

**Nile Basin Initiative
Nile Trans boundary Environmental Action Project**

**REGIONAL SUMMARY OF
KEY MESSAGES**

**FROM THE NATIONAL
REPORTS ON
INSTITUTIONAL AND
TECHNICAL CAPACITIES
FOR WATER QUALITY
MONITORING**

NILE BASIN INITIATIVE

Initiative du Bassin du Nil

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Highlights of National Water Quality Training Modules & Quality Assurance Reports

1. Introduction

In this study, the capacities of institutions to offer training on water quality training in the countries of the Nile Basin were reviewed with a view to developing appropriate country training modules and quality assurance programs for laboratories involved in water analysis in each country. The report looks into the sources of water pollution and suggests water quality parameters of national and trans-boundary concern.

2. Institutional Capacities for Water Quality Training

The institutions involved with water quality issues such as monitoring and training in the NBI countries are mostly universities and government ministries and departments. In some few cases the private sector is also active in water analysis and related training.

In Rwanda, which is a very interesting case, the main actors in water quality training are the Ministry of Health, national University of Rwanda, Rwanda Bureau of Standards and Kigali Health Institute. Each of these institutions is equipped with a laboratory for water testing and training. The performance of these labs is fair and manpower is qualified and trained by the laboratories.

Egypt has in place a vast number of water quality monitoring networks nation-wide within which training is provided. The main network is the Ministry of Water Resources & Irrigation with a total number of 232 sampling sites. Water testing is carried out by the Central Laboratory of the Ministry of Water Resources & Irrigation. Other important water testing institutions are the Central Laboratories of The Environmental Health of the Ministry of Health & Population and their provincial 118 branches which are responsible for testing of drinking water with respect to bacterial contamination. There is also the Egyptian Environmental Affairs Agency (EEAA). This network monitors on quarterly basis the quality of the Nile water by sampling and testing from 69 locations nearby most industrial pollution sources on the Nile. There are many other agencies in the public and private sector conducting similar activities.

In Ethiopia, the training institutions have modules that are partly relevant to the objectives of the training objectives of the Nile water quality monitoring initiative and are potential candidates for offering higher level training in water training monitoring design and supervision. The University of Addis Ababa is a key institution in water quality training. Water Technology Institute under Arbaminch University was established in 1987 for the purpose of delivering training at degree, diploma and certificate levels in hydraulic, irrigation and sanitary (environmental) engineering. Ever since, the institute has produced hundreds of graduates and undergraduates in degree, diploma and certificate levels in these subject area. In addition, the institute has been offering tailor-made training in water quality analysis, water training and water works operator training, irrigation management, etc to trainees upon the demands of the regions and NGOs operating in various localities in Ethiopia. There is also the water quality laboratory under the department of water and environmental engineering. The laboratory has a

reasonably complete list of equipments and capabilities for the analysis of physical, chemical and bacteriological parameters. The department of applied science in Arbaminch University has a chemistry laboratory with a list of useful advanced instruments such as the atomic absorption spectrometers and chromatography. Many of these instruments are already in operation and are being used by the department of water and environmental engineering for training and research.. In addition to these institutions there are still many other regional training sites with relatively adequate laboratories for training. Environmental Protection Authority, Ethiopian Nutrition & Health Research Institute Addis Ababa Water & Sewerage Authority, Ethiopian Geological Survey and Ethiopian Agricultural Research Organization are key actors in the area of water quality training.

In the Democratic Republic of Congo water quality training is very much part of training modules in biological and environmental studies at the universities. University of Kinshasa offers environmental training at its department of biology and environment ranging from diplomas to masters. University of Kisangani offers specializations in biological sciences at its department of biology, University of Lumubashi and University of Cardinal Malule of specializations in environment-related sciences. The laboratories attached to these establishments are operational though they suffer from lack of equipment and resources for the procurement of reagents. The existing staff for water quality training is well trained but they are few in number. In fact the number of experts in water quality training has hardly more than a dozen of qualified personnel in the field of water quality training at the higher education institutions. Likewise, Burundi shares largely the same weaknesses and insufficiencies in water quality training issues

In Uganda water quality testing capacity exists in government institutions and private sector laboratories. The Public Health Department of the Ministry of Health has surveillance programs for drinking water quality in a number of towns. There are also undocumented monitoring programs under the private sector, local government and NGOs.

Kenya has over 100 institutions that specialize in water and sanitation issues. All water and sanitation training matters are required to be approved by the ministry of water, environment and education. Bsc, Msc and PhD trainings are carried out in public universities; Nairobi University, Moi University, Kenyatta University, Jomo Kenyatta university of Agriculture & technology Maseno University, etc. Certificates and diplomas are given by universities and national poly-techniques.

Some of the training institutions have the capacity to carry out the water quality testing and analysis and they also have the modern technologies and computer facilities to carry out the data analysis and interpretation. The Ministry of Water has well-equipped laboratories for water tests, though most of them are outdated. The laboratories at the various branches of the ministry lack modern facilities and have insufficient technical staff to carry out water quality tests and analysis.

Tanzania is also active in water quality training. The trainings that cover essentially cover sampling analysis, monitoring and modeling are taught at the following institutions:

- Rwegarulia Water resources Institute (RWRI)
- University of dare s Salaam
- University College of Lands & Agricultural Studies
- Sokoine University of Agriculture
- Medical and pharmacy institutions
- Dar es salaam Institute of technology

The academic level to be attained distinguishes the level and nature of training in these institutions. Whilst specialized training for prospective WQ laboratory technicians is offered at RWRI, the training at the graduate and post-graduate levels is broad in which the courses touching aspects of water quality from part of the overall degree programs.

3. Water Quality Training Modules

Training modules exist in all the countries of the Nile Basin but they need strengthening and support. What the reports reveal is that the countries of the Nile Basin present similar weaknesses and gaps in water quality training. In Ethiopia, there are a number of water quality trainings at different levels. These trainings cover post-graduate level and field personnel in water quality monitoring and laboratory assistants. For instance, the University of Addis Ababa offers two post-graduate training programs at the faculty of science and faculty of engineering. These institutions have modules that are partly relevant to the objectives of the training objectives of the Nile Water Quality Monitoring initiative and are potential candidates for offering higher level training in water training monitoring design and supervision. The Water Technology Institute under Arbaminch University was established in 1987 for the purpose of delivering training at degree, diploma and certificate level in hydraulic, irrigation and sanitary (environmental) engineering. Ever since, the institute has produced hundreds of graduates and undergraduates in degree, diploma and certificate levels in these subject area. In addition, the institute has been offering tailor-made training in water quality analysis, water training and water works operator training, irrigation management, etc to trainees upon the demands of the regions and NGOs operating in various localities in Ethiopia.

In Rwanda there is no laboratory set aside specifically for the provision of training in water analysis. Individual laboratories train their own manpower to the extent that some of them have become specialists in physical and chemical analysis. They are capable of performing basic or elementary, advanced chemical, microbiological and bacteriological analysis of water.

In the Democratic Republic of Congo water quality training is very much part of training modules in biological and environmental studies at the universities. University of Kinshasa offers environmental training at it department of biology and environment ranging from diplomas to masters. University of Kisangani offers specializations in biological sciences at its department of biology, University of Lumubashi and University of Cardinal Malule of specializations in environment-related sciences. The subject areas covered by this course include general and applied microbiology, environmental micro biology, hydrology and natural resources management, hydrology and hydrochemistry, soil and water chemistry and ground water hydrology. The laboratories attached to these

establishments are operational, though they suffer from lack of equipment and resources for the procurement of reagent.

The key areas of training/ Training Modules to be adopted in the NB should include the following:

- Water treatment
- Analysis of raw water
- Microbiological analysis of raw and treated water
- Biological water quality monitoring
- Sampling techniques
- Data management
- Basic hydrology
- Basic knowledge on Wetlands and biodiversity
- Laboratory management
- Water Quality Assurance

4. Technical Capacities For Water Quality

The exiting capacities in water quality training in the countries of the Nile Basin vary from one country to another. Most of the capacities for water quality training in the individual countries exist at the lead national universities and institutes. However, the overall status of WQ capacities is weak because all the countries of the Nile Basin suffer from understaffing and lack of resources to modernize their laboratories. Uganda and Egypt have good technical capacities. Some of the capacities that exist in Uganda can be summarized below:

Government:

- Water Quality & Pollution Control laboratory-Entebbe
- Rural Water & Sanitation Laboratory –Mbale
- South Western Towns laboratory – Kabale
- Government Analytical Laboratories, Kampala – Wandegaya
- Uganda National Bureau of Standards Laboratory Kampala, Nakawa
- National Water & Sewerage Corporation – Central Laboratory, Kampala – Bugolgobi
- Makerere University, Kampala – Departmental Laboratories
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Private labs:

- Chemiplar Laboratory
- Century Bottling Company Limited
- Kasese Cobalt Co. ltd

The existing staff for water quality training in the DRC is well trained but they are few in number. In fact the number of experts in water quality training has hardly more than a dozen of qualified personnel in the field of water quality training at the higher education institutions. In the rest of the countries, the institutions that are responsible for water

quality management are also the ones that provide the technical capacities for water quality training. The overall assessment of the existing technical capacities, ie ; labs and staff reveals weaknesses that need to be addressed immediately.

5. Water Quality Assurance

Water quality assurance program does not exist in most of the NBI countries due to the problems outlined in the other water quality issues. So if we have serious gaps in water quality monitoring this will automatically have an impact on water quality.

6. Recommendations

- At least 2 local experts in biological and bacteriological water analysis should be identified to lead training for water quality assurance
- Short courses in water quality management to be initiated
- Modernization of existing labs and building new ones is needed
- Community training and awareness on water quality issues required
- Courses at institutions of higher education should be designed in a way to encourage working persons to take them piecemeal
- The need for water quality assurance programs in the NBI countries is timely
- Establish standards for WQ analysis
- Training in identified water quality management areas to be undertaken within the basin using the resources in the basin
- Training on water quality management in the NB to be coordinated

ANNEX1: INSTITUTIONAL AND TECHNICAL CAPACITIES MATRIX

ANNEX2: TRAINING MODULES MATRIX