NILE TRANSBOUNDARY ENVIRONMENTAL ACTION PROJECT

REGIONAL WATER QUALITY WORKING GROUP

PROCEEDINGS OF THE 3RD WORKSHOP, 17-19TH NOVEMBER, 2005, HELD AT THE WINDSOR LAKE VICTORIA HOTEL, ENTEBBE, UGANDA.

Prepared by Mr. John M. Omwenga,

Water Quality Lead Specialist

PMU, Khartoum, Sudan,

November, 2005

NILE BASIN INITIATIVE

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CHAPTER ONE: Official Opening Session

1.1 Welcome Remarks by Ms Apophia Atukunda National Project Coordinator,

Ms Apophia Atukunda

In her Opening Remarks, Ms. Atukunda, expressed her immense gratitude to the participants for coming, despite some fears about riots and unrest in Kampala which had made some participants cancel their participation. She thanked her planning tem consisting of the WQWG members and staff of the Ministry of Water Resources. She also thanked the Nile- Sec for offering the necessary support. She also thanked the Guest of Honour, Hon. Maria Mutagamba, and Minister of State for Water, for coming to open the Workshop. She also thanked the PSC member, Dr. Aryamanya Mugisha- Henry, for agreeing to chair the Opening Session.

1.2 Opening Remarks by Mr. John Omwenga, Water Quality Lead Specialist

Our Guest of Honour,

Your Excellency, Hon. Maria Mutagamba, Minister of State for Water,

The Executive Director of the NBI, Mr. Patrick Kahangire,

The Executive Director of NEMA, Dr. Aryamanya Mugisha-Henry,

The Commissioner for Water, Nsubuga Nsefuma,

Distinguished invited Guests, Ladies and Gentlemen:

Greetings from PMU/Welcome

On behalf of the NTEAP, and on my own behalf, I wish to thank you all for coming to this beautiful city of Entebbe, to attend our third and most important Regional Workshop. May I take this opportunity to welcome you to the Workshop and to wish you a very comfortable stay for the next few days.

This is another historic occasion for all of us, to be here as water resources management experts from the Nile riparian countries, to meet

and share experiences on water quality management issues. We are meeting here under the auspices of the Nile Basin Initiative, whose shared vision is indeed fitting and appropriate to this occasion. Water is a catalyst for cooperation. Cooperation on water should be seen as a long term investment, requiring realistic objectives, and phased implementation of projects and programs. The key factors for success include a shared vision, political commitment and broad based partnerships, all of which are ingrained in the Nile Basin Initiative.

1,2nd Workshops/focus/Ministers

As you are aware, this is the 3rd NTEAP RWQWG workshop. Our first Workshop was held last December in the Nile water Sector, Naser City, Cairo, Egypt. The 2nd in Bujumbura, Burundi. The focus of the first workshop was the official inauguration of this Regional Water Quality, Working Group which also initiated trans boundary networking between all of us. The second workshop discussed the Water Quality Monitoring Baseline reports. We have been honoured in both our previous Workshops to have the Ministers for Water and Environment officiating in these functions.

Distinguished Guests, Ladies and Gentlemen:

Why Entebbe?/NBI Sec/CBSI/SVP coordination/Policy of NTEAP

Some of you may have been surmising why Entebbe, was selected to host this Workshop. The reason is simple. Entebbe is one of the cities within the Nile basin and is home to the NBI. All cities are eligible to host future Workshops. It is also the policy of NTEAP to spread out Regional Workshops and events across all the cities of the Nile Basin. It houses, the Nile-Sec, CBSI and SVP coordination.

Thanks for coming/Minister, Partners,ED, PSC,TAC and all.

We are gathered here today, courtesy of the generous hospitality of the Government of Uganda, and in particular the Ministry of Water, Land

and Environment. My sincere thanks and gratitude go to our Guest of Honour, the Honourable Minister Her Excellency Maria Mutagamba. I wish to thank her for finding time from her busy schedule to come and officiate at this function. On the same vein, I wish to thank Mr. P. Kahangire, ED NBI, the E/Director NEMA, who is NTEAP, PSC member, and Mr. Nsubuga Senfuma, for coming. May I also take this opportunity to thank all the other invited guests from Uganda.

I further wish to take this opportunity to thank our development partners, particularly, WB, UNDP, CIDA and other bilateral partners for being very supportive to NTEAP.

Distinguished Guests, Ladies and Gentlemen,

The main focus of this Workshop is to:

- Review and adopt the agreed on recommendations from both the Cairo and Bujumbura Workshops
- Review and examine the progress that has been made in the implementation of the agreed decisions,
- Examine the progress so far made in the implementation of the WQC activities and their impacts.
- To discuss the Draft Work plan for 2006, with reference to the proposed action plan to 2008, the end of the Project.
- Discuss any other Basin wide water quality management issues, and
- Visit water quality testing and environmental monitoring facilities as well as the source of the Nile at Jinja.

The outputs of this workshop are expected to be :

- Adoption of the both the Cairo & Bujumbura Workshop Decisions,
- Adoption of the Draft WQC Work plan for 2006,
- Recommendations on the way forward in Water Quality and Environmental Management.

Challenges of Trans boundary WQM

We have started on the right path, addressing the trans boundary challenges highlighted in the Trans boundary Environmental Analysis. Our common environmental problems continue to be loss of biodiversity, desertification, flooding, water weeds, declining fisheries, and encroachment on wetlands. Poverty, often made worse by civil strive, continues to afflict many communities while having a significant impact on the environment.

We are far from solving these problems. What is required is to initiate transboundary solutions to transbounday problems and to create and support strong institutions, and encourage partnerships and strong regional networks.

Water resources within the Basin are scarce and are unevenly distributed. Where water is available, it has to be checked for suitability for use, in order to ensure its safety. Our countries acknowledge the importance of water resources management. In this regard also, it should always be remembered that the Nile River is transboundary in nature. As demand for its waters and resultant pollution increases, a basin wide approach for its protection and management is the only viable and sustainable option, if it has to continue flowing as it has done for centuries, servicing and meeting the many basin-wide demands.

Distinguished Guests, Ladies and Gentlemen:

Objectives of NTEAP/capacities/awareness creation and information sharing

One of the objectives of the Water Quality Component is to initiate a basin wide dialogue on water quality management .Your meeting today is a true testimony to this objective. In the next few days, we will be focussing on how best to manage water resources and environmental

challenges that afflict the basin I hope that we will be able to come up with tangible recommendations on the way forward.

Distinguished guests, Ladies and gentlemen:

Thanks and Appreciation

Local organizing Committee

/WQWG/NPC/NBI/Hotel

On behalf of the NTEAP, I wish to take this opportunity to thank you all for your attendance.

THANK YOU ALL.

17/11/2005

John Omwenga

Water Quality Lead Specialist for NTEAP

1.3 Opening Remarks by the Executive Director of the Nile Basin Initiative Secretariat

The Remarks of the Executive Director of the NBI Secretariat, were read on his behalf, by Mr. Tom Wako. In his remarks, the ED welcomed all the Participants to Uganda and wished them a good stay in Entebbe. He told them that their presence together as Working Team from the Nile Basin countries, was testimony that the NBI programs were moving from Planning to implementation. He reiterated the need for riparian ownership and execution of the activites as a strategy for long term sustainability. He called for the creation of strong environmental partnerships, based on the trans boundary needs and problems, as another factor of sustainability.

He reminded the participants that they were their own countries technical ambassadors, and that they should strive to keep the trans boundary spirit burning, by ensuring that they regularly participate in all future regional Workshops.

He also reminded them of the challenges facing the NBI, as that of being visible in all the countries. To this end efforts are being made to establish NBI Focal

offices in all the countries. Another challenge is that of fostering the trust and confidence that already exists between the riparian countries and which took up to thirty years to build. He called upon the participants to enhance environmental solidarity and team spirit among themselves, and to see the NBI as an institution that is there to stay into the future.

He then thanked the development partners for their continuous support, and also all those who are working with the NBI or support the NBI, in one form or another.

In Conclusion, he said that the NBI and cooperation on the Nile is a noble cause, it should live beyond us and we shall be judged by our contribution to this goal and vision, by the future generations. All of us should be mindful of this. He wished all, fruitful discussions and a wonderful stay in Entebbe.

1.4 Speech by Hon. Minister of State for Water, Hon. Maria Mutagamba

The Executive Director, Nile Basin Initiative

The World Bank Representative

The UNDP Representative

The Project Steering Committee member

The Technical Advisory Committee Members
Members of the Regional Water Quality Working Group

Ladies and Gentlemen,

May I take this opportunity, on behalf of Nile Council of Ministers, Nile Basin Initiative and on my own behalf, to extend very warm greetings to all of you and to welcome you all to Uganda on the occasion of the 3rd Regional Water Quality Working Group Workshop. I must begin by expressing my deep gratitude to our development partners and the entire Governments of the Nile Basin Countries, for the firm support extended to the Nile Basin Initiative, which has enabled our region to move from planning to actions on the ground through the various Shared Vision Programs and Subsidiary Action Programs. Nile Transboundary Environment Action Program (NTEAP) is one of the 8 Shared Vision Programs and we as members of the NILECOM are proud that NTEAP was the first program to be launched and the implementation is now ongoing.

As a project, NTEAP is expected to network and create links and partnerships with country level and other regional and environmental and water resources management initiatives. It is my hope that you will be able to identify and establish areas of synergy and collaboration with ongoing activities in the other programs and projects.

There is serious water quality degradation in the region due to increased population growth, poor agricultural practices, industrial growth, and hence the need for the Water Quality Working Group to worker harder for enhanced water resources management. Regional cooperation in the management of the common water resources is essential for reducing conflict, protecting the environment and making the use of resources more efficient, thus creating a basis for investments that will reduce poverty in the long perspective. I am happy that the projects identified are now being implemented for the betterment of our people in the region.

It is my belief that this workshop will help members to share and exchange knowledge and experiences on the management of water resources with the view to establish a common knowledge base between water quality professionals of the Nile basin countries, so that they are all able to offer solutions to the problems affecting the management of Trans boundary water resources.

The development cooperation partners have been on our side since the launch of NBI in 1999. They have demonstrated tremendous goodwill and I must say a new culture of solidarity in the region is emerging on the waterfront. The strategic framework is now translating the goodwill of our partners into concrete and tangible activities.

We salute our development partners who have from the outset remained firmly supportive and committed to NBI and for helping us to maintain the momentum to achieve all that we have up now.

Africa has over fifty river and Lake Basins, most of them without effective inter-governmental agreements for sound management. We now have grounds for hope. The Nile Basin Initiative has taken off and has already produced many tangible and encouraging results. As a priority programme for our region, we shall relentlessly pursue such approaches to translate plans into well-funded development initiatives that result in impact on the ground.

Thank you for choosing Uganda for this workshop, which also hosts the source of the Nile and the Nile Basin Initiative secretariat. I am sure you will enjoy your stay in Uganda. Please take off some time to see the beautiful scenery of this country.

I now take this opportunity to declare the third Regional Water Quality Working Group Workshop open and wish you fruitful deliberations and safe journeys home.

For God and My Country

CHAPTER TWO: Background Presentations

2.1 Overview of the NBI, SVP by Mr. Tom Wako

Nile Basin Initiative

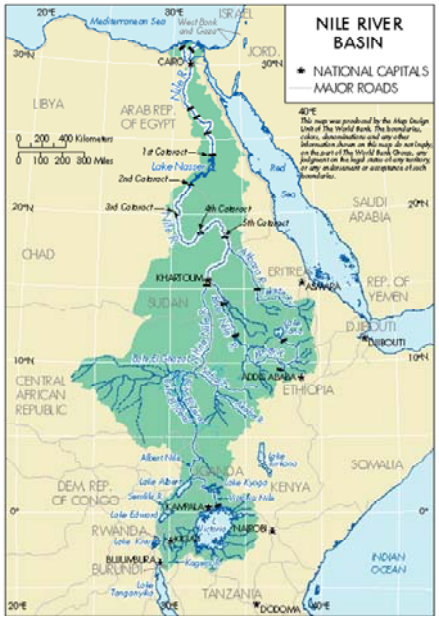
NBI Overview

by

Tom Waako
Program Officer, Nile-SEC

The Nile Basin

- **Burundi**
- **D.R. Congo**
- **Egypt**
- **Eritrea**
- **Ethiopia**
- **Kenya**
- **Rwanda**
- **Sudan**
- **Tanzania**
- **Uganda**



Characteristics

- Population - 300 million
- Poverty
- Rapidly growing Population – stress on land
- Env. Degradation
- Climatic Vulnerability
- Economics integration- nothing flows.

Opportunities

For win-win Cooperative development

(food production, energy, transport, industrial growth, envir. Conservation,…

Evolution of cooperation on the Nile

In Brief:

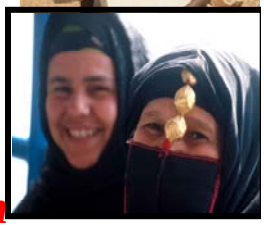
- **Hydro meteorological Surveys Project of the Upper Nile (Equatorial Lakes) Catchments (HYDROMET): 1967-1992**
- **Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile (TECCONILE): 1993-1999**
- **Nile Basin Initiative (NBI): 1999 to date**

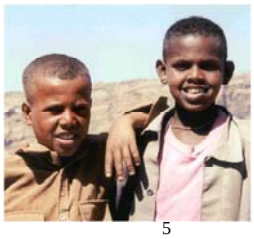
Cooperation on the Nile

- **Following intensive dialogue and consultations, Nile Basin Initiative (NBI) was formally established on February, 1999**
- **Inclusive development arrangements based on a Shared Vision**
- **Development of a shared vision,** important process that facilitates convergence of views towards cooperation
- **Cooperation** unlock dev potential, establishing new environment of development, seeking win-win benefits
- It is a mechanism to begin implementation of the ***"shared vision" through an agreed "Strategic Action Program"***

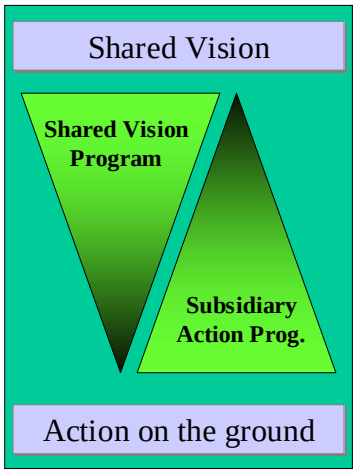
The Shared Vision

"To achieve sustainable socio-economic development through equitable utilization of, and benefit from, the common Nile Basin water resources."





Strategic Action Program for the Nile Basin



Main Tasks

- Create an enabling environment for cooperative investments and action on the ground, within a basin-wide framework.
- Promote Shared Vision through a limited, but effective, set of sub-regional activities and projects.

- NBI Policy Guidelines

NBI Structure

Council of Ministers - Nile-COM

Technical Advisory Committee - Nile-TAC

NBI Secretariat - Nile-SEC

Implementation Arrangement – Decentralized Approach

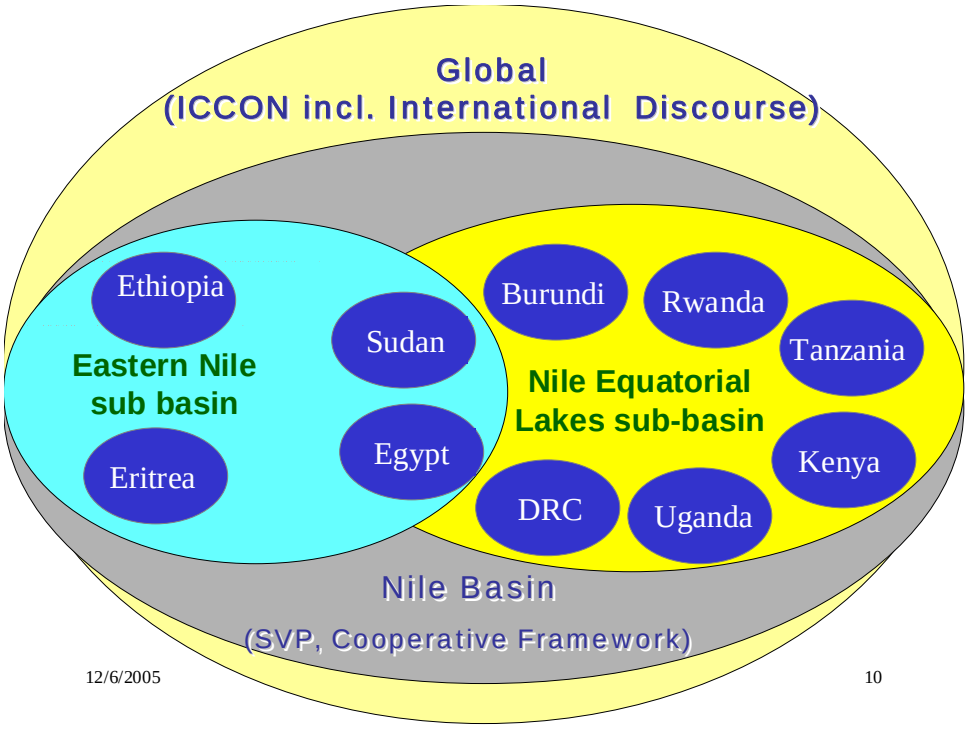
Project Management Units:

Confidence Building	Nile-SEC HQ
Environment	Sudan
Power Trade	Tanzania
Agriculture	Kenya
Water Resources	Ethiopia
Applied Training	Egypt
Benefit Sharing	Uganda/Nile-SEC HQ
SVP Coordination Project	Nile-SEC

Subsidiary Action Programs

Investment projects planned at the lowest appropriate level - within the basin-wide framework

- **Aimed at poverty reduction, economic development & reversal of environmental degradation**
- **Seeking win-win opportunities between riparian countries**



Nile Basin Initiative

The Eastern Nile Subsidiary Action Program

- **Egypt**
- **Ethiopia**
- **Sudan**

The Technical regional Office (ENTRO) Established in

Addis Ababa, Ethiopia, June 2002

IDEN Projects

Integrated Development of Eastern Nile (IDEN) Includes:

1. **Eastern Nile Planning Model**
2. **Baro-Akobo Multi-purpose water resources development**
3. **Flood Preparedness and Early Warning**
4. **Ethiopia –Sudan Transmission Interconnection**
5. **EN Power Trade Investment Program**
6. **Irrigation and Drainage**
7. **Watershed Management.**

Nile Basin Initiative
Nile Equatorial Lakes Region Subsidiary Action Program

Burundi	**Rwanda**
DRC	**Sudan**
Egypt	**Tanzania**
Kenya	**Uganda**

The Coordination Unit NEL-CU established Dec 2001 In Entebbe relocated to Kigali-Rwanda (Jan /04)

12 NELSAP Projects identified for preparation

Environment & Natural Resources Management

- 3 River Basin Management Projects (Mara, Kagera, Sio-Malaba-Malakisi)
- Regional Agriculture project
- Fisheries & Catchment Management Project for Lake Albert and Lake Edward
- Water Hyacinth Abatement in the Kagera River

Hydropower Development & Power Trade in the NEL region (Bur, DRC, Ken, Rwa, Tan, Uga)

- Rusumo Falls HEP (BUR, RWA, TAN)
- Ranking and Feasibility Study of HEPs in NEL-region
- Four Transmission interconnection projects:

  Ken-Uga; DRC-Bur-Rwa; Bur-Rwa; Uga-Rwa

Project Execution

Focuses on ownership:

- **Nile-COM**
  - ***Oversees portfolio & provides overall guidance on policy matters***
- **Nile-TAC**
  - ***Reviews project portfolio and provides technical advice to Nile-COM***
- ***Nile-SEC***
  - **Serves as executing agency with overall responsibility for project delivery on behalf of Nile countries through Nile-COM/Nile-TAC**
  - **Ensure integration, coordination, info-sharing and M&E**

Financing Arrangements: Nile Basin Trust Fund (NBTF)

Nile-COM, March 2001 decided:

- **Request to World Bank to establish Nile Basin Trust Fund (NBTF)**
- **Preferred funding mechanism for SVP**
- **Trust Fund Committee (riparian & donors)**
- **Trust Fund administered by World Bank**
- **Eventual transfer of TF to Nile Basin institution**

Countries' commitments

- **Contribute in kind to the SVP implementation eq to $14million**
- **Continued to finance operating costs of the NBI Secretariat, TAC and COM**
- **Establishment of national NBI Offices**

Issues

1. Not all donors agree to use Trust Fund arrangement;
2. Implementation process is long;
3. Not all priorities of government are included and not all projects get financing;
4. The process and implementation coordination are costly, requiring a lot of funds and high accountability standards;
5. High expectations & therefore hurry for investment oriented projects (*stakeholders tired of meetings and capacity building!*)

Critical Elements and Lessons

- **A Shared Vision**
- **Strong riparian ownership**
- **Effective lead donor/partner**
- **Partnership and commitment of donors/partners (funds, technical and facilitation)**
- **Flexible financing mechanisms**
- **Basin specific priorities based on the situation**
- **Strong advocacy, Stakeholder participation => Build trust**

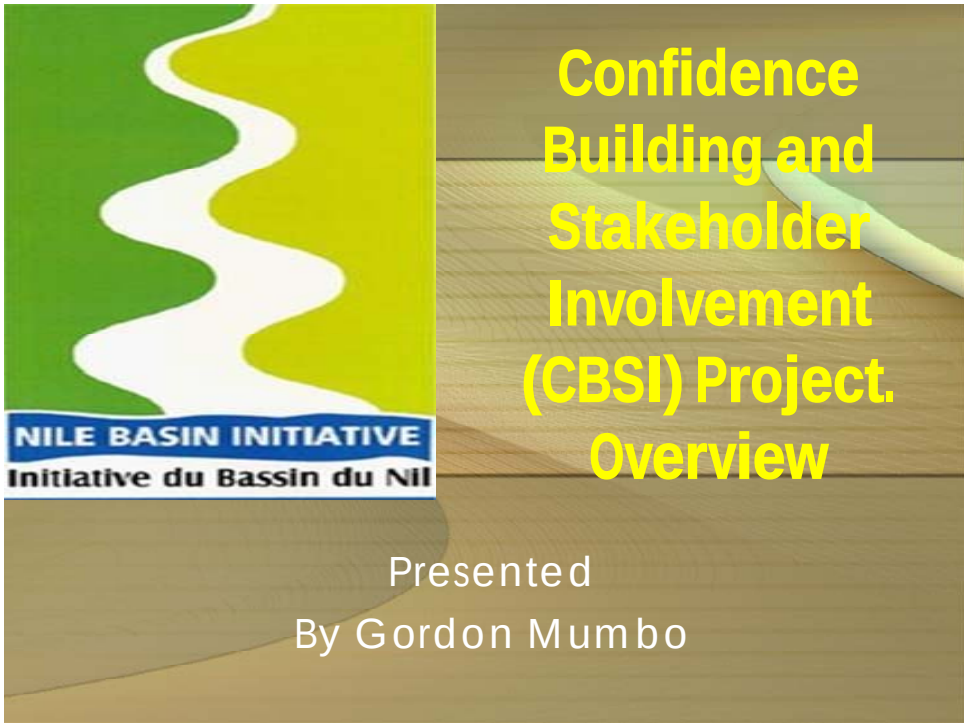
Critical Elements and Lessons (continued)

- **Staying with the process by incremental steps**
- **Optimise benefits, win-win objective/strategy**
- **Multi-track approach to create incentives for the process**
- **Adequate funding and investments for the process (time money, expertise, political, etc.) and coordination**
- **Transparency and accountability**
- **Optimism**

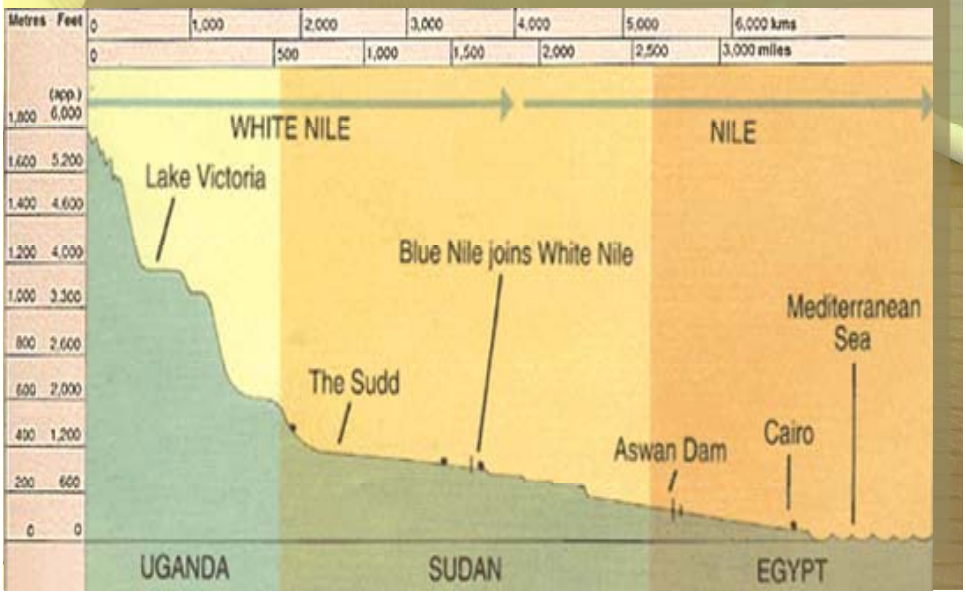
Thank you

www.nilebasin.org

2.2 Overview of the Confidence Building and Stakeholder Involvement (CBSI) Project by Mr. Gordon Mumbo, the Regional Project Manager



Altitudes a long the River Nile

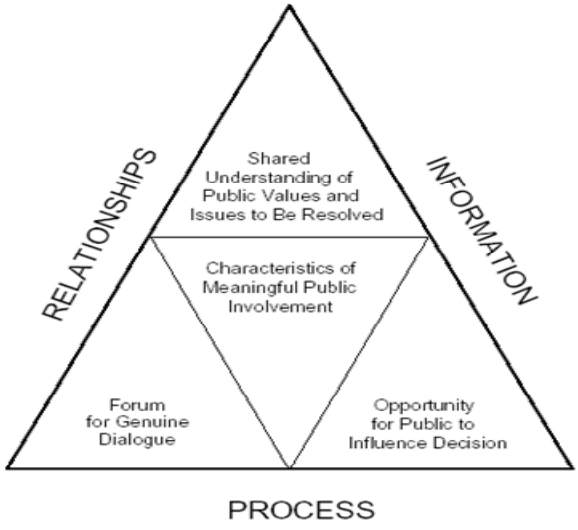


Why CBSI?

Country	Population		Estimated Population in the Basin	
	millions		% of total country	millions
	1998	2030		1998
Burundi	7	12	52	3
DRC	48	114	5	2
Egypt	61	92	95	58
Eritrea	4	7	15	1
Ethiopia	61	114	39	24
Kenya	29	47	40	12
Rwanda	8	15	80	6
Sudan	28	50	85	24
Tanzania	32	56	20	6
Uganda	21	41	100	21
Total	**300**	**548**		**158**

CBSI
Project Objective

•BUILT TRUST
•ENHANCE OWNERSHIP



What are involved

Enchasing Trust and Ownership

INCREASING LEVEL OF STAKEHOLDERS CONFIDENCE

INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
Balanced and objective information - Fact sheets - Web sites	Obtain public feedback on decisions - Public comments - Focus group surveys - Public meetings	Work directly with the public to ensure that issues and concerns are understood - meetings, workshops - Events	Working together as partners in selection of preferred options - Advisory committees - Consensus building - Participatory decision making	Placing final decision making on stakeholder hands at all levels - Delegated decisions

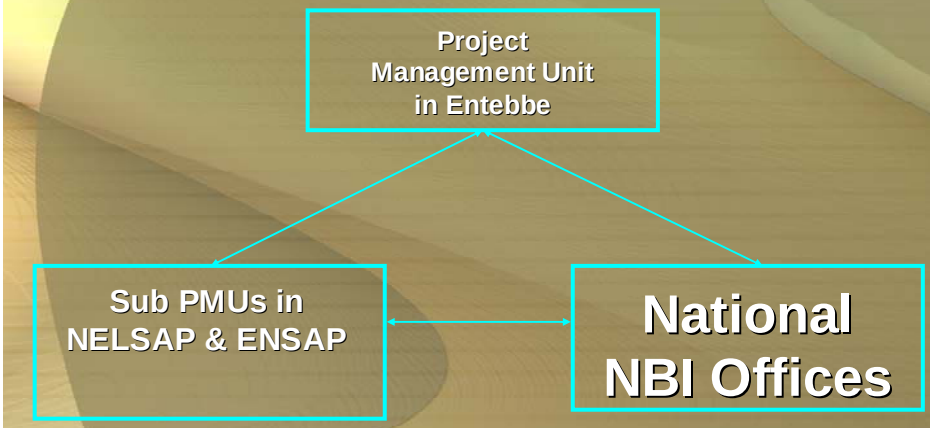
Thrust of CBSI on Riparian States

- Build Trust and Confidence among the countries and establish a presence of citizens who are:
- Capable of self sufficiency in dynamic economies in the region.
- Active participants in the process of governance and utilization of the resources of the Nile.
- Able to effectively communicate and interact with one another in all aspects of development. (all groups women)
- Knowledgeable and focused in the future of the Nile River as a shared resource.
- Able to sit together and put in place legal and administrative provisions and institutions to facilitate the sharing of the resources of the Nile.

Guiding Principles in CBSI Implementation

- **Approach**
  - **Multi-sectoral / Multi-disciplinary**
  - **Multi-national**
  - **Multi-institutional**
- **Investment plans and regulatory framework harmonization**
- **Coordination between governments, multilateral agencies, private sector, and civil society**
- **Social and environmental sustainability**

CBSI Implementation and Follow-up



Where we are

- Steering Committee meeting – 2 meetings Feb & Sept 2005
- Project Launch - 6 Sept 2005

Where we are - Public Information

- Communication Strategy Draft
- Publication of Newsletter
- Coverage in International, Regional, and National media houses in the basin.
- Media Monitoring
- Awareness creation by participation in other NBI/ SVP activities.

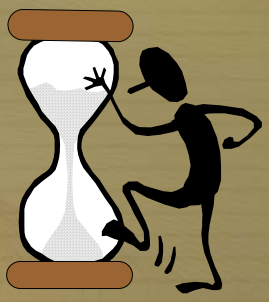
Where we are - Stakeholder Involvement

- Assessment of SAPs needs
- Social Issues in Power and Hydropower Projects.

Challenges to CBSI

Process Oriented

- Changing the paradigm from thinking water to thinking benefits.
- Historical mistrust
- Measuring benefits
- Cultural Values
- Geographic barriers



Opportunities for CBSI

- River Nile and its resources
- NBI and the SVP and SAPs promoting cooperation in the region.


NILE BASIN INITIATIVE
Initiative du Bassin du Nil
Thank you
Discussions,
Comments,
Questions
gmumbo@nilebasin.org

2.3 **Overview of the LVEMP, by Dickson Rutagemwa and Samuel Gor**

PART 1

Project Design

- Weak initial design
- it did not involved everybody in the project cycle e.g the implementing officers were not involved at
- No performance indicators put in place to monitor how the project was performing
- Weak flow of information between management and field officers
- Lack of feedback mechanism from RPSC

Implementation

- Field officers had no clear guideline on to how to carry their implementation
- There was no proper induction to the implementing officers
- Did not have clear specific objectives until a consultant came on board to guide and harmonize water quality studies in the region
- Frequent changes and bureaucratic financial disbursement and procurement which was taking too long affected the implementation
- Unsteady and inadequate flow of funds affected critical programme implementation
- Reliance on a single donor negatively affected the implementation
- Delaying in major procurement processes affected key areas e.g establishing a working laboratory
- Misconception of project objectives by politician and local communities making them develop negative attitudes towards project activities
- Project operations not independent (operates within existing policies

Lessons learnt

- Project design should involved everybody in planning stage
  - Clearly identify its objectives and state how they are going to achieved
  - Do situation analysis(human capacity, equipments, training needs assessments etc
  - Harmonize its methodologies and approaches
  - Incorporate M &E indictors

Achievements

- Promoted regional integration and interstate harmony for easy monitoring
- It has establish national and regional monitoring stations
- Harmonized methodologies regionally
- Improve data sharing within the region

Overview Water Quality Monitoring : LVEMP ,By D. K. Rutagemwa and S. Gor

PART 2

1.0 Introduction

***Note:**
Water quality management is indeed a great challenge as the lake is shared between three countries and its catchment drains five countries including Burundi, Rwanda, Kenya, Tanzania, and Uganda

The problems are increasingly complex that enhanced capacity for scientific assessment, monitoring and early warning have become very necessary so as to ensure timely solutions.
In response to the request of the lake Victoria riparian countries WB and (GEF) in 1996 approved funding for implementation of the first phase of the LVEMP.

LVEMP objectives (long-term).

- Maximize the sustainable benefits to riparian communities from using resources within the basin to generate food, employment and income, supply safe water, and sustain a disease free environment; And.

- Conserve biodiversity and genetic resources for the benefit of riparian countries in particular and the global community in general.

Objectives of the current first phase are to:

- Provide the necessary information to improve management of the lake ecosystem;
- Establish mechanisms for cooperative management by the three lake Victoria riparian countries;
- Identify and demonstrate practical, self-sustaining remedies, while simultaneously building capacity for ecosystem management (WB, 1996).

T**he water quality management component.**

The WQM objectives are to:

- Elucidate the nature and dynamics of the lake ecosystem by providing detailed information on characteristics of the waters of the lake;
- Improve management of industrial and municipal effluents, assess the contribution of urban runoff to lake pollution in order to design alleviation measures.
- Estimate the effects of changes in land use planning on pollution loads in the lake, and develop policies and programs to control non-point source pollution.

2.0 Water Quality Monitoring Program

- WQ monitoring

Long-term, standardized measurement and observation of aquatic environment in order to define status and trends.

Monitoring Objectives

- Identification of sources of pollution.
- A full understanding of the state of the lake including its physical, chemical, biological and sedimentary processes.
- Assessment of population and ecosystem exposure to pollutants and the associated risks.
- Establishing scientific basis for sound decision-making and policy development.
- Establishing the effects of changes in land use planning on pollution loads in the lake.
- Predicting consequences of various catchments and waste management policies, which will affect the loading to the lake.
- Determining the long-term trends to serve as indicators of water quality management efforts.
- Providing the necessary background for:

- Comparison of obtained data with historical data so as to evaluate changes in the physical, chemical and biological components of the lake. .

- Calibration of the water quality model and also enable the prediction of the future state of the lake using the model.
- Future monitoring programs.

- Public information.

.**Strategy**

- In order to address the deteriorating water quality it was necessary for the riparian states to cooperate.
- This required specialised capacity, which was at the time lacking for enabling countries to embark on challenges ahead.
- Among the capacities required or identified were human resource, laboratories and field infrastructure, monitoring networks, and databases development .

Strategies adopted to meet the Challenges

- Use of the available human and physical capacity
- Formal training.
- Regionally harmonized field data collection emphasised
- On-job training for various activities.
- Regional working sessions on data collation, verification and hands-on training.
- Regional Laboratory Performance Evaluation exercises.

Areas where capacity has been built

- Human resource
- Laboratory and equipment
- Infrastructure
- Database development.
- Modeling

Human resources

- Priority number one identified and undertaken was human resource development to strengthen the knowledge base of scientists
- The region has trained its nationals to various levels: 3 scientists trained to PhD level, 23 to MSc level and 2 to BSc level, 9 officers to Diploma level.
- These numbers are in addition to what the region already had.
- Various specialized short courses were conducted in-house and at various institutions. Also workshops, seminars and study tours were organised.
- Through capacity which has been built, LVEMP has in place specialists who are able to adequately assess, monitor and model environmental degradation in the catchment and the lake.

Resources

Personnel

- Training in laboratory and field procedures
- Field and Laboratory Procedures
- Selection of parameters
- Selection of methods

Laboratories

- Equipment
- Chemicals and Reagents
  - Field Equipment
  - Transport Facilities (Land & Water)
  - Communication Equipment

- Telephone/Satellite
- GPS Receivers
  - Field Equipment

Monitoring Network

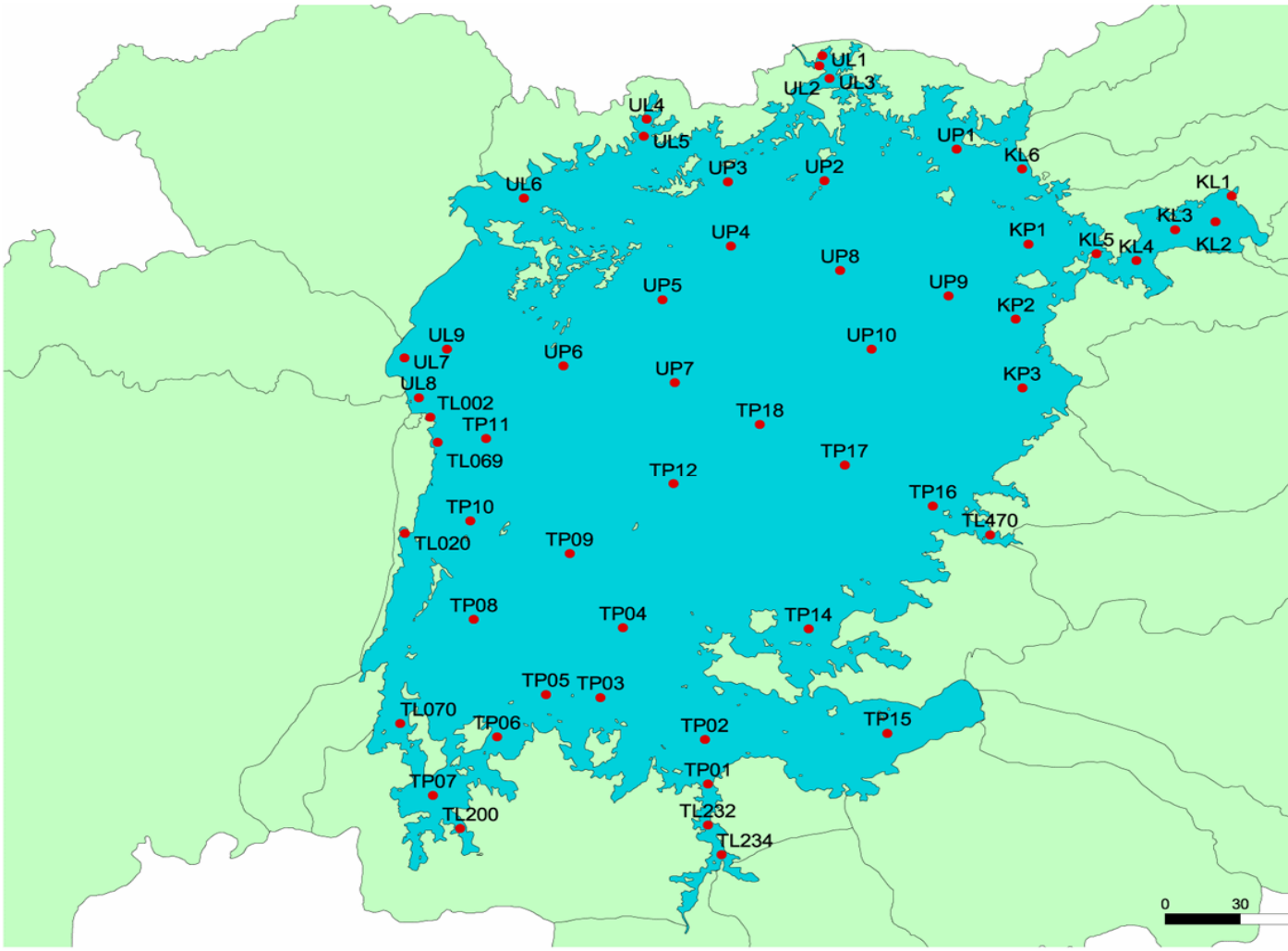
- In-lake Harmonised Network
- Impact
- Urban run-off
- Industrial effluents
- Rivers
- Atmospheric deposition

Data

- Process
- Interpret
- Information package

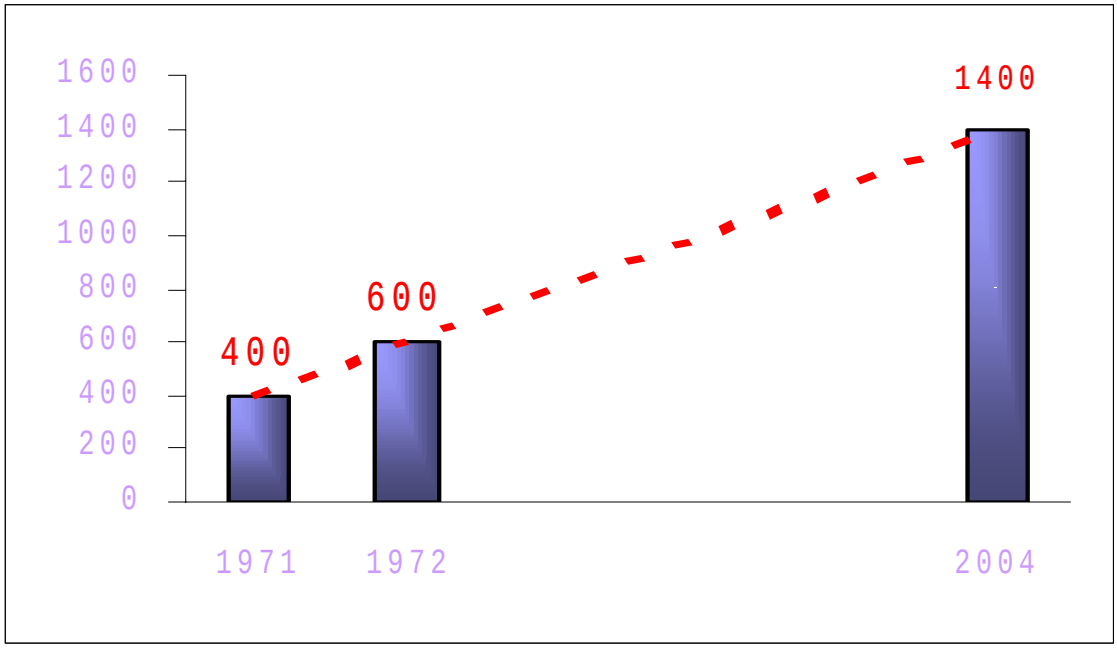
A functional Databases are in place

Note: Results disseminated to stakeholders through various avenues



QA/QC.
Intra/Inter Lab.
Performance Evaluation.
Note: Success of program hinges on quality data.
Monitoring Results (Example)

Suspended Sediment Load (Kilotons/year)
Trend at Nyakanyasi -Kagera River



The high suspended sediment loads carried by Kagera river from Rwanda and Burundi call for collaborative efforts to monitor the Kagera system

Problem
Major problem – Field installations/ deployed exp. Equipment Frequently vandalized

Solution
Vandalism on Field Installations is frustrating the Water Quality Management efforts. Thus sensitization of communities is being enhanced to involve their participation in protection of installation.

2.3.1 **Overview of ENTRO/ENSAP by Zeleke Chafamo**

Activities of the Eastern Nile Subsidiary Action Program
The ENSAP includes Egypt, Ethiopia and Sudan.
The primary objectives of ENSAP are to:

- Ensure efficient water management and optimal use of resources through equitable utilization and causing no significant harm
- Ensure cooperation and joint action between the Eastern Nile countries seeking win-win gains
- Contributing for the eradication of poverty and promote economic integration and,
- Ensure that ENSAP results in a move from planning to action

To realize the above objectives the following projects were identified Under ENSAP:

- Eastern Nile planning model sub-project
- Baro-Akobo Multi-purpose water resource development sub-project
- Flood preparedness and early warning sub-project
- Ethiopia-Sudan Transmission interconnection sub-project
- Eastern Nile power trade investment program
- Irrigation and drainage sub-project
- Water shed management sub-project

According to ENTRO's annual report all the above projects are under progress and are at different levels of studies
Institutionally, ENTRO :

- Providing overall policy guidance to the projects
- Coordinate the projects
- ensure sub regional as well as inter-sect oral integration of the entire ENSAP program

NTEAP
The objective of NTEAP is to provide a strategic framework for environmentally sustainable development of the Nile River basin and to support basin-wide environmental actions.
The identified projects under the NTEAP are :

- Institutional strengthening to facilitate regional cooperation
- Community-level land, forest and water conservation
- Environmental education and awareness
- Wetland management, and
- Water quality monitoring

Institutional strengthening to facilitate regional cooperation
This sub component is very important to create institutional capacity within the Nile basin countries to build technical foundation and enhance the sustainability of environmental and water resource planning and management.
At the moment, ENTRO is the major institution, which coordinate ENSAP. There are also national coordinators and working groups/units for each sub projects.

Community-level land, forest and water conservation
The program focus on:

- Regional institutional strengthen
- Problem identification
- Site selection

It is aimed to provide the basis for planning and implementing community-level actions to be financed by a micro-grant fund. So far the existing situation assessment study has been conducted and assessment report has been issued. The report identified major issues and priority areas to be considered by micro grant program.

Environmental education and awareness

The Component is aimed to deepen awareness and understanding of the community about the environmental issues of the Nile basin.

It includes establishment of national working groups to explore optimal approaches to development and dissemination of programs, with representation from key users of environmental education and awareness programs, including relevant government departments, educators and NGOs.

Current status

This component has already started and awareness creation workshops have been conducted.

The program focused primarily in higher education, high schools and environment related organizations etc

Use of communication media such as TV and Radio have been used

- **Wetland management and biodiversity conservation**

This component is supposed to promote understanding and awareness of the role of wetlands in supporting sustainable development and to improve management at selected transboundary wetland sites.

This component is planed to begin next year.

Basin-wide water quality monitoring

This component is believed to improve water quality of the basin.

Out puts will be:

- Established common analytical methods
- Established basin-wide wqm sites
- Improved capacity to monitor key parameters
- Selected parameters and frequencies of monitoring
- Accepted common reporting formats

So far this component has progressed according to the plan. It assessed baseline water quality situation and institutional capacity of the basin and proposed water quality monitoring sites and parameters to be monitored.

Recommendation how NTEAP strengthen linkages with ENSAP and other national organizations

NTEAP is one of the core programs of the Shared vision (SVP). It comprises several sub projects, which ultimately leads to the conservation and sustainable use of the Nile basin environment

One of the sub-projects under NTEAP is basin wide water quality monitoring program. WQM is very crucial issue to reveal the existing situation of the Nile water quality and to measure the effectiveness of the other projects under NTEAP and NBI. The success of all the projects under ENSAP and NTEAP can be directly or indirectly measured by monitoring water quality parameters. Therefore, it is important to create strong link between basin water quality monitoring and other ENSAP projects and responsible organizations at national and regional levels.

Nationally, basin water quality monitoring can be linked with: MOWR: since MOWR is responsible for water quality management and monitoring in national level, it can directly participate in water quality monitoring activity

EPA: as it is responsible organization for over all environmental quality controlling and monitoring, it can directly involve in water quality monitoring and issuing of environmental guidelines and ambient standard.

Addis Ababa and Arbaminch Universities: through research on water quality and bio-indicators which contribute for the water quality monitoring

Water bureaus of Amhara, Tigray, Oromia, Gambela and Benshangul :since they are situated with in the Nile basin and they are responsible for the management and monitoring of water quality in their respective regions.

Possible link with ENSAP/ENTRO

Basin water quality monitoring could be linked directly or indirectly with the Eastern Nile Subsidiary Action Projects as follow:**Baro-Akobo Multi-purpose water resource development sub-project**Since the project involves multi-purpose water resource development, it obviously affects the water quality. Therefore, to control water quality pollution it is essential to create link with water quality monitoring in such a way that the implementation of the project should consider water quality issues. Water quality monitoring program should set indicators, which can indicate impact of the project and undertake regular monitoring

Irrigation and drainage sub-project

- As irrigation development involves inputs like chemical fertilizers and pesticides, it will cause water quality problems. Hence, water quality monitoring program should give attention to irrigation and drainage sub project and propose indicators to be monitored regularly and intermittently and carry out monitoring activities and prepare water quality status reports.

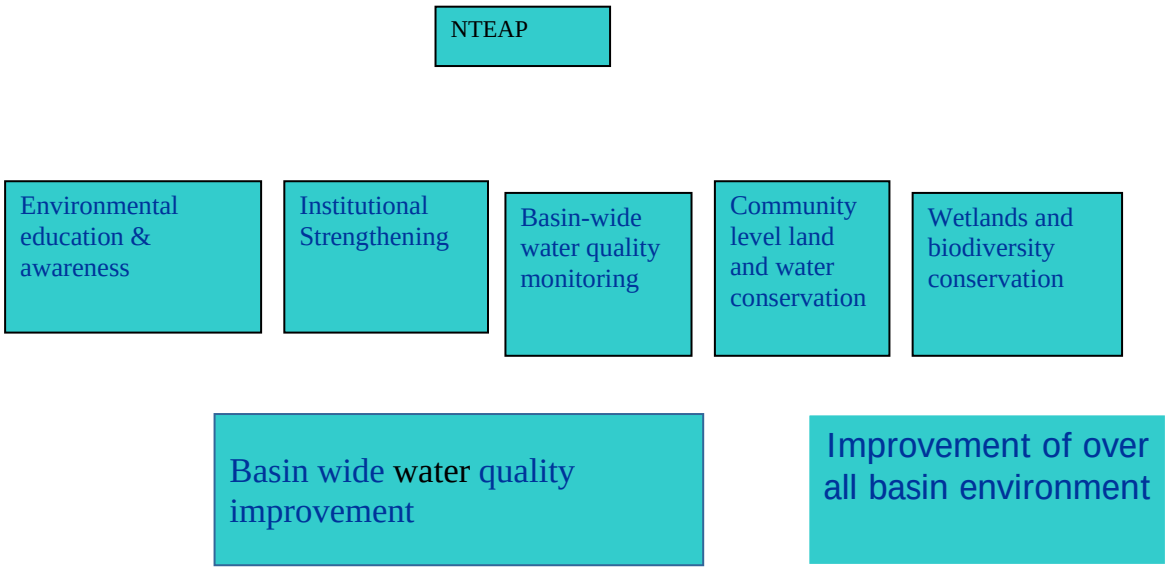
Water shed management sub-project

Proper implementation of Watershed management sub project will have positive impact on water quality, particularly by reducing silt load in reservoirs.

- Effectiveness of this project can be monitored by measuring water quality parameters such as silt load, total solids, nutrient load or turbidity in the water samples etc.

Environmental education and awareness

- This component can be linked with water quality monitoring through the exchange of water quality monitoring data. These data can be used for the purpose of awareness creation and demonstration. Basin wide water quality deterioration or improvement can be publicized through environmental education and awareness creation programs.
- Likewise, the success of environmental education and awareness can be inferred from an over all improvement of water quality.



2.4 Overview of NELSAP by John Nkongori and Florence Adongo

Report to be inserted later

2.5 Overview of the Achievements of NTEAP and the Water Quality Component by J. M. Omwenga

Highlights of the reporting period, Jan.- Dec. 2005

The major achievement of the Basin wide Water Quality Monitoring Component during this reporting period is the completion of the National Water Quality Monitoring Baseline Studies in all the nine Nile Basin countries. An equally major achievement is the successful recruitment of the International Consultant who successfully consolidated the nine national reports into a Regional Nile Basin Water Quality Monitoring Baseline Report. Enough copies of these reports are being made, for wider circulation and for dissemination of knowledge.

Main achievements

The Component was able to initiate action on the following planned activities for the period under review as follows:

- The completion of 9 National Water Quality Monitoring Baseline Studies in all the nine Nile Basin countries.
- The consolidation of the 9 National Baseline water quality monitoring reports into one Regional Nile Basin Water Quality Monitoring Baseline Report,
- The holding of 2 Regional Workshops of the Water Quality Working Group, held in Bujumbura, Burundi and in Entebbe, Uganda,
- The holding of 3 National Water Quality Monitoring and Enforcement Workshops, held in Mwanza Tanzania, Kinshasa, DRC and Bujumbura, Burundi,
- Initiation of the procurement of low cost Laboratory Equipment, for selected designated laboratories,
- Initiation of Basin Consultants to undertake studies on the status of data management,
- Initiation of Basin consultants to design quality assurance programs, and the develop training modules and materials, to be used for capacity building and awareness creation, Initiation of the commissioning of the international Consultant to develop Water quality Operational Manuals,
- Contacts have been made with universities to initiate research on Biological monitoring studies.
- The classification of Laboratory facilities, and based on this classification, funds for the procurement of low cost laboratory and field equipment has been shared out,
- Selection of specific laboratories and designating them as Nile Basin focal laboratories, while others have been identified as reference regional laboratories to assist those laboratories that are not well equipped,
- Transboundary sampling stations have been selected, which will form part of the larger Basin wide Nile Basin Water Quality Monitoring network.

Main Challenges

The main challenges facing the implementation of the Components activities continue to be:

- Low prioritization of water quality issues and low funding at the national levels in many countries, despite the fact that water quality monitoring is expensive,

- Weak institutional linkages and lack of coordination in some countries,
- Weak enforcement of laws and regulations on water and environmental management,
- Few well equipped modern laboratories in some countries,
- Only few accredited and internationally recognized laboratories and participating in regular Quality Assurance programs,
- Few trained and experienced staff,
- Weak technical capacity to undertake water quality monitoring,
- Lack of Water quality and environmental standards and guidelines in some countries,
- Poor data collection and management,
- No Trans boundary and basin wide data sharing modalities in place,
- No harmonized and common procedures for sampling and testing.

Procurement

The services procured, included the procurement of an International Consultant to consolidate the Water Quality Monitoring Baseline reports, and making payments to all the National Consultants who carried out the Baseline studies. Other procurements that are on going include, Procurement of Basin consultants to undertake, status of data management, and also to design water Quality Assurance program and to develop a training modules and materials. The procurement of low cost laboratory equipment has also been initiated, as well as that for the International consultant to prepare water quality operational Manuals.

Plans ahead

In order to address some of the challenges identified, the following activities have been planned for implementation during the period Jan- December 2006:

- Regional Meetings of WQWG (2 Meetings)
- Regional Trainings on Water Quality Measurements(2)
- Regional Workshop on Water Quality Monitoring(1)
- National Workshops on Water Quality Monitoring and Enforcement(6)
- Biological Monitoring Studies (to be initiated in 9 Universities)
- Printing and Translation of Baseline reports,
- Basin Consultants to evaluate examine and determine the status of data reporting, interpretation and database management to finalize their work,
- Basin Consultants to develop training modules and materials, identify key parameters and design water quality assurance programs, also to finalize work already started,
- International Consultant to Develop Water Quality Operational Manuals also to finalize the Manuals,
- Procurement of Low cost Field Equipment to be finalized.
- Support to countries to undertake country level eligible projects
- Increase networking with other SVPs and SAPs

CHAPTER THREE: Country Presentations

3.1 Burundi

Report to be inserted

3.2 DRC

Report to be inserted

3.3 Ethiopia

Ethiopia Country Presentation, by Zeleke Chafamo and Solomon Gabret sadik

Approved subsidiary action projects at the National level

- There are four hydropower and four irrigation projects which have been proposed by Ethiopia and approved by NBI
- Regarding the level of implementation they are at different level of study
- Creating and sustaining NTEAP Link with other SAP can be achieved
- Through establishment of WQM unit under each subsidiary action projects that can be contribute for the monitoring of the project impact on wq
- Through provision of enforceable standards and guidelines
- Transboundary WQM can be sustained
- If it linked with the existing water resource management of each basin country through the establishment of responsible unit for WQM as part of the routine activity
- Other National projects which can be supported by WQM
- Preparation of national domestic and industrial effluent standard
- Establishment of bio-indicator for biological water quality monitoring
- In general the awareness level about WQ is low in all levels except NGOs
- No national meetings/seminars to discuss WQ issues of the country
- No unit of coordinating transboundary water quality issues
- No protocol/information office to operate WQ issues
- No news letters publishing WQ issues

Awareness raising and information sharing

Awareness raising strategies

- Currently there is no WQ awareness raising strategy in the country level
- However, some NGOs who involved in water supply and health aspects teach about safe drinking WQ and sanitation

World Water day

- Water day has been celebrated based on the theme of each year

Links with other Initiatives

- It can be linked through establishment of reliable information management and communication system under the water resource planning project/NBI secretariat

Awareness or Equipment

- From our point of view more fund should be allocated for awareness creation than investing in WQM equipment

Biological Monitoring

- Biological WQM indicators are important for the sustainable monitoring of water quality pollution
- Concerning research, there is a University professor in limnology department of AAU who has shown interest in studying biological indicators for Nile water and he has contacted the national coordinator
- BIWQM can be carried out by allocating research fund for BIWQM can be carried out by allocating research fund for Universities/ interested researchers
- Universities/ interested researchers

Map Making

- Provided that there is a geo referenced water quality data and appropriate computer program, it is possible to create WQ map

3.4 Kenya

Kenya Country Presentation by Bernard Mulwa and Samuel Gor

Water Quality Monitoring Activities

- Trans boundary Water Quality monitoring can be entrenched and sustained by:
  - Review and adopt some of the existing relevant stations already in the national monitoring network as the monitoring points
  - Use existing facilities and personnel as a starting point in the execution of the trans-boundary monitoring

Transboundary Water Quality Monitoring

- Improve this existing capacity to meet the Trans-boundary monitoring needs and standards

- Standardize analytical methods for the agreed parameters
- Involve the local personnel as much as possible in the execution of the project in order to build sense or ownership for sustainability

- There should be regular regional consultative meetings for all the participating countries in order to:
  - share experiences and discuss successes and failures
  - Review Methodology and parameters monitored
  - Compare Results
  - Analyze data and produce regional trends

Geo- references of Selected Stations in Kenya

- Nzoia River at Rwambwa E34 05.450, N00 07.279
- Malaba River at Malaba
- Mara River at Keekrook E35 02.178 S01 13.380
- Gucha/Migori River at Wathong'er E34 15.629 S00 58.234
- Yala River at Daraja E34 08.401 S00 00.128
- Sondu/Miriu at Nyakwere E34 48.330 S00 21.267
- Lake Victoria at a station north of Rusinga island, KP1 close to Uganda Border on the lake
- Lake Victoria offshore Muhuru Bay, KP3 near Tanzania border

Awareness Raising Strategies

- Stakeholder dissemination workshops and seminars
- Provincial Administration Barazas
- Churches and other organized groups' meetings
- Scientific conferences
- Use of print and electronic media
- Publications of brochures and fliers
- For water quality issues, Scientific conferences have been used to inform the stakeholders of the findings
- Reports to and discussion with the target groups has also been widely practiced. This group mainly include Industries and Municipalities
- Other target groups are Farmers, NGOs, CBOs and other actors in the water sector

Levels of Awareness

- It is varied
    - Politicians attach little importance to quality and are mainly interested in the supply (quantity)
    - Senior Government Officers are only concerned with the water quality affecting human life and pollution from point sources
    - Private sectors are concerned about water quality mainly for their own use but in most cases do not mind about the resultant pollution from their activities
    - Private sectors are concerned about water quality mainly for their own use but in most cases do not mind about the resultant pollution from their activities
- NGOs and CBOs stress drinking water safety (quality) and develop point sources for provision of safe-water and also reduction of distance to water point by households
- Schools & communities - awareness still low and are only interested in availability of water at reasonable distance regardless of quality
- Schools & communities - awareness still low and are only interested in availability of water at reasonable distance regardless of quality

Word Water Day

- Celebrated on the 22nd March for the couple of years.
- A venue is selected for the celebrations and the a theme for the year.
- Celebrations are open forums through band march and plays. Other government ministries and public are invited for the occasion.

Funds for Awareness Creation

- It is important to allocate funds for awareness creation but not at the expense of investing in water quality monitoring equipment. It is the monitoring equipment which would generate data to be used for awareness creation and therefore should be given first priority.

Biological Monitoring

- There is an existing capacity within the school of environmental studies of Moi University to undertake biological indicators studies. Specific students and their supervisors can be successfully used for this purpose.

Map Making

- The capacity to make maps with available data is limited and capacity should be built particularly in GIS mapping and spatial data presentation

National Level projects to be supported by NTEAP

- Long term project for water Quality and Pollution Prevention within Lake Victoria Basin
- Project should carry out corrective measures for aquatic environment.

Subsidiary Action program

- Projects have been identified and proposals forwarded to the secretariate.
- Include :Water quality for the Lake Basin among others.

Coordination Unit

- Coordination Unit office is available at the Ministry Head quarters.
- New Division has been established to deal with trans boundary issues.
- Information office with staff is available.
- Water quality issues are both positive and negative are published in the Ministry Newsletter.

3.5 Rwanda

Rwanda Country Presntation by John Nkongori and Mardochee Birori

- The Shared Vision Programs is the brain Child of the Nile Basin riparian Countries (Burundi, Egypt, Ethiopia, Kenya, DRC, Rwanda, Uganda, Sudan and Tanzania) Which was created in 1998.
- The aim was nothing else but to exploit the vast water resources of the region suitably and equitably to ensure prosperity, security, eradication of poverty and promote economic integration. It is in this same year that the Nile Basin Initiatives was born which acts as the motor of all shared vision programs of the region.

Enhancement of Water Quality Monitoring

- **Q1: How do you think our shared vision program (SVP), should link with SAPs, and other in you countries?**
- **R1**: As it has been explained from the above introduction all the shared vision programs and Subsidiary Action Programs belong to the Nile Basin Initiative which is used a vehicle for the Nile Basin riparian country to engage in concrete activities for sustainable development, economic growth and regional integration.

Q2: Which SAPs have been approved at the national level, and what is the level of implantation?

- R2. Hydroelectric Power is the only one that has been approved and it is on the level of final for financial assistance.

Q3: **From your perspective what approach do you think NTEAP, should adopt, in creating and sustaining these linkages?**

- **R3**: As it has been mentioned in the first question this link is very crucial and the only to in force this, is to have regular consultative meetings and workshops. This requires money and planned agenda, for which NTEAP can provide. If can not do it alone then, NTEAP can sell the idea to the other six remaining projects of NBI, so that all can plan and put aside a budget together for such occasions
-

Q4: **How can trans boundary Water Quality Monitoring be entrenched and sustained?**

R4: This can be done through the exchange of information and comparing data during the workshops of the water quality working groups which meet twice a year.

But this can be more meaningful if there is permanent communication between those who share boundaries.

Q5: Can you give the Geo references of the trans boundary stations we identified?

Guided by the objectives of this Component , can you propose, national level projects that can be supported by the Component.

R6: The Government can be helped in sensitizing the population on the threat of using unclean water. The support can be through cinema shows, playing drama, Poems etc…

Which requires funds and materials to use

II. Awareness raising and information sharing on water quality issues.

Q1: What awareness raising strategies are in place?

- Programs on water pollution and prevention of it are occasionally passed on Radio and TV.
- Wetlands are being reclaimed by the Government.
- Water Hyacinth is being controlled
- Community is being sensitized on water pollution and is very active in all activities on all related Environment problems.
- Trees are being planted along the hills boarding wetlands to prevented soil erosion.

How are you creating awareness on water quality issues?

- The population and school children are sensitized on the problems caused by water pollution and are also involved in all strategies taken by the Government in curbing the pollution of water
- As it has been said above, this awareness is passed on Radio and TV as means of reaching all people in the Country.

Q3: What is the level of awareness on the importance of water quality at the Politicians level , Senior Government Officers, Private Sector, NGOs, CBOs, Communities and schools?

- Politicians, Senior Government Officers, Communities and Schools are very well aware on the importance of water quality.
- Private Sector and NGOs are mainly after their business, with exception of few such as GTZ, UNICEF, WHO, Rwanda Red Cross and International Red Cross

How often do you hold/ Ministerial Department / National Meetings/ Seminars to discuss water quality issues?

It is only on Water World day that we normally meet all stakeholders.

Q5: Do you have a unit coordinating trans boundary water quality issues?

R5: None apart from our group

Do you operate a protocol/ information office?

No

Do you publish water quality issues in Ministry newsletter?

No

Q8 : Is World Day for Water Celebrated and how?

R8: Yes it is celebrated.

- A whole week is taken passing on Radio and TV information about water quality control. Drama , Poems and Songs are played on the last day which is the world day of water,

What is the level of trans boundary data exchange?

None

Q10: What is the level of water quality information sharing among sector actors?

Very low

Q11: How can we link with LVEMP, ENSAP and NILESAP in awareness creation?

R11: By organizing consultative meetings and workshops on national and regional level. After several meetings they can choose how they can exchange information through internet.

Q12: What water quality awareness materials should be developed?

R12: Materials for drama and

Film development for all those who can not read. But for those who can read brochures and any reading materials can be provided.

Q13: More funds should be put into Awareness creation other than investing in water quality monitoring equipment? What is your view?

R13 Both are important and should be maintained but the degree of pollution in our water will be known if only there are instruments to monitor this pollution.

- On the other hand to know what type of pollution we are dealing with there should be equipment.

Therefore more money should spent in buying monitoring equipment.

III. Biological Monitoring of Nile Water

We propose Mr. MASHAKU Albert, Microbiologist, from the National University of Rwanda

Contact: Emmanuel MUHIGIRWA

National Coordinator

IV. Map making

Training and equipment needed

3.6 Sudan

Sudan Country Report by Nadia Shakak and Mohamed Ahmed Khalafalla

1. Enhancement of Water Quality Monitoring Activities

- Coordination with different institutes and organizations involved in water quality issue is essential
- Enables distribution of roles and activities
- Exchange of roles and activities
- Exchange of information and avoid duplication
- . Assessment of the existing **SAPs** is required to encompass the relevant vision projects.
- The importance of **SAPs** is admitted and many were approved but with low level of implementation.
- **Linking of NTEAP with the existing plans requires** :
- Coordination,
- Support of labs facilities
- Training
- Proper data management and exchange of information

Ongoing Activities

- UNICEF on going project (Water Environment and Sanitation).
- Plan Sudan (Water Supply and Sanitation)
- Water Supply Authorities (Water Quality Control)
- IRC (International rescue committee)

Trans boundary Water Quality Monitoring

- ***Within the project duration*** at least a regional quality base line should be established through:
- Selection of representative locations.

- Regular measurements (sampling and analysis) of the decided parameters.
- Exchange of information.
- Proper data management to enable analysis and interpretation and mapping.

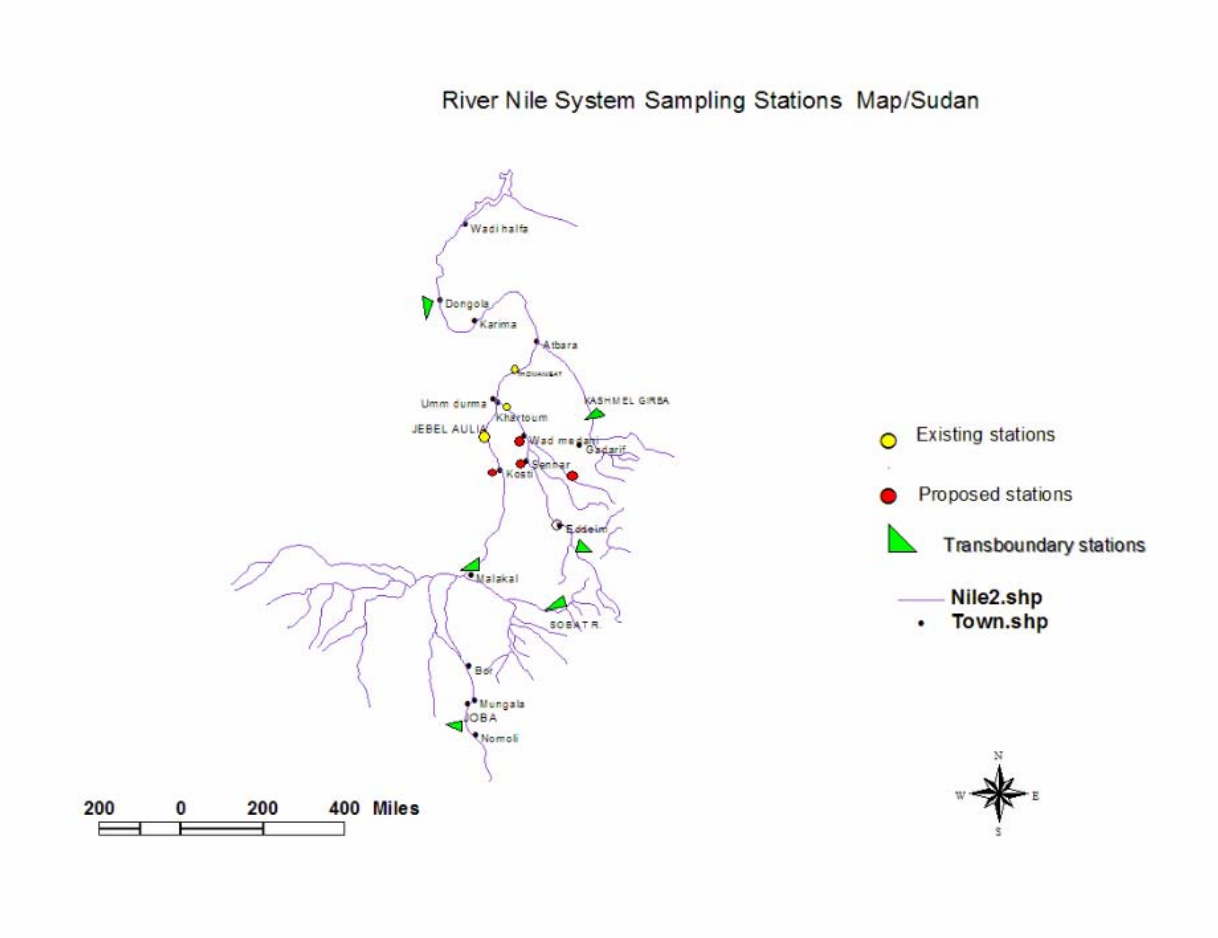
After Project Termination

- Follow up phase (extension)
- Country obligation.

Trans boundary Monitoring Stations

Coordinates in degree

Station Name	X	Y	River Name
Dongola	30.60	19.20	Main Nile
Juba	31.74	04.55	White Nile
Eddeium	34.94	11.02	B NILE
Malakal	31.60	09.57	Sobat (W Nile)
Khashm Algirba			R Atbara



- **Existing Stations**
- **Coordinates in degree**
- **Station Name X Y River Name**
- **Jabel Awlia 32.32 15.15 W Nile**

- **Khartoum 32.46 15.44 Junction (B&W Niles)**
- **Thomaniat 32.56 15.96 Main Nile**

Proposed Stations

- **Coordinates in degree**
- **Station Name X Y River Name**
- **Kosti 32.89 12.93 W Nile**

- **Wad Medani 33.30 14.19 B Nile**
- **Sinnar 33.50 13.79 B Nile**
- **El Rahad 34.90 13.10 River Rahad**

Awareness and Information Sharing

- Awareness on the importance of water quality issues is well acknowledged by all sectors including:
- Private sector
- Politicians
- Public sector
- NGOS
- Communities.
- Motivation is needed even for trainers.

Proposed Actions

- Water Day occasions (celebration).
- Water related conferences and the like. Lack of coordination between the involved institutes

Constraints

- Budgets shortage
- Poor communication and lack of accessibility to the targeted communities.
- Lack of trainers.
- Link between LVEM and ENSAP and Nile ESAP is the responsibility and the objective of the NTEAP, possibly through joined ventures exchange of experience, view and information.

Water Quality Documentation

- Thesis. MSc, PhD
- Departmental reports.
- Publications (few) local and international and connected with water related conferences.

Water Day Celebrations

- The Ministry of Irrigation and Water Resources in corporation with (UNICEF, UNESCO Chair, and Sudanese Environmental Societies and others) organizes the Water Day.
- In most conditions the program includes :

- Scientific papers,
- booster fairs
- Interviews with the responsible people by the different components of the Media.

Trans boundary data

- So far, only exchange of routine chemical analysis data with Egypt within the framework of the Technical Shared Organ between the two countries, the two sides look forward to the enhancement of this program within the NTEAP.

Awareness and Investment

- Governmental and foreign funds should be injected into water resources assessment and management (including equipment, monitoring and awareness creation).

- Revolving fund, private sectors and some NGOs (according to their function) can take care of water resources development.

Biological Monitoring

- The laboratories of the institute of environmental studies, university of Khartoum can asset NTEAP in executing a regular biological monitoring of the Nile water within the national level
- The research by hydro biological research unit (UK), launch has continued to function since 1956, and stop1986, there were no new scientific collaborations
- Reports on the work of Studies of water characteristic with relation to ecological studies includes:

  - Studies on phytoplankton diversity

  -Physical chemical characteristic of the Nile water

  -Blue and green algae

  -Water hyacinth

  -Ecology and distribution of bilharzias in the Gezira canal

  -The river Crabs

  -physiology of Nile fish and biodiversity

Map Making

- Supporting the existing facilities of Groundwater and Wadis Directorate (GWWD) enables production of water quality maps.
- (GWWD) gained a considerable experience in making similar maps.

3.7 Tanzania

Country Presentation by Dr. Hassani Mjengera and D. Rutagemwa

Enhancement of WQM activities

•Trans boundary WQ monitoring can be entrenched and sustained through sensitization of decision-makers and including it in national budget.

•The National Level Project to be by the Component is the National Water Quality Monitoring Programme within the Lake Victoria basin.

AWARENESS RAISING AND INFORMATION SHARING ON WATER QUALITY ISSUES

•Awareness raising strategies:

Workshops, Seminars, and Conferences.

Radio and TV programs.

Newsletter (Nyanza Review) and

Brochures.

Scientific publications

•**World Water Day**

Celebrated annually

•**Level of trans-boundary data exchange**

Marginally satisfactory

•**Level of WQ information sharing among sector actors:**

Marginally satisfactory

•**How to link LVEMP, ENSAP, and NILESAP:**

Through EAC put in place a mechanism for linkage.

•**WQ awareness material to be developed:**

•Newsletter, documentation films, brochures.

Geo-references of trans- boundary stations identified

Kagera river:

•Mumwendo 30.4683^{O} E, 2.6352^{O}S

•Kyaka 31.4185^{O} E, 1.2507^{O}S

Mara river:

•TZ/KE border 35.0163^{O} E, 1. 5487^{O}S

•Mara Mine 34.5541^{O} E, 1.5484^{O}S

•Tarime/Mugumu Bridge 34.5926^{O} E, 1.6036^{O}S

•Kirumi Bridge 33.9751^{O} E , 1.5287^{O}S

Existing Gaps

▪Lack of Gas chromatograph.

A functional WQM program is in place. However, according to parameters of Trans-boundary importance identified , labs in the Tanzanian part of the basin do not have capacity to handle pesticide residues.

Existing Gaps

•Faecal Coliforms(FC) missing from parameters of Trans-boundary importance. Their indication of feacal pollution call for inclusion n the list.

Existing Gaps

▪Apart from the LVEMP countries, there is lack of data and information exchange in the NB countries.

▪A wider monitoring program for the NB countries is lacking.

▪There is Lack of harmonised methods and procedures for comparability of results in the NB countries (except those implementing LVEMP).

Existing Gaps

▪Lack of Management Information Systems Officer (MISO) in the Tanzanian part of the NB. The MISO would ensure smooth implementation of data and information exchange with other NB countries.

Resources Required to fill the Gaps

•Chromatograph (for analysis of pesticide residues).

•Expert in Management Information Systems (MIS).

•Funds to facilitate harmonisation of methods and procedures for NB countries. Capacity to Improve

•Capacity to fill the identified gaps (within Tanzania) is inadequate. Thus,

•Assistance of donor community is necessary (required)
Who to carry out Improvement?

Improvement should be carried out by the Nile basin countries with assistance of donor community.

NTEAP Role

•To solicit funds for filling the identified gaps

•The project (NTEAP) can feasibly support management of funds made available by the donor community

Assessment of compliance with both receiving waters and effluent standards as stipulated in the water utilization (control and regulation) amendment act no. 10 of 1981.

3.8 Uganda

WATER QUALITY MANAGEMENT

IN UGANDA *Presented by* Adongo G. Florence, Eng. Badaza M

Presentation Outline

- **Legal Framework for WQ management**
- **Institution Framework**
- **Sector Coordination Arrangement**
- **Water Resources Management Department setup**
- **WQ division**
  - **Network Operations unit**
  - **Laboratory & QS units**
  - **Data Management unit**
- **Information Dissemination Strategy**
- **Future Plans**

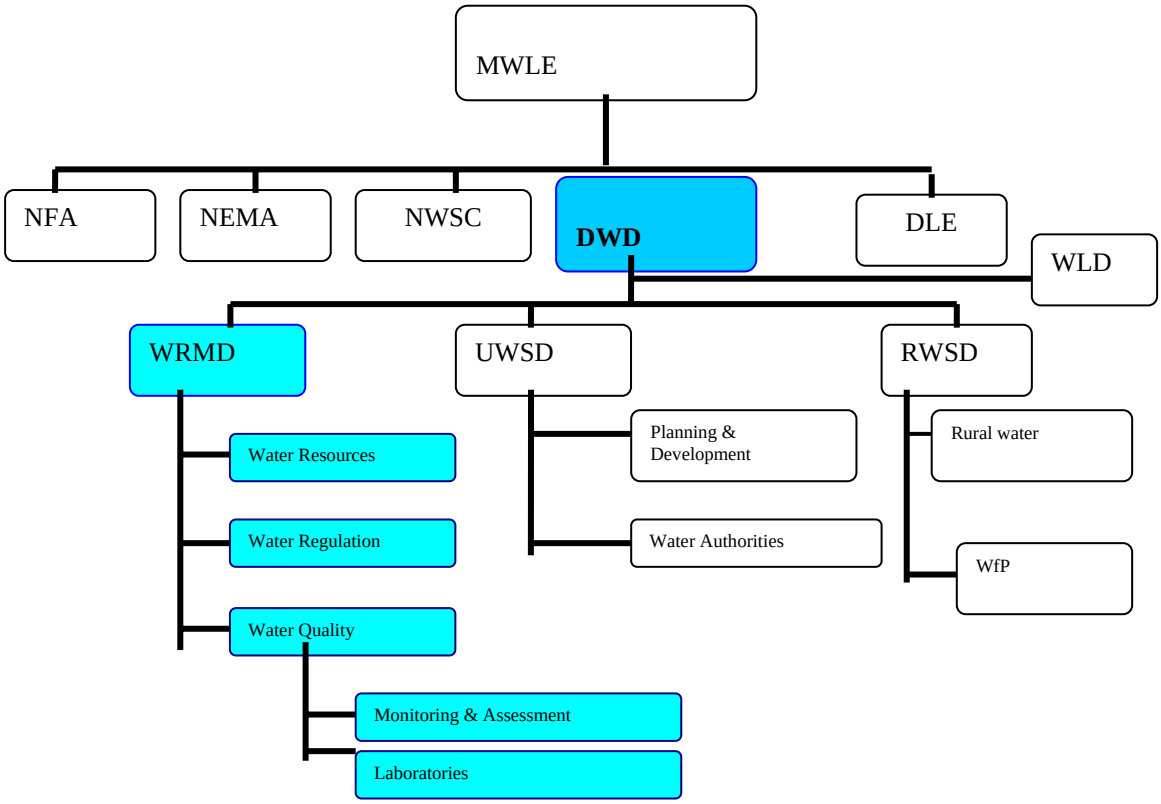
Legal Framework

- Constitution of the Republic of Uganda (1995)
- Water Action Plan (WAP) (1994)

- Water Statute (1995) now the Water Act cap 152
- Local Government Act (1997)

- National Water Policy (1999)
- A number of accompanying regulations

InstitutionalFramework



SectorCoordination

Water Policy Committee (WPC) as provided for in the Water Act Cap 152, article 9. Members are appointed by the minister.

The Water and Sanitation Sector Working Group (WSWG), chaired by PS/MWLE meets at least every quarter and provides policy and technical guidance for sector development in the country.

Water Resources Management DepartmentThe department is divided into three divisions :

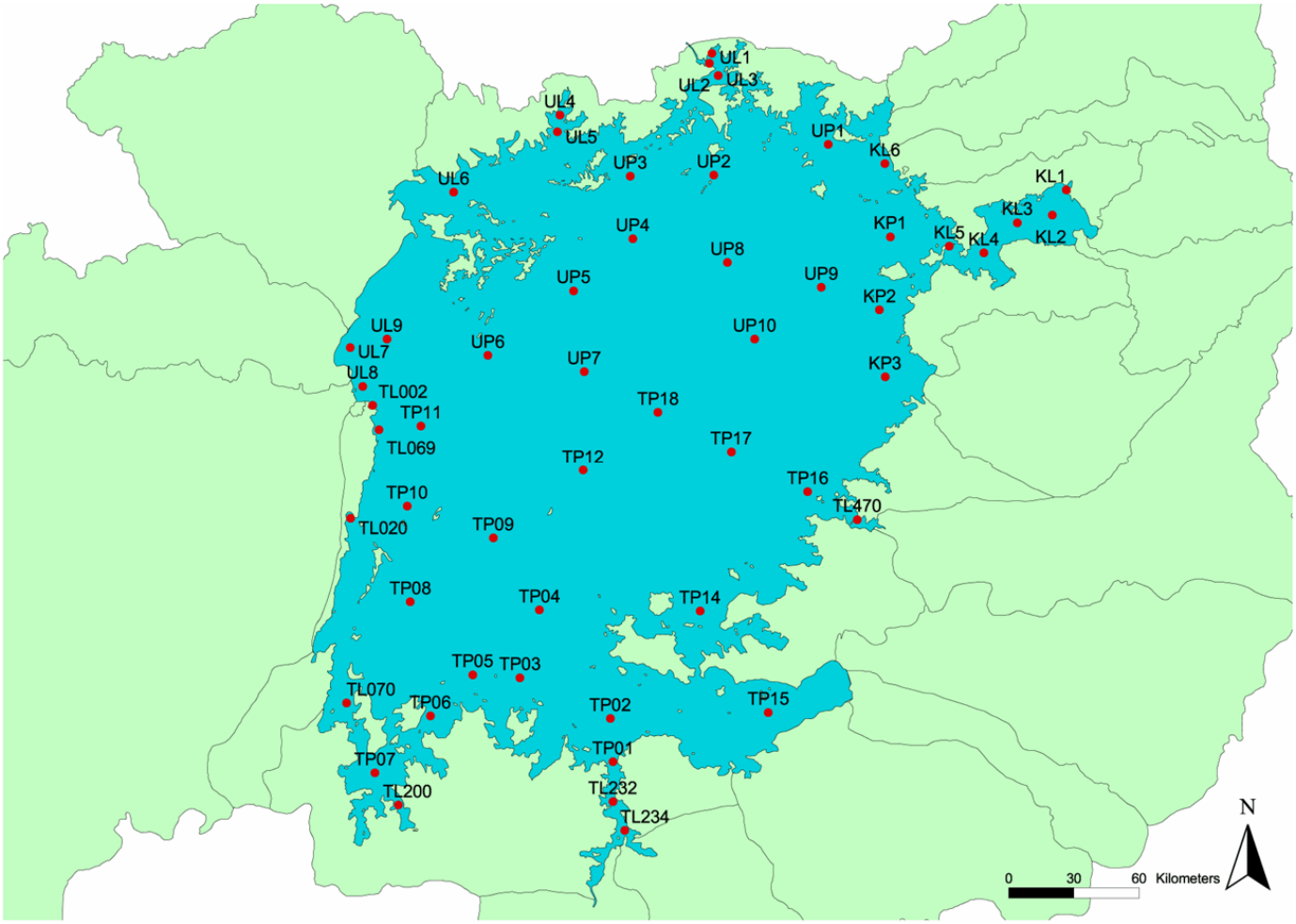
- **Water Resources Division**
  - **Assessment section**

    GIS unit
  - **Monitoring section**
    - **International Water Issues**
- **Regulation division**
- **Water Quality and Pollution Control Division**
  - **Network Operations**
  - **Laboratory Operations**
  - **Quality Control unit**
  - **Data Management & modelling Unit**

NATIONAL WATER QUALITY NETWORK


N
W
E
S
Operational station
50 0 50 100 150 200 Kilometers

LAKE VICTORIA SAMPLING NETWORK



AN ANALYST AT WORK IN THE LABORATORY

Quality Control Unit

Activities

- **Quality System documentation according to the requirements of ISO 17025**
- **Internal audits: e.g Transcription checks**
- **Organises for External audit e.g for Lab accreditation**
- **Supervises all aspects of the QS including staff training**
- **and equipment calibration**

Daily Quality Control

Data Management

❑GIS capability

❑QA and Processing of water resources data

❑Outputs

❑ - Maps

- Graphic presentations

Information Dissemination

DWD has a communications strategy. Common information dissemination methods include:

❑The Water and Sanitation Sector Performance Measurement report

❑The WRMD Annual Year book

❑Monthly Newsletters e.g The Water Update, The Water Herald

❑Newsletter Supplements

❑Water Use Regulation bulletin

❑Information Flyers

❑Radio & TV programs

❑Stakeholder workshops and sensitization

❑Exhibitions e.g on World Water day, World Environment day etc

Information Dissemination cont.

❑WRM Open day

❑Study tours and drama by Primary, Secondary and University Students

❑Industrial training for undergraduates

Future Plans

Catchment Management

WRM Sub Sector Reform Strategy recommends management of WR on catchment basis.

Future Plans

Biological Monitoring

The NWQMS

The purpose of the strategy is to provide a consistent and

systematic approach to water quality management

through the participation of all stakeholders at all levels.

The NWQMS recommends the establishment of WQ

Laboratories at various levels:

- **Central Laboratory (Reference Lab)**
- **Regional Laboratories at Catchment/Zone level**
- **Basic laboratories at the lowest level in districts and Water supply areas**

CHAPTER FOUR: Field Visits

4.1 Visit to the Entebbe, Ministry of Water Resources, Central Water Testing Laboratory

An Analyst in the Water Quality and Pollution ControlLaboratory, Entebbe, explains to a member of the Regional Water Quality Group, how an automated Nutrient Analyser works.

As part of the field visits that took place on 18th November 2005, the Regional Water quality working group visited the Water Quality and Pollution Control Laboratory, Entebbe, the Source of the Nile, Bujagali Falls and Jinja Water Works.

The Water Quality and Pollution Control Division falls under the Water Resources Management Department (WRMD) of the Directorate of Water development in the Ministry of Water, Lands and Environment. The Water Quality division is responsible for monitoring and assessment of the quality of all the water resources in Uganda. The

division operates a modern laboratory equipped with the state-of-the- art equipment, which includes an automated nutrient analyser, Atomic Absorption Spectrophotometer and a Gas chromatogram. The Laboratory is capable of analysing a range of physical, chemical, biological and microbiological parameters in water and wastewater. The laboratory procedures conform to ISO 17025 specifications.

Services offered by the Laboratory include but is not limited to the following areas:

- Design and operation of water treatment facilitiesDesign and operation of sewerage treatment works
- Commissioning of rural water supplies
- Monitoring for trends in surface and ground water quality.
- Determination of sediment loading and sediment transport in rivers
- Issuance of water abstraction and waste water discharge consents
- Limnological and aquatic ecosystem studies
- Environmental Impact Assessments and
- Hands-on training in various analytical skills

Bujagali

Bujagali falls is located about 6 km from the Owen falls dam on R. Nile at Jinja, Uganda. The river banks around this site are very steep measuring upto 18 m high or more. The main activities around the site are tourism, white water rafting, subsistence agriculture, subsistence fishery and sport fishing. The main type of fish are Nile perch and Tilapia.

The Bujagali falls has been proposed as a hydropower generation site. The Bujagali Hydropower project will be located 2.5 km downstream of the Bujagali Falls. The Project aims to generate 250 MW of electricity.

TheBujagaliFallsatJinja

The Source of the Nile

The Regional Water Quality Working Group at the Source of the Nile.

The Nile is believed to start from Jinja at what used to be called Rippon falls. The Rippon falls submerged in 1947 when the construction of the Owen Falls dam began. The first European to arrive at the source of the Nile was John Hannington Speke in 1862.

The main landuse types around the Nile at this point are subsistence agriculture, fishery and industries. The major industries include a brewery, textile, foam and fishery industries. In compliance with the Uganda wastewater discharge regulations, all these industries have wastewater treatment plants and some discharge their treated effluents into sewers and septic tanks for further polishing before discharging into the environment. Median values for water quality near the Owen falls bridge with respect to Electrical conductivity, pH, turbidity and dissolved oxygen are 86 μS/cm, 8.2 pH units, 4 NTU and 7 mg/litre respectively. With an average discharge of the Nile at the dam being about 100 million cubic metres per day, the Nile waters flow out of Lake Victoria with almost no pollution loads.

The main type of fish caught here are the Nile perch and Tilapia

CHAPTER FIVE: Group Discussions and presentations

5.1 Introduction to Group Discussions and formation of Groups, by John Omwenga

Mr. Omwenga introduced the Group Discussion topics and explained the focus of each of the groups. Based on individual expertise and knowledge on specific issues, he selected the Group leaders, and then asked the participants to join groups of their own choice

5.1.1 Group One

Basin wide Water Quality Monitoring Component
Group 1

Members: Ms. Adongo
Dr. F.J. Muyodi
Prof. Mafuka
Dr. F. Bagora
Mr. D. Rutagemwa

Discussion items:

- Trans-boundary water quality sampling and testing
- Information sharing and exchange
- Water quality maps

Sampling and testing

Why sampling? Where?

- Need to have harmonised network that answers the WQ issues in the basin
- Sampling sites have been proposed: are representative, media have been identified (water), based on the agreed criteria

Parameters have been proposed ie. Need to be flexible depending on the area / location

- Conservative and non-conservative ones
- Conservative – eg EC, TP, heavy metals
- Non-conservative – eg faecal coliforms, TSS

Parameters are adequate as proposed and need to be tested

Parameters are based on issues that were discussed in Egypt

Sampling Frequency (When and how?)

Minimum frequency: Rivers and lakes

Will be determined by the systems

Rivers - quarterly be the minimum but if possible monthly targeting seasons looking at flows ie low and peak

Flow measurements should be taken at the same time with sampling

Lakes – especially at river mouths minimum quarterly (monthly) and also at lake discharge points

How – logistics
Some lakes are very turbulent and need special sampling vessels for pelagic sampling (eg Albert)

Bi-annually but where possible quarterly

Land and water transport facilities: vehicles 4wds, mobile labs, dingies and outboard engines, communication facilities (eg satellite phones), sample storage facilities and accommodation in case of pelagic sampling

GPS for geo-referencing of the stations

Quality assurance and control during sampling

Harmonization of standards to give the same answers

Testing
On-site testing
In laboratory analyses done according to established quality system which should be harmonised all through

Inter-laboratory calibration

NB: all above will depend on competence of the staff

Information sharing and exchange (technical level)
Why and How?

Why- knowledge sharing, strengthening linkages, building trust

How - Importance of working sessions to review and share experiences, problems encountered, etc

Good E-communication systems eg email, data management information systems, infrastructure for ICT

Functional database systems must be in place.

Water quality maps

A regionally harmonised standard of the quality of the water we envisage / need (Water quality objectives should be taken into account)

Need to identify a GIS lab in the region

General Recommendation: training required in all these areas, ie sampling, analytical procedures, GIS, database and information systems

5.1.2 Group Two Presentation

1. **Topics for discussion**
2. **Awareness creation**
3. **Development of Awareness Materials**
4. **Communication**
5. **Water quality Operational Manuals**

AWARENESS RAISING

- Significant on conveying messages on water quality issues as well as quantity
- Bringing together all stakeholders and decision makers who play an active role in water resources protection from pollution.
- Optimal utilization of water resources and protection.

APPROACH

- Media – Radio, Television, Newspapers
- Community Sensitization through consultations
- Open public forums

- Education – curricular design in primary school, secondary schools and tertiary institutions
- World water related events/conferences/workshops/national public holidays
- World Water Day
- World Environment Day
- World Forestry Day
- World Desertification Day

EVENTS

- Local Drama
- Poems
- Plays and songs
- Posters, banners, t-shirts
- Cleaning and tree planting
- Flyers, brochures, stickers, stamps
- Demonstrations on good land use practices
- Prize awards for environmental good practices

MATERIALS DESIGN AND DEVELOPMENT

- Simple, Clear, relevant and specific.
- Needs for an expert for material design and development.

COMMUNICATION

- Need for a communication strategy
- National strategy for all stakeholders
- News letters
- Scientific publications
- National performance reports

TRAS BOUNDARY LEVEL COMMUNICATION

- Lead Specialist
- National Project Coordinator
- WQWG Members
- Through telephones, emails and faxes

WATER QUALITY MANUALS

- There is need to develop and harmonize the following manuals:
- Quality manual

- Field manual
- Procedure manual
- All these are for training purposes of new staff.

5.1.3 Group Three

GROUP 3 DISCUSSIONS, REPORTING AND PRESENTATION:
Members

Chair of the Group:	Nadia Shakak	Sudan
Group Members:	Solomon G Sadik	Ethiopia
	Ndayegamiye	Burundi
	Birori Mardochee	Rwanda

Topic: Transboundary pollution control, and Guideline for Biological Indicators

Objectives:

1- To pinpoint critical area within the transboundary watershed contributing to pollution, and to priorities the catchments for the potential severity of water quality problems
2- Development of Protocol for Transboundary pollution control
3- Adopt of Guideline for Biological indicators

Transboundary pollution controls before an Accident occur:

A-Point pollution:

-To aware or enforce projectors by national regulation and laws to control the their produced waste to the international permissible standards
-Regular monitoring of effluent by a national committee
-Management of random dumping of solid waste by incelaration (burn) in a save Sites

B-Non-point source

-Well and appropriate training program for safety agrochemical-Application

Transboundary pollution controls after an accident occur:

-Establishment of a permanent committee, and the members of these Committee should be from the neighbors' countries whose responsibility to investigate the case of pollution
-Affected Country with an accident immediate inform the committee
-The permanent committee should conduct cross-border environmental assessment
-After the assessment and investigation the committee report to the NBI, NTEAP, NPC,

and the national project coordinator has to report to the Ministries of water resources and the environment.

-Establishment of regulations, Acts, and agreement between transboundary countries to Control the case issues

-Inform the EPA and UN-Environmental agency in order to adopt international Conventions related to emergency issues

Guideline for Monitoring Biological Indicators:

-Transparency
-Blue-Green algae (Eutrophication)
-Phytoplankton growth and densities changes
-Fish biodiversity
-Zooplankton density change
-Temperature (measurement with depth interval to assess thermal stratification)
- Dissolved oxygen depletion or deoxygenating of the hypolimnion
-Nile Crabs densities
-Others

Implementation:

-Selection of university, institute, researcher, or expired Limnologist to conduct these activities, and prepared a proposal including the budget, and his work plan for execution, action plan, the qualified staff, and availability of equipment needed.

-The WQWG should coordinate and assist the identified expired, or researcher with the help from NPC, and WQLS

-Allocation of money or resources should be available with support from NBI, NTEAP To execute this program

5.1.4 GROUP IV PRESENTATION

Topics for discussion

1. **Action Plan 2006 – 2008,**
2. **Linkage with SAPs and other SVPs,**
3. **Country Level initiatives**

Members: Zeleke Chafamo- Ethiopia
Boniface Nyakageni- Burundi
Dr.Hassani Mjengera- Tanzania

Comments on Work plan 2006 and Action Plan 2006-2008

5.1.2 Basin – wide working group

4^{th} WQWG – Meeting

a) Discuss some specific issues analytical methods (analysis protocol)
b) Progress made on agreed issues during the 3^{rd} WQWG

c) Reports on water quality related issues in the country with specific reference to the Basin.

5th WQWG – Meeting

a) Discuss some specific issues analytical methods (analysis protocol)
b) Progress made on agreed issues during the 4th WQWG
c) Reports on water quality related issues in the country with specific reference to the Basin.

Water quality basin wide travel: Purpose, places to be visited and time frame.

5.1.3 Methods and training

Countries identify people to be trained; these MUST be those working with Water quality Units within the Basin. Especially **Burundi, DR Congo, Ethiopia and Rwanda**

Analytical equipment for each country and the training for water quality technicians should go hand in hand and can be conducted on the same venue.

Agree on QA programme this should be Establish QC/QA programme.
Efforts should be made countries to participate in the GEMS/Water Performance Evaluation Programme.

5.1.4 Building capacity

Regional training on procured laboratory equipment be combined with water analysis training for water laboratory technicians.

5.2 Awareness

5.2.1 Conduct study tour

Clarification required: when to be conducted where and for whom with what budget.

5.2.2 Develop data base format

Regional Trans boundary Water Quality Monitoring Workshop: Budget too small
Identification of stakeholders to attend the workshop

5.2.3 Nile Water Quality Monitoring

Procurement should not go beyond March 2006 with no delays otherwise it will affect the training schedules.

Country level eligible project appears twice under 5.1.4 and 5.2.3 giving a total of US$ 135,000

5.2.3 **Review and consolidate experience**

No budget and time frame for it.

Observations on Action plan

Some items though they appear on the action plan but no budget has been allocated to the activities. For example discuss on protocol, initiate trans boundary water quality sampling and testing.

When looking at the 2006 Action Plan the main plan of 2005 – 2008 was also taken into consideration hence the LWQS take on board views expressed on the 2006 Action Plan.

Linkage of water quality monitoring
Linkage of water quality monitoring activities with NBI – NTEAP: East African countries do have linkages with LVEMP thus other countries should follow this example. Furthermore be linked with existing water quality management structures of their countries with the Basin.

Guidelines on National Eligible Projects:
These be made available and countries should comment on them. Furthermore countries should be encouraged to prepare proposals and submit to the WQLS for funding consideration.

SAPs and SVPs should take into consideration basin water quality monitoring as part of the environmental monitoring activities by allocating funds.

CHAPTER SIX: Planned Activities for 2005

6.1 Presentation of the 2005 Work plan by John Omwenga

Presentation Summary

1. **Objectives of WQC**
2. **Sub-Components**
3. **Major Achievements 2005**
4. **Planned activities for 2006**
5. **Outputs for 2006 and Budget**

Objectives

- **Enhance national capacities for Water Quality monitoring**

- **Raise Awareness and support information exchange and sharing on trans boundary water quality issues**

Sub Components

- **Enhancement of national capacities for water quality monitoring**
- **Awareness raising and information sharing on trans boundary water quality monitoring**

Time frame: 5 years; 2.93 million USD

MAJOR ACHIEVEMENTS 2005

- 9National Water Quality Monitoring Baseline Studies finalized
- Regional Water Quality Monitoring Baseline Study report consolidated
- Water quality management decisions on parameters, management of transboundary pollution, support to laboratories, capacity building, networking and sampling and testing agreed on
- National WQME Capacities raised for over 100 participants in Tanzania, Burundi and DRC
- Classification of Laboratories, based on facilities, done.
- 4 Laboratories identified and agreed on as regional reference labs.
- Procurement of lab. Equipment, initiated in 5 countries
- 35 geo referenced transboundary Sampling Stations selected

CHAPTER SIX PLANNED ACTIVITIES, 2006

Activity 5.1.2 Establishment of a Regional Working Group

- Hold 4th WQWG Meeting , (May/June 2006)
- Hold 5th WQWG Meeting, (Sept. 2006)
- Hold 2National Water Quality Working Group and Stakeholders meetings (Feb and Nov.)
- Collaborate with SAP&SVPs& other initiatives in capacity building (Feb.- Dec.)
- Support National level WQ capacity building national Eligible projects (Feb. – Dec)
- Translate and Print WQ Baseline reports (Jan.- March)
- Basin wide and international travels (Mar.

5.1.3 Develop common analytical methods and conduct training

- Hire Basin consultants to develop Training modules and materials identify key parameters and devise water quality assurance program (Jan.-April)
- Hire an International consultant to develop common manuals for standard methods, for sampling, testing, and reporting; and a manual

  for field testing (Jan.- April)

5.1.4 Build capacity for water quality monitoring and enforcement (WQME)

- Hold 6 National WQME W/shops - Rwanda, Uganda, Sudan, Ethiopia, Kenya, Egypt (Feb. – Sept.)
- Hold Training Workshop on use of Procured Equipment and instrumentation

  (Sept.)

5.2.2 Develop compatible data reporting and data base formats

- Commission Basin Consultants to examine, evaluate and determine the status of data management prior to developing compatible formats (Jan - April)
- Hold 1 & 2nd Regional WQ Training W/shop (Mar.& July)
- 1st Regional WQM Workshop (Aug.)
- Prepare & Disseminate WQ awareness materials (Jun.- Nov.)
- Support WWD Celebrations (Mar.)
- Support WQ Awareness Raising national Eligible Projects (Mar. – Dec.)

5.2.3 Conduct trans boundary Nile water quality monitoring

- Select and agree on, trans boundary sampling sites (Feb.- July)
- Agree on protocol for trans boundary pollution (April – Nov.)
- Discuss and Agree on QA Program, and training materials (April- Sept)
- Agree on modalities of data sharing (Mar.- Nov.)
- Procure Low cost Field Equipment (Jan.- Sept)
- Initiate Bio-Indicator studies (Feb.– Dec)
- Initiate transboundary sampling and testing from agreed stations (Mar.- Dec.)
- National WQME capacities capacities of over 200 national officers enhanced
- Regional consensus reached on outstanding WQ management issues (Data, Pollution control)
- Over 30 officers trained on water quality measurements and on use of equipment
- National WQWG and Stakeholders agree on national actions of transboundary significance
- Status of Data data management, established
- Training modules and materials agreed on
- Nature and no. of national and transboundary QA Programs agreed on

OUTPUTS 2006

- WQ Operational Manuals for sampling, Laboratory and Field testing, prepared and disseminated
- Translated and disseminated RWQM Baseline Report
- List of Designated Nile Basin Laboratories
- List of Trans boundary sampling stations, parameters and WQ data
- Low cost Field Equipment procured and operational
- WQ Awareness materials, prepared and disseminated
- Modalities of data sharing and exchange agreed on
- SVP /SAPs linkages enhanced

Total Budget for 2006, USD 1.1M USD

6.2 Discussions on the Work plan

The Work plan was well received and was further discussed in the Working Group. Clarifications were made and the comments and observations made were noted

6.3 Summary of the Bujumbura and Cairo Decisions

1. Water Quality Parameters

The following parameters were proposed as being of trans boundary importance;

- Heavy metals and other toxic substances,
- pesticide residues,
- Total suspended solids,
- Total Dissolved Solids,
- Electrical conductivity
- Oil and grease and
- pH.
- BOD, COD, nutrients (nitrogen and phosphorus),

2. Criteria for identifying parameters of trans boundary importance

    - Persistence
    - Parameters that threaten the socio-economic status of the countries
    - Parameters that adversely affect human and animal health
    - Parameters that threaten the ecosystem
    - Ability to travel long distances without change and ability to accumulate

The following types of maps were suggested:

- Map showing trans boundary sampling stations
- Water quality indices
- Drainage system
- Geological and soil maps
- Topographical maps
- Maps of parameters of trans boundary importance, indicating status, trends, fate and impact and taking into consideration seasonal variations.

It was recommended that the Water Quality Atlas could be updated every two years but however, this could depend on the parameters.

The following factors are to be considered when selecting trans boundary stations:

- Activities on the catchments
- Movement patterns or fluxes of pollutants
- Drainage pattern
- Accessibility of Station and ease of coding

4. Data management

Uniform data reporting formats should be agreed upon urgently as well as the type of data to be collected. There also should be no hindrances to data sharing This can only be achieved if agreements are reached on common methods of sampling and testing by competent analysts

A Protocol on data sharing between countries should be considered in order to facilitate data sharing.

Training in Data management should be considered as a priority.

It was recommended to learn from and build on the already on going initiatives like the LVEMP.

5. Methods of sampling

The procedures outlined in the Standard Methods in the examination of Water and Wastewater should be adopted.

6. Selection of trans boundary Sampling stations

It was suggested that the stations should either be baseline or impact able to capture possible changes to activities on the catchments. However more detailed and agreed on criteria should be developed.

7. Laboratory facilities

All countries should strive to acquire modern basic equipment, and should be in a position to test for the following basic parameters:- Temperature, Conductivity, pH, Turbidity, Color, TDS, TSS and Dissolved Oxygen. A good laboratory is not necessarily one with very advanced instrumentation but rather a modest one that has established a tradition or a routine of testing for the basic parameters accurately.

8. Field Testing

There is need to assess the capacity of countries to effectively carry out Field testing. Both sanitary surveys and the use of biological indicators should be adopted as viable field tests that can easily be utilized even by communities as a means of quality control where laboratories are not available.

There is need to monitor or establish a few ground water stations because of the linkage between the two.

9. Capacity Building

There is urgent need to enhance capacity for water quality monitoring in the following countries; Burundi, Ethiopia, DRC and Rwanda. Egypt and Uganda should take a key role in this as they have fairly well established systems and practices.

There is also need to consider and propose solutions to other factors that impinge negatively on capacity, such as, lack of decentralization of water quality management from government to other stakeholders; lack of tailored water quality training modules, lack of water quality testing facilities

10. Environmental standards and guidelines

In those countries where they do not exist or are not being enforced, every effort should be made to improve the status, particularly in DRC, Rwanda, Burundi and Ethiopia

11. Community involvement

Although actual water quality monitoring may be too technical for communities, they may however be used with the help of NGOs in awareness campaigns. They may also be trained to carry out less complicated observations such as sanitary surveys or the use of biological indicators

No recommendations were made for methods of testing, quality assurance and accreditation as the items were deferred.

The issue of EIA should best be handled as a cross-border matter initially before attempting a basin wide approach.

An inventory questionnaire should be circulated with the aim of ascertaining both the technical and human resources capacity within the Basin.

The role of the private sector in water quality management should be discussed

Both the Central Laboratory for Environmental Monitoring and the Environmental and Climate Change Institute in Egypt are ready to assist in capacity building.

Many of these recommendations will be further refined through networking and where necessary some issues will be further discussed in the next Workshop

- Selection of NB focal Laboratory
- Procurement of support equipment
- Selection of TB sampling stations
- Assessment of NB laboratory facilities
- Transboundary pollution management
- Hazard assessment
- Manuals for use
- Water quality maps
- Biological indicators
- Networking
- Action plans

- Agreed on Laboratory Classification
- Agreed on sharing of funds for equipment
- Agreed on networking using emails and faxes
- Identified trans boundary sampling stations
- Agreed on protocol to handle transboundary pollution
- Adopted the draft Regional WQM Baseline report, and gave comments
- Identified focal NBI Laboratories

- Agreed on Regional reference laboratories

CHAPTER SEVEN: Conclusions and Recommendations

7.1 Recommendations

A Summary of Achievements during the past Year preceded the Group Recommendations

- The completion of 9 National Water Quality Monitoring Baseline Studies in all the nine Nile Basin countries.
- The consolidation of the 9 national baseline water quality monitoring reports into one Regional Nile Basin Water Quality Monitoring Baseline Report.
- The holding of 2 regional workshops of the Water Quality Working Group in Bujumbura, Burundi and in Entebbe, Uganda.
- The holding of 3 Water Quality Monitoring and Enforcement Workshops, in Mwanza, Tanzania; Kinshasha, DRC and Bujumbura, Burundi.
- Initiation of the procurement of low cost laboratory equipment for selected designated laboratories.
- Contacts are being made with universities to initiate research on biological monitoring studies.

Key Recommendations

Group 1 - Transboundary water quality monitoring, info sharing and water quality maps

- The stations earlier identified should be taken as transboundary sampling stations but Kenya, Rwanda, Tanzania, Burundi and DR Congo should reduce their stations. The countries agreed to reduce the number of stations and communicate the information
- Training required in all these areas, i.e. sampling, analytical procedures, GIS, database and information systems

Group 2 Awareness materials design and development and WQ operational manuals

- Need to bring together stakeholders and decision makers who play an active role in water resources protection from pollution and target optimal utilization of water resources and protection.
- There is need to develop and harmonize the manuals for Quality, Field and Procedure for training purposes of new staff.

Group 3 - Transboundary pollution control protocol and biological monitoring

Procedures to be followed before and after pollution were to be worked out and agreed on based on ideas proposed by the group

Protocol for handling transboundary pollution to be developed and circulated for comments and eventual adoption.

Group 4 - Action Plan, linkages with other projects and Country level initiatives

Work plan - Observations made, and clarifications and extra details will be given and communicated

Training - To be consolidated or merged

Procurement - To be harmonized and concluded, as soon as possible

Guidelines - To be circulated widely by TAC, PSC and NPC

Group 4

- Regional training on procured laboratory equipment should be combined with water analysis training for water laboratory technicians.
- There is need to strengthen linkages between the different water quality monitoring programs, including management structures, following the East African example.

Work Plan

World Water Day / Environmental Day Activities
SVP and SAP Coordination
WQWG -All to be and stakeholder involvement initiatives, to be elaborated on

7.2 Closing Remarks

This Session was chaired by the NPC, Uganda. Closing Remarks were give by Mr Omwenga who generously thanked all the participants, the partners, the government of Uganda, The WQWG members, the NPC, Nile-Sec, and the hotel management for the parts each one of them played to make the Workshop a success

A vote of thanks was moved by Mr. Benard Mulwa on behalf of his colleagues and he thanked his Ugandan colleagues for organizing a successful Workshop

Closing Speech by Dr. Festus Bagora

Dr. Bagora who stood in for the PSC member had the following remarks to make.

Distinguished participants,

Ladies and Gentlemen.

I am greatly honored to officiate at the closure of this 3rd Regional Water Quality Working Group of NTEAP workshop, which has been going on for the last three days. I am glad that the workshop has come to a successful conclusion, given the importance of the issues you have been dealing with and the intensity of work that was involved.

Allow me to start by reminding you dear participants, about what the Hon. Minister of State for Water in Uganda said the other day when she was opening this workshop. She

pointed out the importance of the River Nile in the Nile Basin region. In particular, this is true of the many millions of people who depend on the river for their livelihoods and development. This offers the opportunity to cherish and sustainably utilize the river basin resources for the common good of all.

The importance of good quality water in the Nile basin is paramount for our people and for development, but along with this, the issue of water quantity in the various water catchments of the drainage basin has to be considered. Of recent many unsustainable human activities such as deforestation and inappropriate agricultural activities have increased the risk of reduced amounts of water flows in the basin, and this is detrimental to the future prosperity of the peoples of the basin. We need to do some thing about this, and the NTEAP has a lot to contribute.

The Nile River and its tributary should be viewed as an aorta or perhaps to put it in another way, an umbilical cord of the region, which if harmed, can threaten our livelihoods. Therefore the Nile basin should be protected and managed well or else we run into great trouble.

The trans-boundary nature of the issues pertaining in the Nile Basin will no doubt will be best solved through cooperation, collaboration, networking and actually planning and working together on all matters that affect utilization of the Nile Basin resources.

What has been discussed by you in the last three days of hard work should be translated into on ground actions to cause the desired impact. We should ensure that from here, all the stakeholders are involved in the implementation of agree actions, each one fulfilling the prescribed roles and responsibilities.

Distinguished participants, I wish at this point to request that this Water Quality Working Group looks seriously the reality of the time frame set for implementation of the "Basin-wide Water Quality Monitoring Project", which is supposed to close at the end of the year 2008. There is need to consider whether all the activities planned will have been implemented, to realize the project objectives and outputs. Let me haste to warn that temptations to rush activities in order to complete the implementation in the time set may be at the expense of quality output and impact.

In this regard, the participants may consider requesting members of the Project Steering Committee in their your respective countries, to bring up this matter at the forthcoming NTEAP Steering Committee meeting due to take place in Khartoum between 12-14th December 2005. That is, the Steering Committee to consider seriously making a recommendation on the need for unrushed implementation of project activities and possible extension of the project beyond 2008, should the need arise. Certainly, the next Steering Committee Meeting is the right time for bringing up this matter.

I wish commend all of you for your professional inputs and commitment to this workshop, which is yet another land mark in the course of the NTEAP implementation.

Finally, I would like to sincerely thank all those people who have used their skills and time to organize this successful workshop. In particular, I wish to recognize the valuable contributions to the following organizers:

John Omwega from NTEAP office in Khartoum who has taken the lead in organizing the workshop, Florence Adongo and Eng. Badaza of the Water Resources Management Department who are the key host and have equally played important roles in the organization, and Apophia Natukunda the National Project Coordinator, who despite having come on board into the project only recently, has ably managed to play her role in the organization. Thanks a lot for a job well done.

May I end by thanking all of you participants for sparing these three days from your very busy schedules, to come and participate in this workshop that is of great importance to all of you. I hope you have enjoyed the hospitality of Ugandans and the country's natural environment. I wish you a safe journey home, and encourage you to stay a little longer if you wish to enjoy more of Uganda.

I now take this opportunity to declare the 3rd Regional Water Quality Working Group of the NTEAP officially closed.

ANNEXES

ANNEX1: List of Participants

	NAME	POSITION	COUNTRY/INS.
1.	Mr. John Omwenga	WQLS	PMU
2.	Ms Apophia Atukunda	NPC	Uganda
3.	Mr. Boniface Nyakageni	WQWG	Burundi
4.	Mr. Joseph Ndayegamiye	WQWG	Burundi
5.	Prof. Mafuka Mbe- Mpie	WQWG	DRC
6.	Mrs Marie Rose Mukonkole Mayele	WQWG	DRC
7.	Mr. Zeleke Chafamo	WQWG	Ethiopia
8.	Mr. Solomon Gebretsadik	WQWG	Ethiopia
9.	Mr. Mohamed Khalafalla Ahmed Ali	WQWG	Sudan
10.	Ms. Nadia Babiker Ibrahim Shakak	WQWG	Sudan
11.	Dr. Hassani J. Mjengera	WQWG	Tanzania
12.	Mr. Dickson K. Rutangemwa	WQWG	Tanzania
13.	Mr. Benard Mulwa	WQWG	Kenya
14.	Mr. Samuel Gor	WQWG	Kenya
15.	Mr. Birori Mardochee	WQWG	Rwanda
16.	Mr. John Nkongori	WQWG	Rwanda
17.	Dr. Florence G Adongo	WQWG	Uganda
18.	Mr. Mohamed Badaza	WQWG	Uganda
19.	Dr. Festus Bagora		Uganda
20.	Mr. Jackson Kitamirike		Uganda
21.	John Obubu		Uganda
22.	Mr Mohamed K Amed		Uganda
23.	Mr. Wamalwa Sowed		Uganda
24.	Mr. Etimu Simon		Uganda
25.	Mr. Richard Angualia		Uganda
26.	Ms Lilian Idrakua		Uganda
27.	Ms Grace Twesigye		Uganda
28.	Mr. David Muhairwe		Uganda
29.	Dr. Fredrick Muyodi		Uganda
30.	Ms.Juliet Lagua		Uganda
31.	Mr. Tom Wako		Nile-Sec
32.	Mr. Gordon Mumbo		Nile-Sec

ANNEX 2: Workshop Agenda

AGENDA FOR 3RD REGIONAL WATER QUALITY WORKING GROUP WORKSHOP, ENTEBBE, UGANDA 17TH -19TH NOVEMBER 2005

DAY ONE, THURSDAY, 17TH NOV. 2005.
NILE TRANS BOUNDARY ENVIRONMENTAL ACTION PROJECT

Registration **8.30– 9.00**

Session 1 - Opening Session **9.00 – 10.30**

1. Introduction and welcome remarks by Ms Apophia Atukunda (NPC)
2. Official Opening
   - Remarks by John Omwenga, WQLS
   - Remarks by PSC member
   - Remarks by TAC member
   - Remarks by the World Bank Representative
   - Remarks by the UNDP Representative
   - Remarks by the Executive Director of NBI
   - Opening Speech by the Hon. Minister of State for Water, Hon. Maria Mutagamba

Session 2 - Background Presentations **11.00 – 13.00**

1. Presentation and adoption of the Agenda and Program by, WQLS, John M Omwenga,
2. Overview of the NBI, SVPs and SAPs, by Tom Wako
3. Overview of the Confidence Building and Stakeholder Involvement Project by Gordon Mumbo, RPM CBSI
4. Overview of the LVEMP, by Dickson Rutagemwa and Samuel Gor
5. Overview of ENTRO/ENSAP by Zeleke Chafamo
6. Overview of NELSAP by John Nkongori and Florence Adongo
7. Overview of the Achievements of NTEAP and the Water Quality Component by J. M. Omwenga

Session 3 - Country Presentations **14.00 – 17.00**

1. Country Presentations by WQWG members
2. Presentation of the Component's Work plan for 2006 and review of the Decisions of the Cairo and Bujumbura W/shops by J. M. Omwenga
3. Discussions on Presentations and Formation of Working Groups

DAY TWO- FRIDAY 18TH NOV. 2005

Session 4 -Group Discussions and Field visit 8**.30-13.00**

1. Group Discussions 8.30-13.00
2. Field Visits (Water Lab& L. Victoria) 14.00-17.00

DAY THREE- SATURDAY, 19TH NOV. 2005

Session 5 - Group discussions, reporting and discussion on Way forward
9.00-12.00

1. Group Discussions
2. Group presentations

Session 6 - Way forward and Closing 12.00-13.00

1. Presentation of Summary of Deliberations
2. Recommendations/ Way forward
3. Closing Ceremony

ANNEX 3: Workshop Program

3RD REGIONAL WATER QUALITY WORKING GROUP WORKSHOP, ENTEBBE, UGANDA17TH – 19TH NOVEMBER, 2005

DATE : 17th – 19th, November, 2005
VENUE : Windsor L. Victoria Hotel, Entebbe, Uganda

OBJECTIVES

- Review of and adoption of agreed decisions of the Cairo and Bujumbura Workshops and progress in implementation of the Component's activities,
- Discussion of the 2006 Regional Water Quality Component Work plan
- Review the Proposed 2005 – 2008 Action plan
- Discuss specific Trans boundary and Basin wide water quality management issues,
- Visit water quality testing and environmental monitoring facilities,

EXPECTED OUTPUTS:

Workshop Report with agreed upon actions on trans boundary water quality management issues, way forward and consensus on planned activities for 2006.

DATE/TIME	ACTIVITY	RESPONSIBILITY
16/11/05	**Arrival** in Entebbe and check in Windsor Hotel.	NPC/WQLS
17/11/05	**DAY ONE- THURSDAY**	
8.30 -9.00	**Registration**	National Project Coordinator (NPC)
9.00 -10.30	**Session 1-Official Opening**	**Chairperson- PSC Member**
9.00 -9.10	Welcome Remarks,	By NPC
9.10- 9.20	-Address by WQLS	John Omwenga, WQLS
9.20- 10.30	-Remarks by the WB Rep. -Remarks by UNDP R. Rep. -Remarks by the Executive Director of NBI, -Opening Speech by the Hon. Minister of State for Water	
10.30-11.00	**TEA BREAK**	
11.00-13.00	**Session 2 -Background Presentations**	**Chairpersons- Dr. Hassani Mjengera/ Prof. Mafuka M.**
11.00- 11.10	Review and adoption of the Program	WQLS, John Omwenga
11.10-11.30	Overview of NBI, SVPs and SAPs	T. Wako, Program Officer, NBI
11.30-11.50	Overview of CBSI Project	G. Mumbo, RPM
11.50-12.10	LVEMP, Challenges and Achievements	Dr. Orach-Meza, National Executive Secretary, LVEMP,

		Uganda.
12.10-12.25	Overview of the Water Quality and Ecosystems Management Component of LVEMP	Dickson Rutagemwa and Samuel Gor
12.25-12.40	Overview on ENSAP and NELSAP activities	J. Nkongori and Z. Chafamo
12.40-13.00	Discussions	

13.00 – 14.00	**LUNCH BREAK**	

14.00- 17.00	**Session 3- Country Presentations**	**Mr. Bernard Mulwa/ Ms. Nadia Shakak**
14.00-15.30 Each presentation ten minutes.	Uganda Tanzania Sudan Rwanda Kenya Egypt Ethiopia DRC Burundi	
15.30-16.00	Discussions on presentations	
16.00-16.30	Review Cairo and Bujumbura Decisions & Presentation of 2006 W/Plan	WQLS

16.30-17.00	**TEA BREAK**	

17.00- 18.30	Formation of Working Groups and G/ Discussions	NPC/ WQLS
	END OF DAY ONE	

18/11/05	**DAY TWO- FRIDAY**	

8.30-17.00	**Session 4- Group Discussions and Field Visit**	
8.00-10.00	**Group Discussions** **Group 1**- Trans boundary water quality sampling and testing; information sharing and exchange; water quality maps **Group 2**- Awareness Creation materials design and development; WQ Operational Manuals **Group 3**- Trans boundary Pollution control; Biological Monitoring	

	Group 4- Action Plan 2006-2008; Linkages with SAPs and other SVPs; Country level initiatives	

10.00-10.30	**TEA BREAK**	

10.30-17.00	Field Visit to Ministry of Water Laboratory, Entebbe, and Jinja, Source of the Nile	Dr. Florence Adongo and Mr. Mohammed Badaza

19.00-21.00	**RECEPTION**	NPC/WQLS
	END OF DAY TWO	

19/11/05	**DAY THREE-SATURDAY**	

8.30-12.00	**Session 5- Group discussions, reporting and discussion on way forward**	**Prof. Tarik Tawfic/ Mr. Z. Chafamo**
8.30-9.30	Group discussions	
9.30-10.30	Group presentations Group 1 Group 2 Group 3 Group 4	

10.30-11.00	**TEA BREAK**	

11.00-13.00	**Session 6-Discussions on Way forward and Closing Ceremony**	
11.00-12.00	**Discussions on way forward/Recommendations**	**Chairpersons- Prof. Mohammed Abdelkhalek/ Mr. J. Nkongori**
12.00-13.00	Closing Ceremony Remarks by NPC Remarks by WQLS Remarks by TAC Member Vote of thanks Closing remarks by PSC Member	Chairperson NPC/TAC

13.00-14.00	**LUNCH & DEPARTURE**	

ANNEX 5: List of Transboundary Sampling Stations

SUDAN

Trans boundary Monitoring Stations

Coordinates in degree

Station Name	X	Y	River Name
Dongola	30.60	19.20	Main Nile
Juba	31.74	04.55	White Nile
Eddeium	34.94	11.02	B NILE
Malakal	31.60	09.57	Sobat (W Nile)
Khashm Algirba			R Atbara

TANZANIA

Geo-references of trans- boundary stations identified

Kagera river:

- Mumwendo 30.4683^{O} E, 2.6352^{O}S
- Kyaka 31.4185^{O} E, 1.2507^{O}S

Mara river:

- TZ/KE border 35.0163^{O} E, 1. 5487^{O}S
- Mara Mine 34.5541^{O} E, 1.5484^{O}S
- Tarime/Mugumu Bridge 34.5926^{O} E, 1.6036^{O}S
- Kirumi Bridge 33.9751^{O} E , 1.5287^{O}S

KENYA

Geo- references of Selected Stations in Kenya

- Nzoia River at Rwambwa E34 05.450, N00 07.279
- Malaba River at Malaba

- Mara River at Keekrook E35 02.178 S01 13.380
- Gucha/Migori River at Wathong'er E34 15.629 S00 58.234
- Yala River at Daraja E34 08.401 S00 00.128
- Sondu/Miriu at Nyakwere E34 48.330 S00 21.267

- Lake Victoria at a station north of Rusinga island, KP1 close to Uganda Border on the lake
- Lake Victoria offshore Muhuru Bay, KP3 near Tanzania border

UGANDA

ETHIOPIA

EGYPT

ANNEX 6: List of NTEAP, designated Focal Laboratories

Beneficiary / Focal/Designated Laboratories for the NTEAP WQ Component

Country	Laboratory/ Lab. Details	Contact Person
Egypt	Central Water Quality Testing Unit, Cairo and the High Dam Laboratories, Aswan Location: Cairo City Address: P O Box Tel: Fax: Email: .	Name : Prof. Mohammed Abdel Khalek Tel : Cell : email
Uganda	Ministry of Water Lands & Environment Directorate of Water Development, Water Quality & pollution Control Laboratory, Entebbe Location: Entebbe City Address: P O Box 19 Entebbe Tel: +256 41 321 342 Fax: +256-41-321368 Email: wrmd@dwd.co.ug or dwd@dwd.co.ug	Name : Florence G. Adongo Tel :256-41-322440 Cell : 256-78-662205 Email : adongo.wrmd@dwd.co.ug
Kenya	Ministry of Water and Irrigation, Laboratory, Kisumu Location: Kisumu City Address: P O Box 1922 Tel: 057-2024779 Fax: 057- 2023085 Email: lvempwater@swiftkisumu.com	Name : Samuel Gor Tel : +254 (0) 57-2024779 Cell : +254 733991531 Email : saagorke@yahoo.com

Tanzania	Ministry of Water and Livestock Development, Mwanza Location: Mwanza City Address: P O Box Tel: Fax: Email: wq.mza@lvemp.org	Name : Mr. Dickson Rutagemwa Tel : Cell : Email : dicksonrutagemwa@hotmail.com
Sudan	Ground water and Wadis laboratory, Khartoum Location: Khartoum City Address: P O Box 15006 Tel: 249-83225740 Fax: 024983236276 Email: gww_infocent@sudan mail.net	Name : Nadia Babiker Shakak Tel : 0918046925 Cell :0249 Email :shakak@alumni.itc.nl
Ethiopia	Ministry of Water Resources Laboratory, Addis Ababa Location: Ethiopia City Officer/contact person is Abiy Girma, team leader of the water quality control section Full address is: Abiy Girma, POBOX 5744	Name : Zeleke Chafamo E-mail, girma_abiy@yahoo.co Mobil phone 251911249208
DRC	REGIDESO GOMA Location: Goma Address: P O Box Tel:243 0998611317 Fax: Email: mihatanobintu@yahoo.fr	Name : MIHATANO BINTU c/o MAWALALA Augustin Tel : Cell : 243 0997592965 / 243 0815096618
Burundi	REGIDESO, Bujumbura Location: Bujumbura City	Name : Joseph Ndayegamiye Tel : 00257 22 2066 Cell : 00 257 952 745

	Address: P O BOX 2616 BUJUMBURA Tel: 00257 22 2066 Fax: Email:nday_j2002@yahoo.fr	
Rwanda	Regidiso, Kigali Location: Kigali City Address: P O Box Tel: Fax: Email:	Name : Mardochee Birori Tel : Cell :