degradation will invariably affect surface water availability as rivers and reservoirs will dry up.

4. Inadequate Hydrological Network Stations

The hydrometric network and data recording and reporting system for monitoring and assessing the river flows has deteriorated and can no longer support adequate assessment of the water resources base of the country. The number of river gauging stations in Kenya has shrunk from over 900 in the early 70s to less than 100 currently operational (The National Water Resources Management Strategy, 2008). Also the monitoring of groundwater resources and The National Water Resources Management Strategy – (NWRMS)

Water resources quality has not been given the attention it deserves. The data gaps in the present assessments need to be addressed.

5. Trans-boundary Conflict

Kenya's neighbours share over half of water resources emanating from within Kenya, mostly surface water. Through the Lake Victoria Basin, Kenya provides about 45% of surface water inflows to Lake Victoria, and hence to the upper River Nile. This inter-dependence between

Kenya, its immediate neighbours, and downstream and upstream Nile countries has considerable implications in the management of the country's major water resources. Different counties in Kenya have conflicts on limited resources and water being major. The severe repercussions have been meted mainly on Kenyan pastoralist hence losing their daily livelihoods.

6. *Flooding*

Kenya has been in recent years hit hard by flooding menace at major catchment areas (riverine flooding). The major floods experienced usually occur in two major rivers, Nzoia and Tana. The aftermath is that many have been rendered homeless, properties destroyed and even to the extremes, has led to death of people in the neighborhood. Major structural damages or failures along the rivers and dams have also contributed to flooding with the latest recorded being the Patel Dam tragedy in Solai, Nakuru County where at least 38 people were killed. Much of these can be connected to inadequate HCD in the water sector to carry out safety inspection as well as developing flood protection mechanism and early warning systems.

7. *Limited natural endowment of water*

Kenya is classified as a chronically water scarce country in absolute and relative terms. The natural endowment of renewable fresh water is about 650 m³/year. Not all of the country's water resources can be exploited. The accessible component is known as the safe yield. The surface water safe yield is estimated to be about 7.4 billion m³/year, while estimated groundwater safe yield is estimated at about 1 billion m³/year. At present, the country withdraws less than the safe yield. In 1992, the National Water Development Master Plan study estimated the level of withdrawal for surface water as 1.1 billion m³/year whereas groundwater abstraction was estimated at 180 million m³/year (Kenya National Development Report, 2006; The National Water Resources Management Strategy, 2008).

In Kenya, some of the topical subjects offered in hydrology by training and research institutions (KEWI and UoN) include;

1. Kenya Water Institute
 - Integrated Water Resource Management
 - Hydrogeology
 - Remote Sensing and GIS

- Water Quality Management
 - Water and Waste Water Laboratory Technology
 - Water Resource Technology and Management
2. University of Nairobi's Department of Meteorology-Hydrometeorology Sector
- Applied Hydrology
 - River Hydraulics
 - Hydrological Modelling and Forecasting (with tools such as GFFS and SWAT)
 - Environmental Impact Assessment in Hydrology
 - Surface Water Hydrology

The people who work in this sector require the knowledge and skills necessary to carry out their roles. But capacity development is also important for building the organizations and the institutional framework that define the scope for activities in the sector. Establishing a well-functioning water management is not only a technical and an economic challenge, but also a political challenge. In many countries, strengthening the capacity of the legal and institutional systems is absolutely essential to ensure the sustainable management of water resources and provide the population with reliable drinking water and sanitation services.

2.1.2 SECTORAL NEEDS

Water-related challenges in Kenya are not limited to water supply and sanitation services. Kenya is classified among the most water scarce countries in the world. Water shortages are experienced by users across the country Kenya is plagued with chronic cycles of flooding and drought that are increasing in frequency and severity, in part exacerbated by climate change, and coupled with population growth, significant upland watershed destruction, and non-equitable distributed of water resources. Other challenges facing the water sector in Kenya; an extremely limited annual renewable fresh water resource per capita., rapidly growing demand for water for multi-sectoral uses, on the one hand, and diminution of natural storage capacity and lack of development of artificial storage capacity to meet demand and to buffer against shocks. Sharing of over half of rivers, lakes and aquifers with neighboring countries, that complicates management of these water resources with implications for regional security and development.

Several reforms have been implemented within the water sector in Kenya. However, water services studies done within the sector reveal that, the management of water resources and water supply has continued to be a major problem. Water reforms have not been sufficiently implemented as expected since most of the expected outcomes of the water sector have not been attained. The reform process albeit on a positive direction, faces challenges in funding, bureaucracy and too many institutions which do not work harmoniously towards the success of the reforms. The institutions which are mandated to carry out the reforms are faced with corruption and do not work as a team.

A study conducted by the Ministry of Water and Irrigation on the National Water Services Strategy (NWSS) between 2005 and 2007 revealed that the institutional framework to adequately carry out the water sector reforms was not properly functional. In addition, the study found out that inadequate strategies were lacking and funds to expand water to all underserved areas in the republic were insufficient and misappropriated. According to the study, there lacked a proper national monitoring and evaluations procedures on water services and that well documented investment programs in the water sector to carry out water reforms effectively were inadequate. Moreover, the sector lacks the resources and capacities required to adequately carry out water sector reforms. Besides, key International organizations like the World Bank and scholars alike argue that countries with effective and efficient institutions to manage their water supplies have fewer water woes.

Gender and water resource management has been one of the unanswered questions in most of the Kenyan societies, as most of these societies are patriarchal. The available legal and institutional frameworks have not been efficient in addressing the issue of gender and gender mainstreaming in the management of water resources (Hamdy, 2004).

2.1.2.1 Major highlights of the topical needs [cross-cutting issues]

- Water safety planning which include effective tools for forecasting and construction of strong structures to minimize flooding.
- Involvement of gender in management of water resources and mapping vulnerabilities in water and sanitation sector.

- Monitoring, evaluation and resource mobilization for programs on sustainable health and sanitation at both local and national level.
- Improvement of Health and Sanitation programs (sustainable water and wash programs) in schools and communities to avert the spread of water and sanitation diseases.
- Fast and effective response to disaster (risk reduction) related to water and interventions to improve water supply, sanitation and hygiene.
- Conducting Integrated water resource management programs to technicians and trainees so as to improve the management of water sector at various levels.^[MB1]

3 RECOMMENDATIONS

Since capacity development is neither an output nor a project, but a continuous process. There is need to continuously train experts, technical staffs and other stakeholders in the water sector so that the sectorial needs are frequently and regularly discussed to avert the challenges emanating from the sector.

WaSH technicians need to have a good understanding on the social, cultural, financial and institutional issues ^[MB2]at the local level. The technicians also ensure that the service users are aware of their rights and responsibilities, such as how users may influence decision makers, and ensure the service providers are accountable to their customers. Some of the areas of training for WaSH technicians include water and sustainable development, environmental health hazards, personal hygiene, water and public health, community engagements among others.

The challenge to the management of Kenya's water resources must therefore offset negative impacts from climatic variability, ensure fair utilization of trans-boundary waters and reverse the growing degradation of water resources thereby achieving a water secure Kenya. This has become a daunting challenge that has not been adequately addressed during the last three decades. There have been inadequate investments in hydraulic and storage structures for flood control, energy generation, irrigation development, urban, industrial, rural and livestock water supply. There has also been extensive degradation of water resources due to weak catchment management, pollution control and water allocation mechanisms. These resources must be jointly managed within agreed frameworks to ensure equity and to avoid conflict.

For improved water source and sanitation to be realized, the following specific strategies are recommended:

- ❖ Capacity building of professional and technical staff in water sector at regional, national and local levels;
- ❖ Raising the standards of the country's overall water resource management, storage and harvesting capability;
- ❖ Rehabilitating the hydro-meteorological data gathering network;
- ❖ Constructing multipurpose dams (e.g. on Nzoia and Nyando rivers); and
- ❖ Constructing water and sanitation facilities to support a growing urban and industrial population.

4 REFERENCE

- Atef Hamdy , Mahmoud Abu-Zeid & C. Lacirignola (1998) Institutional Capacity Building for Water Sector Development, *Water International*, 23:3, 126-133, DOI: 10.1080/02508069808686758.
- Crocker, J., Shields, K. F., Venkataramanan, V., Saywell, D., & Bartram, J. (2016). Building capacity for water, sanitation, and hygiene programming: Training evaluation theory applied to CLTS management training in Kenya. *Social Science & Medicine*, 166, 66-76.
- Frank Hartvelt (1996) Capacity Building Programme for Sustainable Water Sector Development, *International Journal of Water Resources Development*, 12:4, 407-412, DOI: 10.1080/07900629650015
- German Water Partnership Report (2013); German Water Partnership e.V. Reinhardtstraße 32 10117 Berlin. Pp 1& 2
- Hamdy, A., Quagliariello, R., & Trisorio-Liuzzi, G. (2004). Mainstreaming gender in integrated water resource management: major issues and challenges. INGEDI project (pp 33-40). Montpellier: CIHEAM.
- J. Notley, C. Gathuthi, J. Murage, B. Junker, & C. Katee: Lessons Learned Support to the Kenyan Water Sector Report, 2010. pp 45-48
- Kenya National Development Report: A case study prepared by 2nd UN World Water Development Report 'Water: A shared responsibility' (2006). pp 71
- Marshall (2011): The Water Crisis in Kenya: Causes, Effects and Solutions: *Global Majority E-Journal*, Vol. 2, No. 1 (June 2011), pp. 31-45
- Ministry of Water and Irrigation (2009): Kenya Water Sector Strategic Plan (KWSSP) Report. pp 16-23
- The National Water Resources Management Strategy (NWRMS). (2008). [online] Nairobi: Government of Kenya. Available at: <https://www.waterfund.go.ke/watersource/Downloads/006.%20Water%20Resources%20Management%20Strategy.pdf> [Accessed 26 Sep. 2018].

