



**EAST AFRICAN LEGISLATIVE ASSEMBLY**

**REPORT ON THE SEMINAR ON WATER  
LEVELS IN LAKE VICTORIA**

**KISUMU HOTEL, KENYA  
30 JUNE – 1 JULY, 2006**

**Clerk's Chambers  
AICC Complex  
5<sup>th</sup> Floor  
Ngorongoro Wing  
Arusha  
Tanzania**

**September, 2006**



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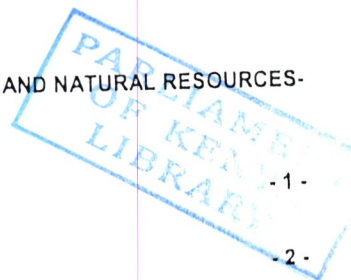
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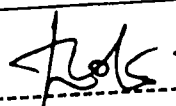
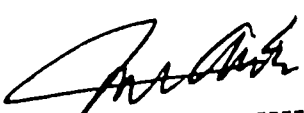
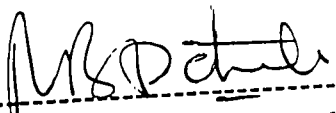
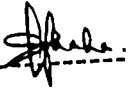
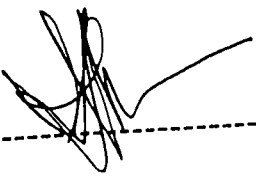
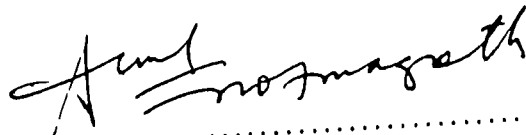
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AGRICULTURE, TOURISM AND NATURAL RESOURCES

1. Hon. Lydia Wanyoto Mutende – Chairperson-----
2. Hon. Mahfoudha A. Hamid-----
3. Hon. Prof. Margaret J. Kamar-----
4. Hon. Sheila Kawamara Mishambi-----
5. Hon. Calist A. Mwatela-----
6. Hon. Maj. Richard B. Ddudu-----
7. Hon. Hulda S. Kibacha-----
8. Hon. Ochieng G. Mbeo-----
9. Hon. Dr. Norman Sigalla.....

## SEMINAR ON WATER LEVELS IN LAKE VICTORIA

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### *Introduction*

#### ~~Background~~

Lake Victoria is the second largest inland fresh water body in the world and the most critical trans-boundary natural resource linking the three partner states which form the east African community. The Lake Victoria is shared by the three countries at 49% for Tanzania, 46% for Uganda and 6% for Kenya. In order for the lakes potential to be realised there is need for cooperation from the riparian governments who are the principal stakeholders.

The lake is a major economic resource supporting an estimated 30 million people in the three states with an estimated annual gross domestic product (GDP) of US\$ 30 billion. Its main economic activities are;

- 1) It is a major waterway linking the three partner states
- 2) It is a source of hydroelectric power
- 3) Is a source of water used for domestic and commercial purposes
- 4) Moderates the micro-climate in the surrounding area
- 5) Is the largest inland water fishing sanctuary
- 6) Has a rich biodiversity of local, national and international importance
- 7) Is a major tourist attraction.

However there has been a significant drop in the levels of water, up to 1.94M by December 2004, in the lake which threatens the above activities and other potential uses of the lake. It is from this background that the seminar was convened to seek an understanding of the causes, consequences and possible remedial actions which can be adopted in managing the situation.

As part of their tour to Kenya, EALA Members convened a seminar in the Lakeshore City of Kisumu to learn more about the causes of the alarmingly receding water levels of Lake Victoria with a view to instituting a regional policy and legal framework to reverse the trend. Apart from EALA Members, participants in the seminar included Members of Parliament from the Partner States National Assemblies, representatives of governments, research bodies, Universities, development agencies and civil society organizations (see the list of participants attached) . The one-day meeting came with practical recommendations on reversing the current trend.

## OPENING REMARKS BY HON. SPEAKER EALA

Hon Mwatela introduced the Members of East African Assembly (EALA) and welcomed Members from the respective National Assemblies of Kenya, Uganda and Tanzania, thanking them for honouring the invitation. In a prepared speech read by Hon Mwatela, the Speaker reminded the MPs from the national assemblies that they were EALAs electorate, and this will definitely be a great opportunity to consult them on the issues they would like deliberated in the Regional Assembly. Their participation in this seminar will add value to the future operations of the EALA and the entire Community. He lauded the respective Speakers for allowing Members to attend the seminar at short notice and during the budget session of the three Assemblies.

The Speaker went on to extend special gratitude to the Kenya government through the Kenya National Assembly for her wholehearted support to the EALA, and the entire Community. For every year since inauguration of EALA five years ago, the Kenya National Assembly has been sponsoring a tour of Kenya by EALA members. As a result, the Members are now much more familiar of Kenya more than any other Partner State. He hoped that the support will continue in the coming term.

This particular seminar has been necessitated by increasing concern on the drop in Lake Victoria water levels at an alarming rate. Lake Victoria, which is the largest of all African lakes, is probably one of the most populous regions in the world. The lake provides food, transport, and electricity to more than 30 million people. It has a number of scenic isles known for their beautiful landscape, health resorts and sightseeing places. Availability of abundant prehistoric remains around the lake indicates the early development of agriculture. There are a number of coastal towns such as Kisumu, Entebbe, Bukoba, Mwanza and Musoma connected with each other by ship routes and also to the cities of the Indian Ocean coast by railways and roads. The Owen Falls Dam constructed in 1954 on the Victoria Nile supplies electricity and water for various uses in Uganda and Kenya.

There's however concern that the lake is currently experiencing severe threats that are impacting negatively on the socio-economic and the intrinsic values highlighted above, thus contributing to losses of income estimated to 60 million USD annually.

Whereas most lakes draw their waters from a broad drainage of rivers, streams and ground water, Lake Victoria is unique because most of its water comes from rain that falls directly over it. For this reason the lake is very sensitive to rainfall its water levels fluctuating depending on how much rainfall it receives in a particular year.

The drop in Lake Victoria water levels means that more than 30 million people's livelihood in Uganda, Tanzania and Kenya are under threat. The lake provides an inexpensive way of transporting goods between the three countries. Its fish are an important source of food. The recession of the waters since 2003 has left ferries stranded

far from their jetties, fishing boats mired in mud and towns running low on water. The three major ports on the lake are threatened with closure. The number of locomotives plying has also come down, meaning that the volume of trade in the area is bound to reduce drastically.

These threats and impacts need to be managed. The institutions at national and regional levels and existing legal frameworks provide the opportunities to address the threats. They need to be fully engaged. The challenge therefore for resource managers and regional bodies like the East African Legislative Assembly is to understand what current changes in water levels in Lake Victoria mean for the lake, the people and the surrounding region. In this way, we would be able to reverse the trend while at the same time improve the local economy and welfare of the peoples of East Africa.

Those who matter in the management and administration of the Lake are all here today. This seminar is therefore expected to come up with definite recommendations on policy and legal framework to sustainably manage the waters of Lake Victoria and thereby reduce poverty levels in the Lake Victoria Basin.

**OFFICIAL OPENING BY HON JOHN KOECH (MP), MINISTER FOR  
EAST AFRICAN COMMUNITY AND THE CHAIRPERSON,  
COUNCIL OF MINISTERS OF EAC**

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The Minister, who is also the Chairman of the East African Community Council of Ministers, expressed hope that the outcomes would greatly contribute to the worrying trends of the Lake's falling water levels and provide a solution to arresting the trend. Lake Victoria is major shared resource for over 30 million people in East Africa residing in the Lake Victoria Basin. Apart from that, there are stakeholders beyond the basin as far off as Egypt in the North of Africa.

He noted that the past three years have seen a sharp increase in the levels of Lake Victoria by more than one metre. Some observers intimate that the fall is attributed to a high volume of discharge at Owen Falls while others observe that the recent droughts have been the main cause.

A study undertaken recently entitled "*Study on Water Management of Lake Victoria*" brings out the following observations:

- Drought accounts for 45% of the decline while over-discharge at Owen, Kiira and Nalubaale account for 55%;
- Operators of the Owen Falls Hydropower have not adhered to the *Agreed Curve* principle thereby releasing more water than agreed;
- From previous studies, conducted, the Owen Falls Dam is over-dimensioned;
- The cost-benefit analysis of the operations of the cost dam, must be taken into consideration in arriving at a decision on the proposed Bujagali Dam

The above issues should form the basis upon which participants may wish to base their frank discussions in order to come up with solutions to the problem.

The declining level of water of the Lake presents a number of challenges, some of which are:

- Extinction of marine life and breeding grounds for fish
- Cutting off of wetlands and bays where fish such as tilapia migrate to during the breeding
- Fall of electric power generation
- Adverse effects on water levels
- Adverse effects on the docks for vessels plying the Lake

The many experts and interest parties present in the workshop should explore ways and means of preserving Lake Victoria which should include:

- Equitable and reasonable utilization of water resources

- Protection and conservation of the basin and its ecosystems
- Sustainable development of natural resources
- Sustainable development and management of fisheries resources
- Sustainable agriculture and land use practices within the Lake Victoria basin

Out of the realization that the Lake is a critical resource for over 30 million people, the East African Community came up with the Protocol for Sustainable Development of Lake Victoria Basin which was signed on 29<sup>th</sup> November, 2003. The Protocol aims at providing guidelines to partner states cooperation in the sustainable development of Lake Victoria.

Apart from the Protocol, EAC has also established the Lake Victoria Basin Commission (LVBC) which is based in Kisumu and deals with issues on the sustainable development of Lake Victoria Basin. EAC has also acquired a vessel R.V. Jumuiya, which will assist in carrying out research on the Lake. The vessel is fully equipped with navigational aids to go anywhere in the Lake and get information regarding fish stocks, water quality, safety of navigation by other vessels etc.



**PRESENTATION BY HON. LYDIA WANYOTO MUTENDE, CHAIR,  
STANDING COMMITTEE ON AGRICULTURE, TOURISM AND  
NATURAL RESOURCES**

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**REPORT OF THE TOUR ON ASSESSMENT OF THE IMPACT OF DECLINING  
WATER LEVELS IN LAKE VICTORIA BY THE STANDING COMMITTEE ON  
AGRICULTURE, TOURISM AND NATURAL RESOURCES**

**Presented by**

**Hon. Lydia Wanyoto Mutende**

**CHAIRPERSON**

The Committee observed that the Lake was experiencing severe threats that were impacting negatively on the socio-economic and the intrinsic values.

The key threat was declining water level. As a result of that, for example

- Ships could not berth smoothly to the quays in most of the ports and in all cases ships calling on these ports were beaching.
- Electricity production at Jinja declined by 30% in December, 2005
- Fish landing structures constructed to ensure good quality of fish had been rendered non-functional and;
- The intakes of water treatment plants in Kisumu, Entebbe, Mwanza and other beach town had been severely affected resulting into a decrease in the amount of water in supply.

Given the fact that the three countries share Lake Victoria, the East African Legislative Assembly as the legislative arm of the Community needed to understand these threats and how their impacts could be addressed. It was with the foregoing background in mind, the Committee of Agriculture, Tourism and Natural Resources, which handles matters of Lake Victoria on behalf on EALA, made a tour of the Lake Victoria to assess the impact of the declining water levels.

During their tour, the Committee visited various offices and officials in Mwanza in Tanzania, Kisumu Kenya, and Jinja in Uganda. A number of issues came up as a result of the tour which necessitated the following recommendations:

**RECOMMENDATIONS / WAY FORWARD**

- There is need for a closer attention on the lake level trends by all the riparian states in order to address the causes of the declining water levels.
- Decline in catchment inflows is a direct result from decline in forest cover, unsustainable farming practices, destruction of wetlands, and overgrazing. All

- these lead to increased siltation in the lake. To improve the situation, sustainable land use practices and use of efficient energy saving stoves should be promoted.
- Tree planting should be made compulsory and be backed by laws.
  - Reforestation and afforestation by the Government and local communities should be aggressively undertaken.
  - The three Governments should start a special programme on tree planting for forest reserves in order to preserve the natural vegetation.
  - All the three Partner States have legislations that regulate cultivation on river banks and catchment areas. These laws should be enforced immediately.
  - Necessary controls on extraction of water at Jinja should be enforced so that the Nile outflow is pegged back to the lake levels (agreed curve) as had been earlier.
  - The Governments should put in place early warning systems and build capacity of the hydrological and meteorological institutions with a view of improving the monitoring and prediction of weather patterns to detect events such as drought and floods.
  - Sensitization of various stakeholders across the board should be a continuous undertaking and a formal linkage should be established. The outcome of the various conferences and workshops on the lake should be put to use.
  - The role of LVBC was very crucial in the management of the lake and therefore needs to be strengthened with the emerging issues on the lake.
  - It is important to have regional regulatory body empowered to regulate maritime safety within the lake, set standards, regulate security machinery, seaworthiness of vessels, monitor pollution, and lay down strategies in case of floods.

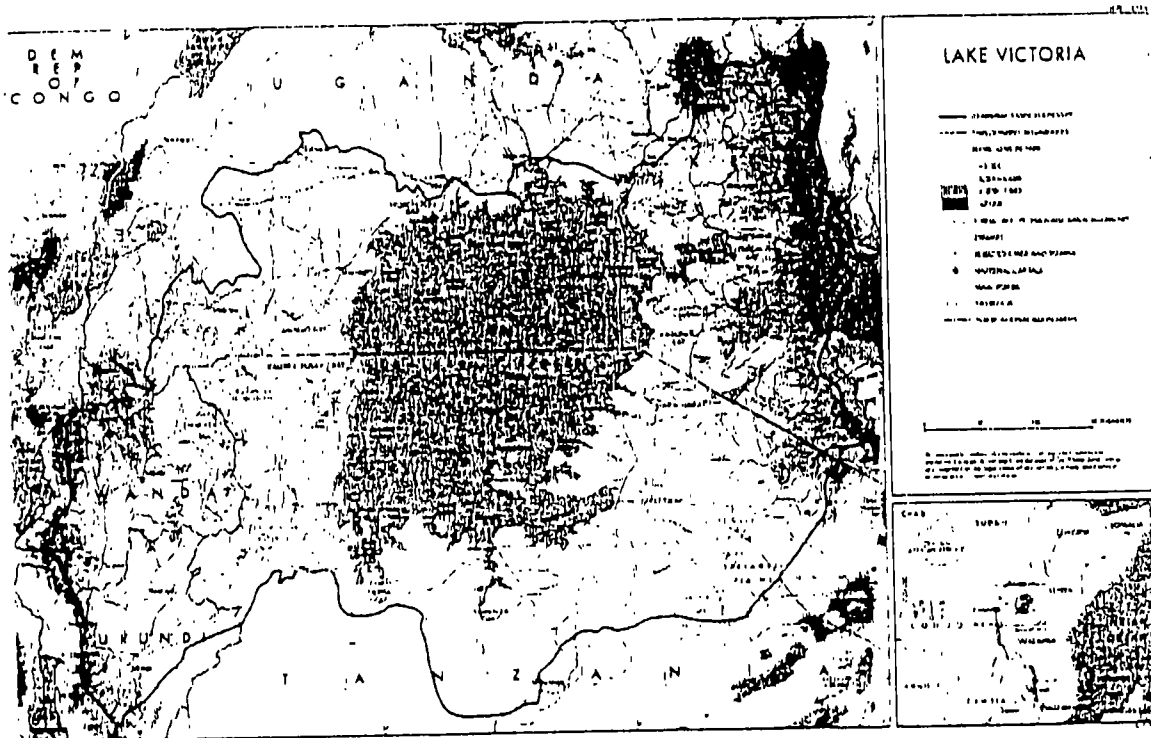
**PRESENTATION BY DR. LADISY K. CHENGULA, SENIOR  
NATURAL RESOURCES MANAGEMENT SPECIALIST, THE  
WORLD BANK**

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**LAKE VICTORIA BASIN MANAGEMENT  
THREATS AND CHALLENGES OF RECEDING WATER LEVELS**

**Presentation by Ladisy K. Chengula, Ph.D  
Sr. Natural Resources Management Specialist**

**The World Bank**



### Facts about Lake Victoria Basin

- Population – 30 million; of which 3 million depend on the Lake for their livelihood
- Lake Basin countries – Kenya, Tanzania, Uganda, Rwanda, and Burundi
- Lake Victoria – Second largest freshwater body in the World at approx. 68,800 Km<sup>2</sup>
- Lake Victoria shares – Tanzania 49%; Uganda 46%, and Kenya 6%
- Fish exports – valued at over US\$300 million

## LVEMP Long-term Development Objectives:

- 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;
- Conserve biodiversity and genetic resources for the benefit of the riparian communities, as well as the global community; and
- Harmonize national management programmes in order to achieve, to the maximum extent possible, the reversal of increasing environmental degradation.

The management of Lake Victoria basin is influenced by a number of factors. Chief among them are the complex land and water resources relationships; vulnerable and fragile ecosystems with special management needs; integrating, longer retention periods, and complex responses to pollutants; threats to ecological integrity; competition between; resource user groups, and among riparian countries and climate change phenomena. Others are political and socio-economic environment.

## Lessons-Learnt From LVEMP

- Applied research is critical for understanding environmental threats of the basin ecosystem
- Basin-wide approach is necessary for addressing the environmental concerns
- Institutional capacity and framework for managing trans-boundary resources is weak
- Financial sustainability is untenable
- Community involvement/participation is critical especially for watershed management
- Donor coordination is weak

## The Main Environmental Threats of the Lake Victoria Basin

1. **Declining water levels:** Caused by persistent drought; and over-abstraction of water for power generation
2. **Unsustainable fishing practices:** Changes in fish species biodiversity (500+ to three dominant spp); and declining stocks of Nile perch fishery
3. **Increasing water pollution:** Leading to changes in lake chemical and bio-physical characteristics; eutrophication and its effects; nutrients balance problem; and health problems
4. **Resurgence of water hyacinth:** As a result of declining water level; re-introduction from Rwanda/Burundi through Kagera river; and failure of the weevils to establish in riverine water hyacinth
5. **Increased wetlands degradation:** Because of declining water level; and agricultural and urban development
6. **Watershed degradation:** Due to unsustainable agricultural practices e.g., cultivation on slopes, and deforestation

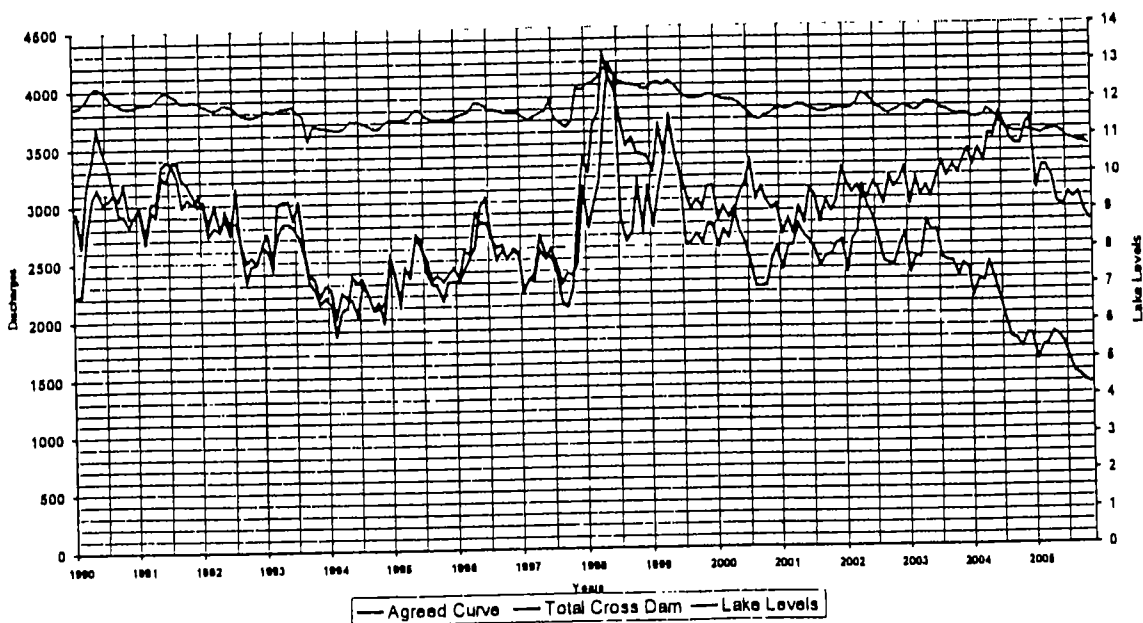


### Effect of Abstraction of Lake Victoria Waters for Power Generation

Year	Initial Lake Level (m)	Change in Lake Level (m)	Net flow taken from lake storage (m <sup>3</sup> /s)	Discharge allowed per Agreed Curve (AC) (m <sup>3</sup> /s)	Actual Total Discharge (m <sup>3</sup> /s)	Net Basin Supply (Q) (m <sup>3</sup> /s)	Excess Discharge (Actual - AC) (m <sup>3</sup> /s)
	1	2	3	4	5	6 (5-3)	7 (5-4)
1999	12.32	-0.17	360	1240	1140	780	-100
2000	12.15	-0.42	890	1000	1110	220	110
2001	11.73	0.03	-60	980	1100	1160	120
2002	11.76	0.06	-130	1010	1180	1310	170
2003	11.82	-0.26	550	970	1200	650	230
2004	11.56	-0.41	865	790	1330	465	540
2005	11.15	-0.51	1075	620	1180	105	560

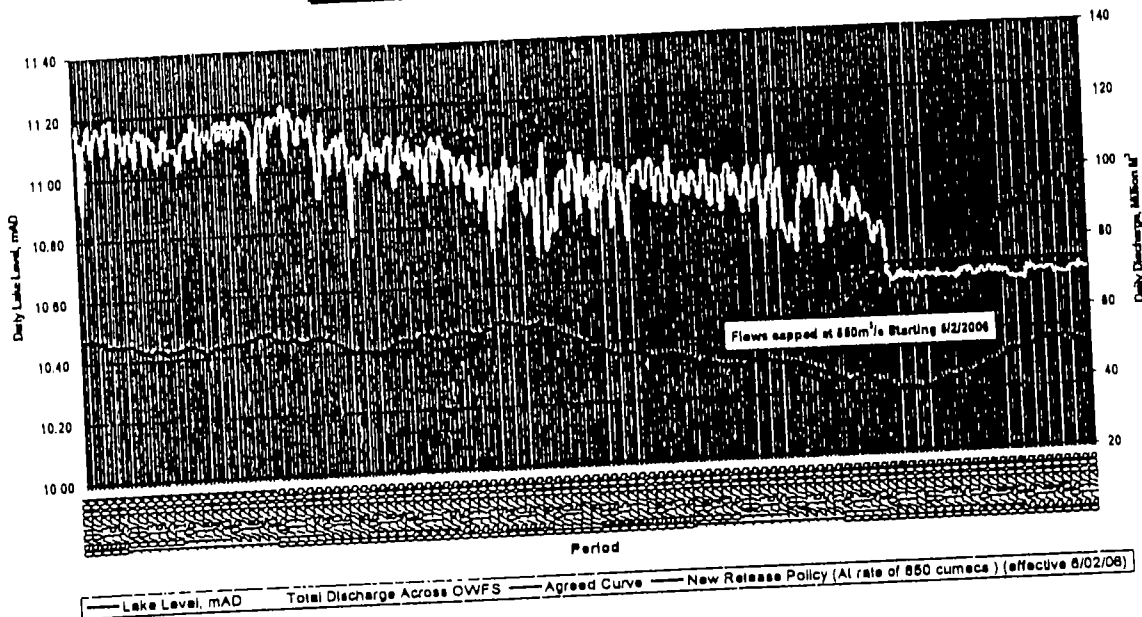
Widening Gap between Actual Lake Discharges and Agreed Curve

Lake Victoria Water Abstraction for Power Generation 1990-2005



Currently Lake Victoria level is declining but discharge is constant ...

**Lake Level Trend September 2004 to June 18<sup>th</sup> 2006**



### Economic and Environmental Impacts of Declining Lake Level

- i) Modifications of major ports and urban water supply infrastructure e.g., piers, and water intakes
- ii) Increased cost of marine transport systems
- iii) Reduced efficiency of hydropower generation due to falling head of the reservoir
- iv) Loss of refugia of endemic fish species, thought to be extinct in the main lake, due to drying littoral zone wetlands
- v) Increasing lake shores area attracts agricultural activities
- vi) Retreating fish landing sites impacts quality, and hence threatens the Nile perch export market, and livelihood
- vii) Resurgence of water hyacinth in near shore shallow waters
- viii) Lake Victoria level declined by 1.68 m between 1999 and 2005, implying loss of fish species habitat

### Proposed Management Responses to Declining Water Levels

The Bank and GEF are committed to support Lake Victoria basin countries initiatives to:

- a) Ensure that Uganda's hydropower generation at Kiira and Nalubaale is based on the 'agreed curve'
- b) Develop other potential hydropower sites; and invest in alternative sources of energy, including thermal, natural gas, and solar
- c) Implement the proposed East African Power Master Plan

- d) Develop and implement a regional water resources management plan during LVEMP 2
- e) Establish a regional institution under the EAC/LVBC, to coordinate the management of the Lake Victoria basin water resources
- f) Develop a framework for M&E and a MIS for the sustainable utilization of the Lake Victoria basin water resources
- g) Build capacity of the regional and national water resources management institutions

### Other Environmental Threats that Need to be Addressed

- a) **Unsustainable fishing practices:** Changes in fish species biodiversity (500+ to three dominant spp); and declining stocks of Nile perch fishery
- b) **Increasing water pollution:** Leading to changes in lake chemical and bio-physical characteristics; eutrophication and its effects; nutrients balance problem; and health problems
- c) **Resurgence of water hyacinth:** As a result of declining water level; re-introduction from Rwanda/Burundi through Kagera river; and failure of the weevils to establish in riverine water hyacinth
- d) **Increased wetlands degradation:** Because of declining water level; and agricultural and urban development
- e) **Watershed degradation:** Due to unsustainable agricultural practices e.g., cultivation on slopes, and deforestation

There's evidence to support the assertion that there's overfishing of Nile perch in Lake Victoria. This evidenced by the fact the catch per unit effort (CPUE) for Nile perch has decreased from 80 kg to 45 kg per boat per day; the number of improved operational fishing gears e.g., motor boats etc., has increased; the propensity for use of 'illegal' gears has increased; the standing stock of Nile perch has decreased from 650,000 tons (1999/2000) to 540,000 tons (2003/04); the current Nile perch yield of 200,000 – 290,000 tons per year exceeds the maximum sustainable yield (MSY) of about 235,000 tons/year and the age/size at maturity of the fish species has declined

### Proposed Management Responses to Over fishing

World Bank and GEF are committed to continue supporting Lake Victoria basin countries to:

- Adopt the Precautionary Principle until such time as information allows more targeted management intervention
- Improve strategies for monitoring and assessment of the status of the fisheries as the basis for better management
- Strengthen regulatory framework and enforcement to ensure better fishing practices
- Reduce post harvest losses and develop mechanisms to add value of the exports

- Identify and implement mechanisms for reducing fishing pressure, including aquaculture, quotas, and closed fishing seasons
- Improve data sharing amongst institutions and stakeholders to improve assessment of the status of the fisheries and management interventions
- Enhance community involvement in the management of the fisheries e.g., beach management units
- Encourage donor collaboration under the Lake Victoria Basin Commission initiatives

### Effects of Pollution of Lake Victoria Ecosystem

- Presence of high level of nutrients in the lake e.g., current TP levels are three times higher than during 1960-61 period
- Increased algal biomass as evidenced by high chlorophyll levels (3-8 times) and primary productivity (2 times)
- Occurrence of frequent *Cyanobacteria spp* blooms
- Increased turbidity resulting from sediment loading and biological activity in-lake, thus reducing transparency
- Depletion of oxygen which is severe (anoxic conditions) and prolonged in pelagic bottom waters
- Reduced silicon levels as demand by Si requiring algae (e.g., diatoms) has exceeded the re-supply from the catchment
- Increased lake eutrophication due to P and N deposition
- Loss of fish habitat due to deteriorating oxygen conditions

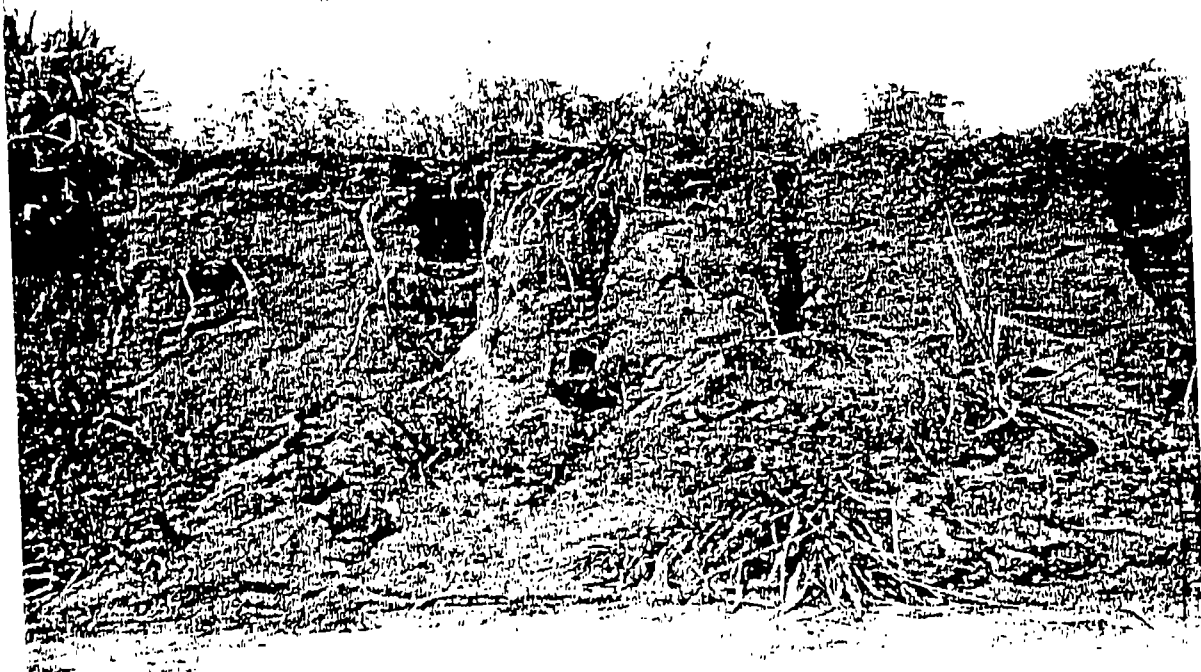


Increasing Inflow of water hyacinth from the Kagera River ...





Increasing encroachment of littoral wetlands for agriculture ...



Increasing watershed degradation due to poor land use practices ...

### Characteristics that threaten the Efficacy of the Lake Victoria Basin Institutions

- East African Community (EAC) has no critical mass for managing transboundary natural resources
- A Protocol on Sustainable Lake Victoria Development ratified in November 2004 needs to be implemented
- Lake Victoria Basin Commission (LVBC) established under the EAC in July 2005 needs to be strengthened
- Lake Victoria Fisheries Organization established under LVEMP needs to be strengthened
- Regional Management Information System (MIS) and information sharing protocols need to be developed
- Capacity of the national natural resources and environmental institutions to regulate resources utilization needs to be built
- Policies, legislations, and regulatory standards for natural resources utilization and environmental management need to be harmonized
- Mechanisms for sustainable financing of Lake Victoria Basin management need to be developed and implemented

### Challenges for Lake Victoria Basin Management

Mainstreaming the integrated Lake Victoria Basin management initiatives in the:

- National and EAC priorities
- National and EAC planning processes
- Integrated water, fisheries, and land resources management plans
- Habitat and biodiversity conservation programs
- National and EAC economic development strategies and programs

**PRESENTATION BY DR. DR. K.W. KIPKORE, DEPUTY  
EXECUTIVE SECRETARY, LVBC**

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**THE WATER LEVELS OF LAKE VICTORIA**

**Presentation by:**

*Dr.K.W.Kipkore*

**Deputy Executive Secretary**

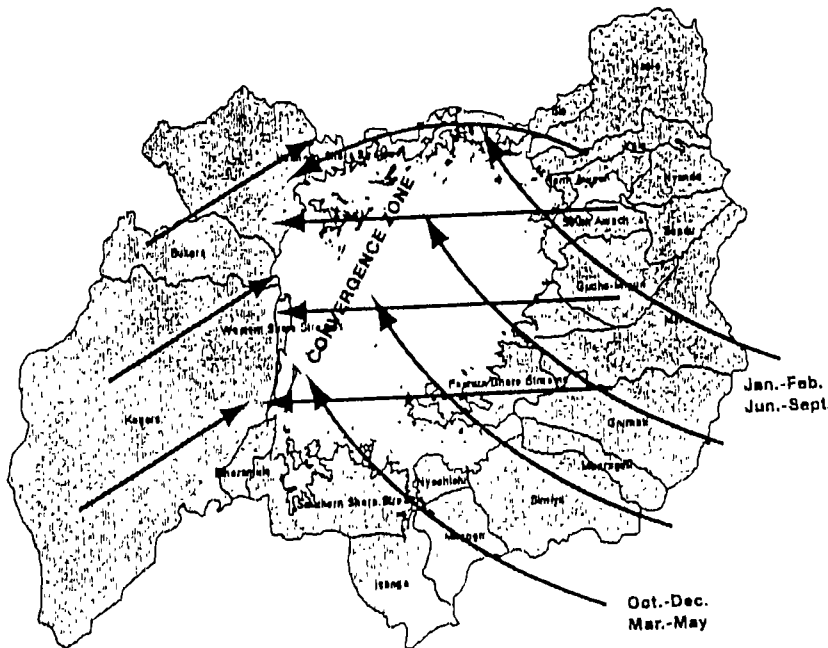
**Lake Victoria Basin Commission**

Background information on Lake Victoria Basin regarding its potential and threats and constraints is available in the LVEMP study 1997 – 2005; Lake Victoria Water Resources Management Study 2004 and the regional Power Master Plan 2005.

**Factors Influencing Water Levels**

The main factors that influence Lake Victoria water levels are Meteorology e.g. wind, rainfall, temperature, evaporation. Other factors include hydrological factors such as river inflow and outflows and wind patterns around the Lake.

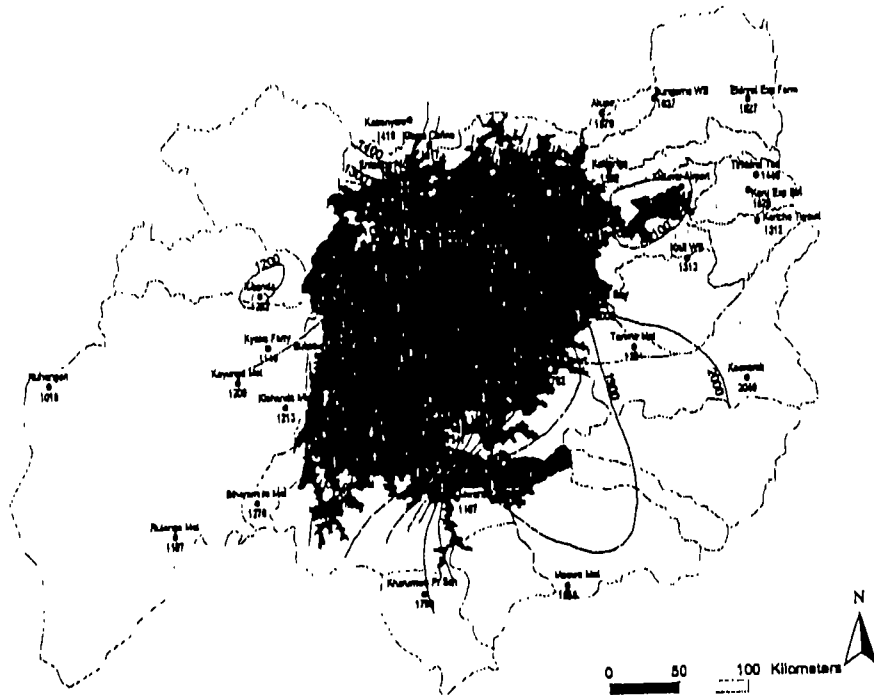
**1. Wind Patterns around the lake**



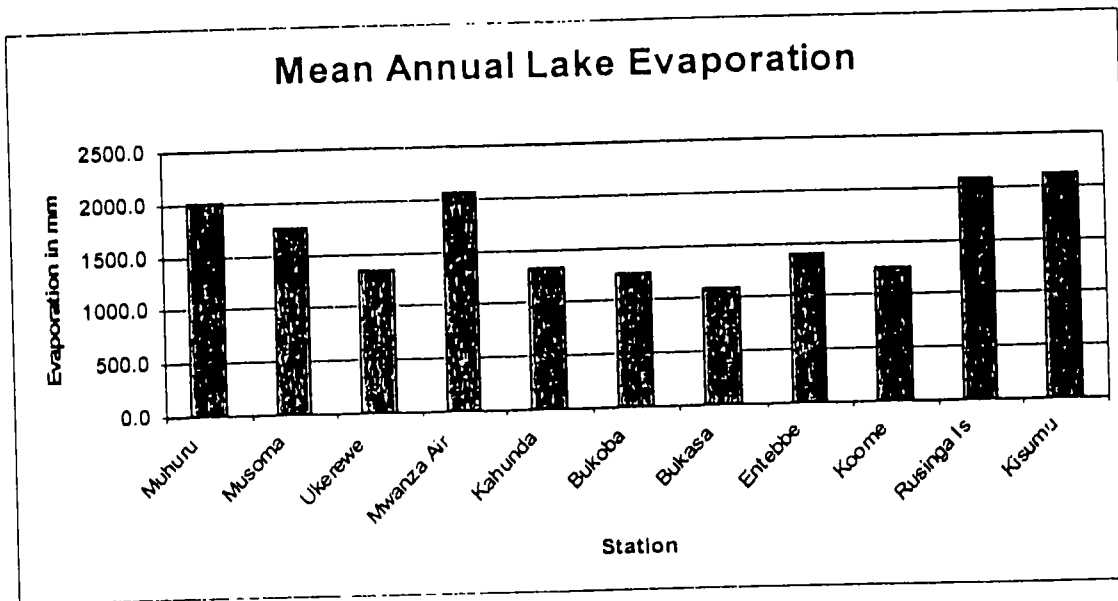


## 2. Evaporation from Lake Victoria

### Mean Annual Evaporation over Lake Victoria

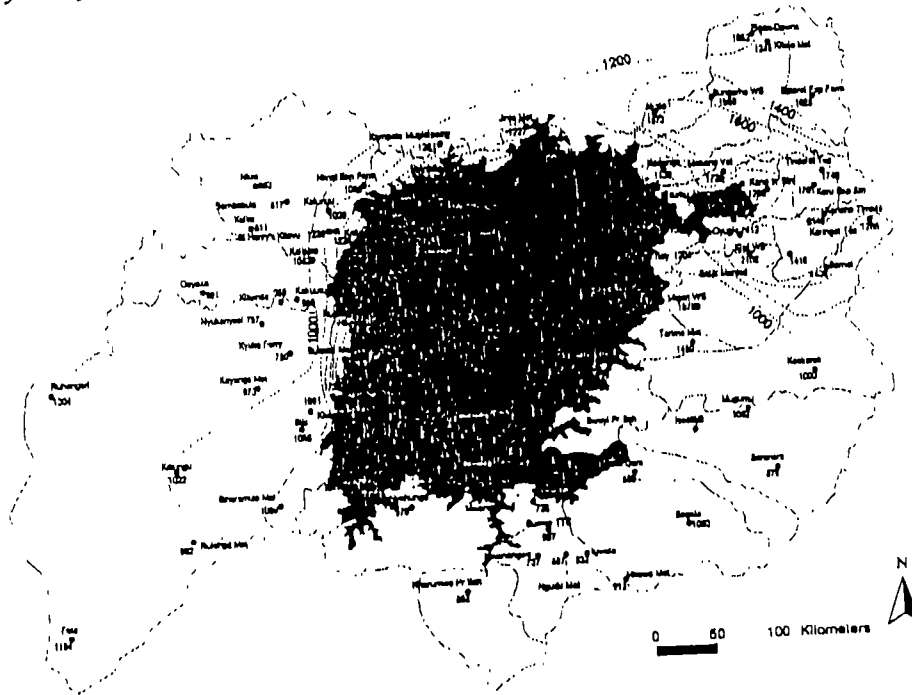


### Evaporation Trends

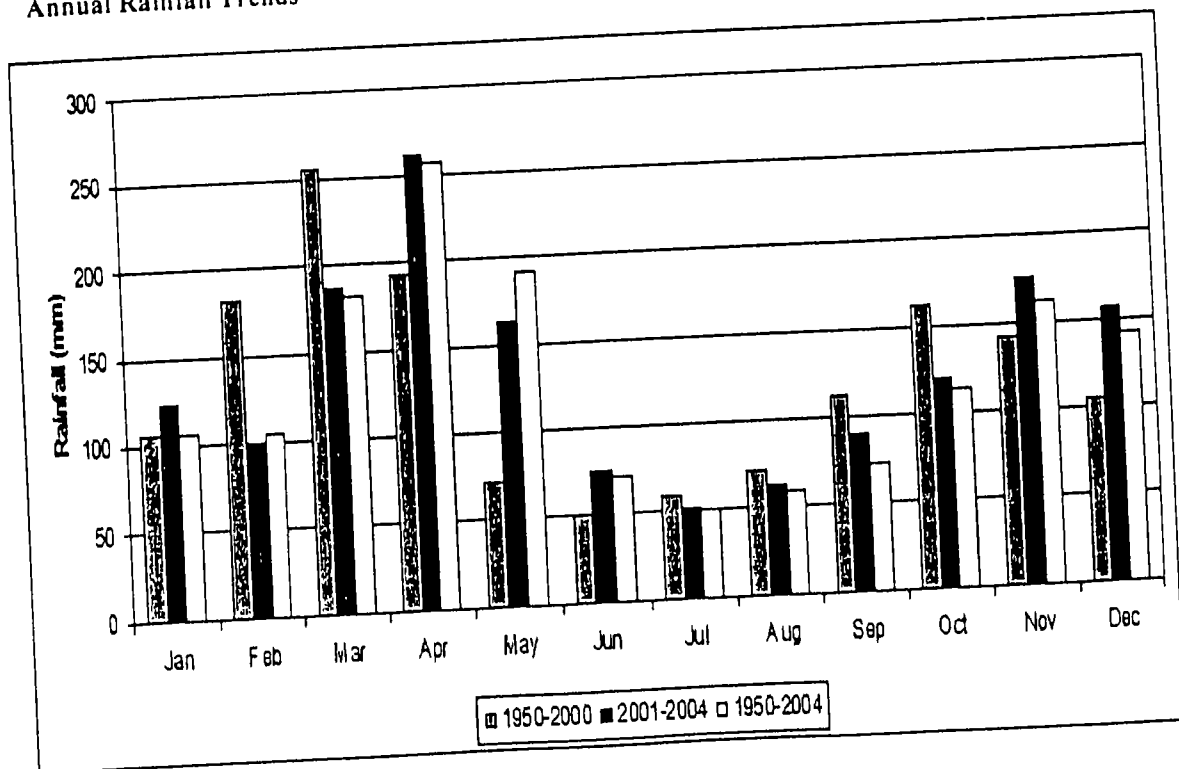


### 3. Rainfall on Lake Victoria

#### *Isohyets of Lake Victoria*



#### Annual Rainfall Trends



#### 4. Inflows - Kenya

Drainage Basin	1950-2000		2001-2004		Long term 1950-2004	
	Flow in Cumecs	%	Flow in Cumecs	%	Flow in Cumecs	%
Sio	11.4	1.4	9.8	1.4	11.3	1.4
<b>Nzola</b>	<b>116.7</b>	<b>14.5</b>	<b>107.4</b>	<b>15.7</b>	<b>116.1</b>	<b>14.6</b>
Yala	37.7	4.7	47.9	7.0	38.4	4.8
Nyando	18.5	2.3	41.9	6.1	20.3	2.6
North Awach	3.8	0.5	3.3	0.5	3.7	0.5
South Awach	5.9	0.7	5.5	0.8	5.9	0.7
Sondu	42.2	5.2	43.9	6.4	42.4	5.3
<b>Gucha-Migori</b>	<b>58.0</b>	<b>7.2</b>	<b>39.9</b>	<b>5.8</b>	<b>56.6</b>	<b>7.1</b>
<b>Total</b>	<b>294.2</b>		<b>299.6</b>		<b>294.7</b>	

#### Inflows – Tanzania

Drainage Basin	1950-2000		2001-2004		Long term 1950-2004	
	Flow in Cumecs	%	Flow in Cumecs	%	Flow in Cumecs	%
Mara	37.5	4.7	23.1	3.4	36.5	4.6
Grumeti	11.5	1.4	4.6	0.7	11.0	1.4
Mbalageti	4.3	0.5	3.5	0.5	4.2	0.5
E. Shore Streams	18.6	2.3	11.3	1.6	18.1	2.3
<b>Simiyu</b>	<b>39.0</b>	<b>4.8</b>	<b>12.2</b>	<b>1.8</b>	<b>37.0</b>	<b>4.6</b>
Magogo-Maome	8.4	1.0	1.6	0.2	7.8	1.0
Nyashishi	1.6	0.2	0.3	0.0	1.5	0.2
Issanga	31.0	3.9	4.3	0.6	29.0	3.6
S. Shore Streams	25.7	3.2	3.5	0.5	24.1	3.0
Biharamulo	17.8	2.2	18.3	2.7	17.9	2.2
W. Shore Streams	20.7	2.6	18.9	2.7	20.6	2.6
<b>Total</b>	<b>216.1</b>		<b>101.6</b>		<b>207.7</b>	

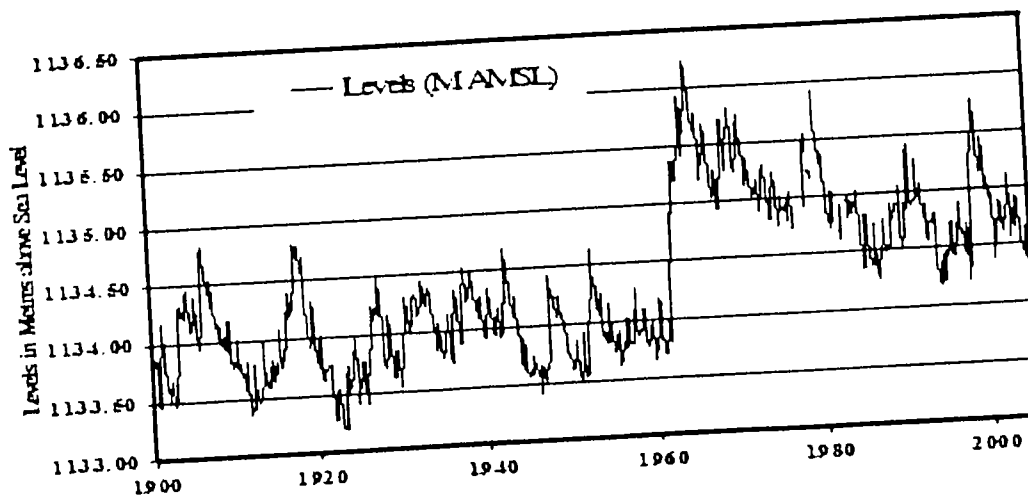
### Inflows – Uganda

Drainage Basin	1950-2000		2001-2004		Long term 1950-2004	
	Flow in Cumecs	%	Flow in Cumecs	%	Flow in Cumecs	%
Kagera	261.1	32.4	252.5	36.8	260.5	32.7
Bukora	3.1	0.4	2.0	0.3	3.0	0.4
Katonga	5.1	0.6	2.1	0.3	4.9	0.6
N. Shore Streams	25.6	3.2	28.2	4.1	25.8	3.2
<b>Total</b>	<b>294.9</b>		<b>284.8</b>		<b>294.2</b>	
<b>G.Total</b>	<b>805.3</b>		<b>686.2</b>		<b>796.6</b>	

### 5. R. Nile outflow – Jinja

	1950-2000		2001-2004		Long term 1950-2004	
	Flow out Cumecs	%	Flow out Cumecs	%	Flow out Cumecs	%
Out Flow	261.1	32.4	252.5	36.8	260.5	32.7

### Water Levels of L. Victoria 1900 – 2000





### Water balance of the lake

Process	1950-2000		2001-2004		1950-2004	
	Flow m <sup>3</sup> /s	%	Flow m <sup>3</sup> /s	%	Flow m <sup>3</sup> /s	%
Inflow						
Rainfall	3611.5	81.8	3644.0	84.2	3613.8	81.9
Basin discharge	805.3	18.2	686.2	15.8	796.6	18.1
Outflow						
Evaporation from lake	3329.8	76.1	3337.5	73.5	3330.3	75.9
Victoria Nile	1046.2	23.9	1,201.9	26.5	1057.6	24.1
Sum	40.77402		-209.24		22.59122	

### Summary Findings: Water Level Decline 2001-

1. The evaporation regime over the lake has not shown any significant change in the period 2001-2004.
2. Rainfall over the lake has reduced by 4.2% from 1704.4 mm to 1610.76 mm annually in the period 2001-2004.
3. Catchments discharges into the lake have reduced by 35.5% from 799.10 m<sup>3</sup>/s to 515.24 m<sup>3</sup>/s between 2002-2004.
4. Outflow into the Nile has increased by 21.3% from 1,096.34 m<sup>3</sup>/s to 1,329.33 m<sup>3</sup>/s in the period 2001-2004.

## Recent trends: Uganda Intervention Jan- Mar 06

Dekad Average Lake Levels (Jan- March 10, 2008)



### Recent Trends: EA Power Master Plan 2005- concerns

- Non participation of the Water Ministries in the study and critical hydrological input may be missing
- Victoria Nile hydropower potential projections have been based on post 1961 hydrological data (ds 1165m<sup>3</sup>/s) cf to 1900-2000 (ds 861 m<sup>3</sup>/s)
- Current water levels are in line the 102 yr av.
- Re-evaluation of the projections may be necessary

### Recommendations

1. Watershed Management measures must be put in place
2. A new adaptive discharge policy should be developed and adopted to guide the discharge of water at Jinja
3. Tanzania and Kenya support direct investment in the hydropower generation in the Victoria Nile

**PRESENTATION BY A.A MASSAWE, MARINE SERVICE COMPANY,  
MWANZA - TANZANIA**

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**EFFECT OF DECLINING WATER LEVELS ON LAKE VICTORIA ON  
MARINE TRANSPORT**

**Presenter: A. A. Massawe**

**Marine Services Company Limited**

**P.O Box 2385 -Mwanza, Tanzania**

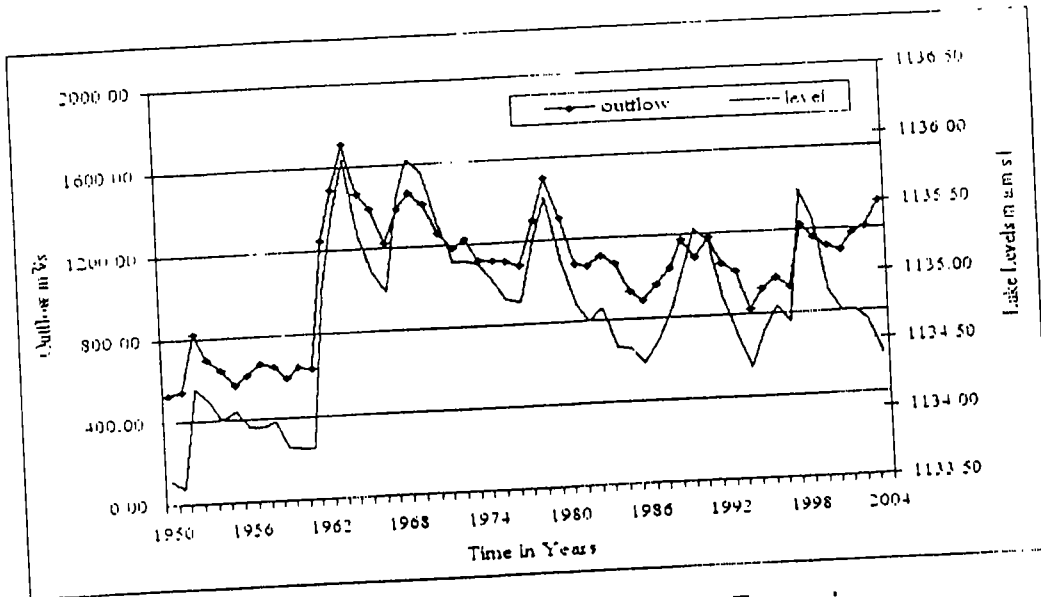
**Date: 30th June, 2006**

Lake Victoria is the largest fresh water lake in Africa. Approximately 30 million people depend on the water resources of this lake. The Lake has gone under considerable stress due to human activities. By Dec 2004 lake waters had gone down by 1.94m. The Lake waters provide a natural means of transport. Its decline has greatly affected marine transport.

Trends of the decrease of water levels on Lake Victoria have shown that meteorologically, Lake Victoria is a bare lake which is sensitive to changes in rainfall and evaporation. Fewer rains and a higher rate of evaporation contributed to its rapid decline in water levels

The water inflow into the lake has decreased considerably whilst the water outflow has increased through the White Nile. The second dam constructed at Jinja, Uganda poses a major threat to the level of the lake waters as can be seen below:

Figure 1: Average rainfall and evaporation on Lake Victoria from 1950 to 2004  
 Lake level and outflow through the White Nile at Jinja

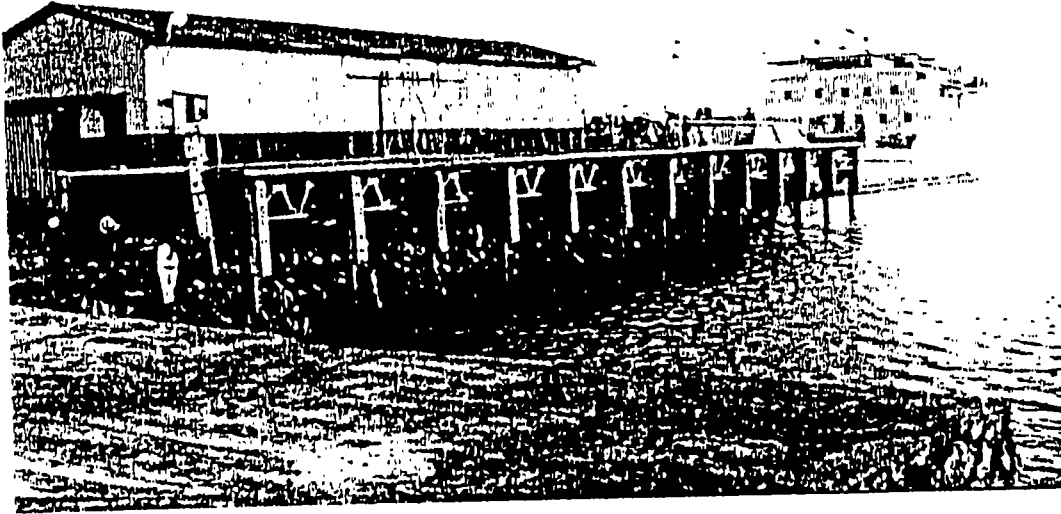


Source: LVEMP-water quality component, Mwanza Tanzania  
 Visual assessment of decline in lake water levels

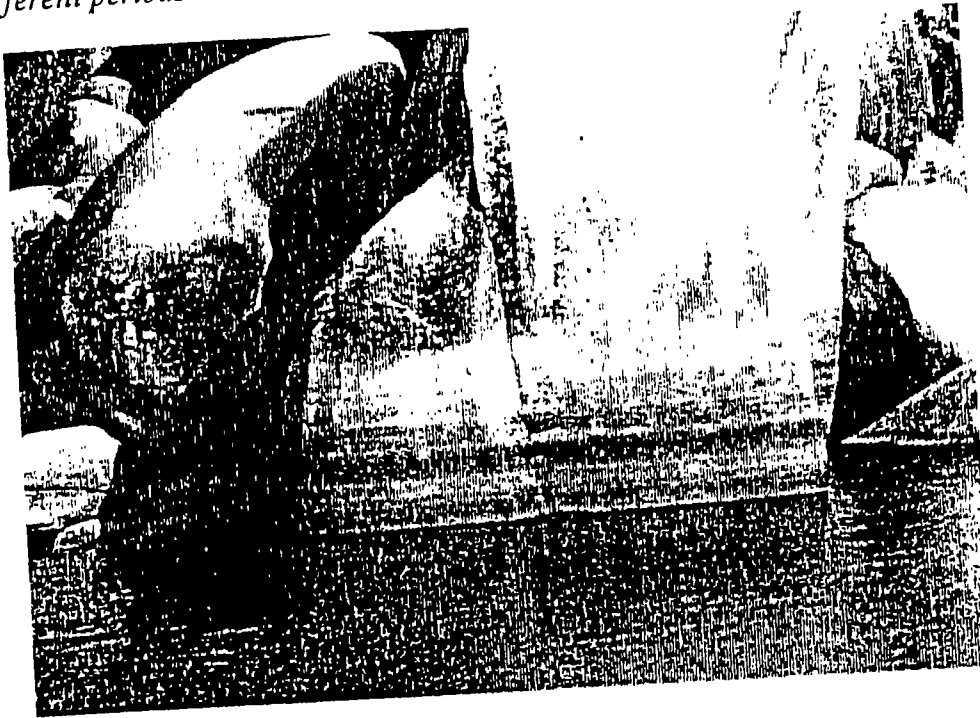
Figure 4: Showing water gauge instrument hanging at Mwanza south port, Tanzania  
 due to decline in lake water levels



*Figure 5: Showing water gauge instrument hanging at Nansio port- Ukerewe Island, Tanzania due to decline in lake water levels*



*Figure 6: Famous Bismark rocks at Mwanza, Tanzania printed with water levels over different periods*



*Figure 7: Former Secretary General of the EAC Hon. Amanyamushenga and the KRC Snr. Marine Superintendent Vitalis Leo assess decline in lake water levels at Kisumu port, Kenya in Feb, 2006*

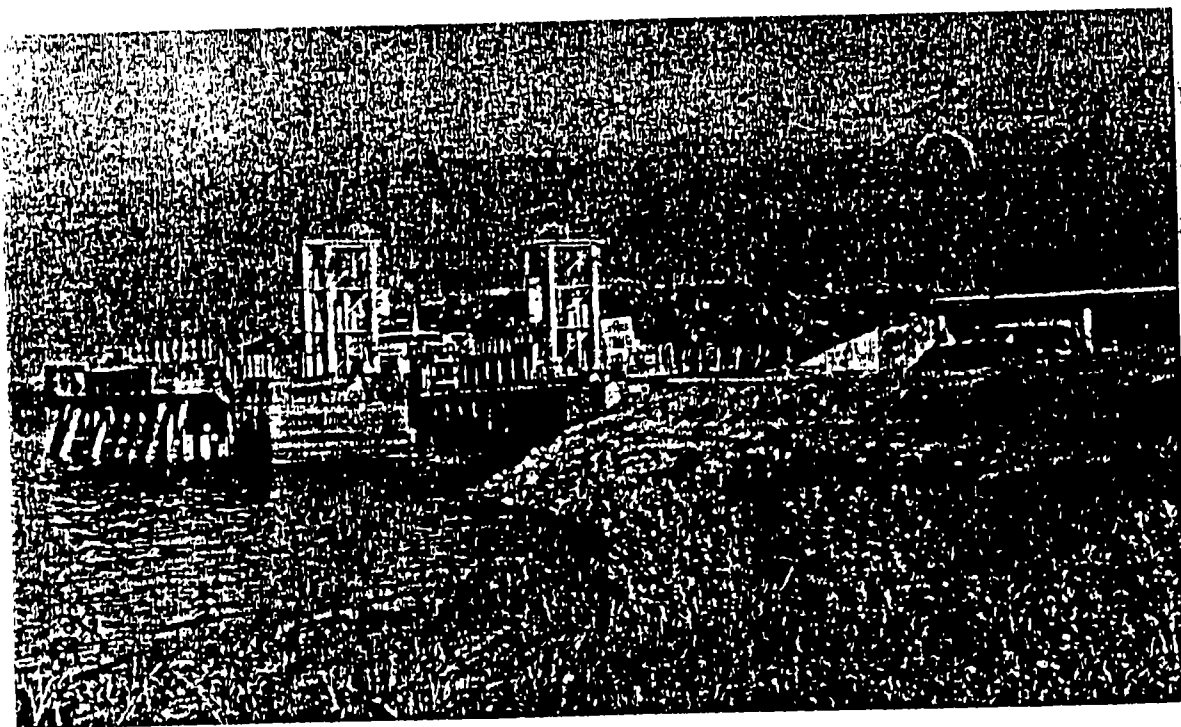


## EFFECT OF DECLINING WATER LEVELS ON MARINE TRANSPORT

### Effects to Lake Ports

The declining water levels have caused the reduction of loading capacities of ships. Ships berth halfway at the quay leaving large portion at deeper waters. Moreover ships approach quay by head to enable passenger's board & disembark at the forepeak. Modifications of gangways and ship's upper deck for safe boarding of passengers have had to be carried out.

*Figure 8: Showing decline in lake water levels at Mwanza south port, Tanzania wagon ferry terminal printed over period*



*Figure 9: Showing decline in lake water levels at Kisumu port, Kenya wagon ferry terminal printed over period*



*Figure 10: Showing portion of Mwanza North port, Tanzania RORO terminal closed due to decline in lake water levels*

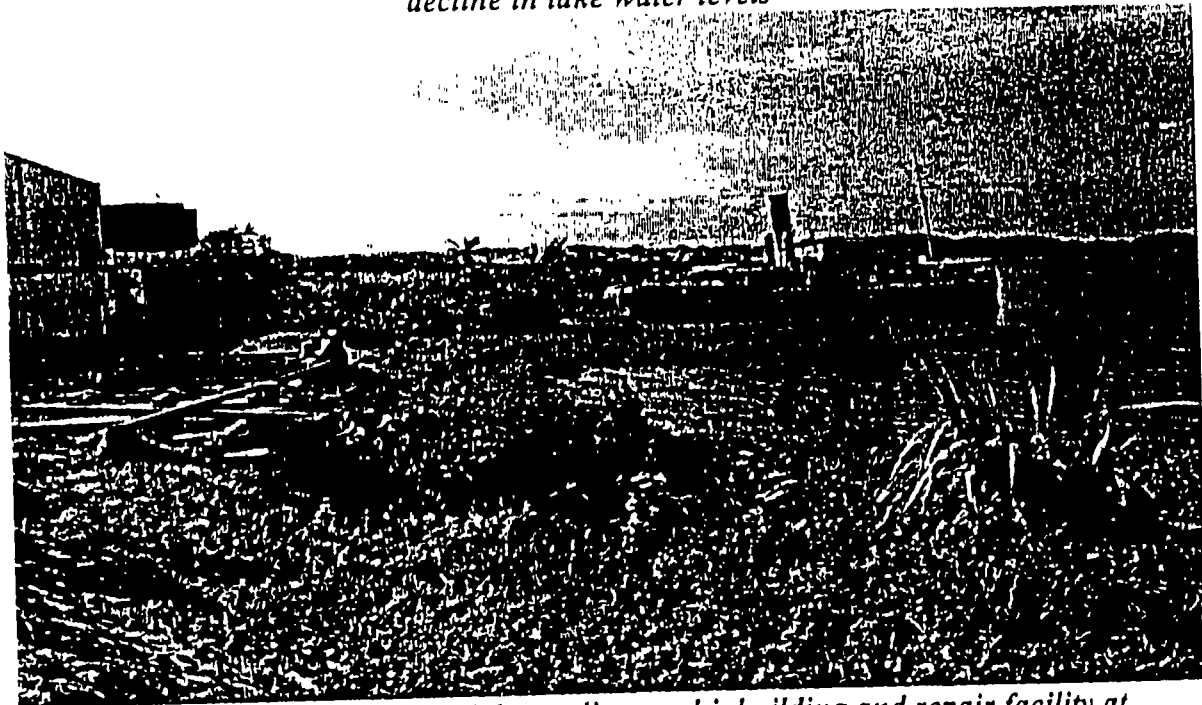


### **EFFECTS TO SHIPBUILDING & REPAIR FACILITIES**

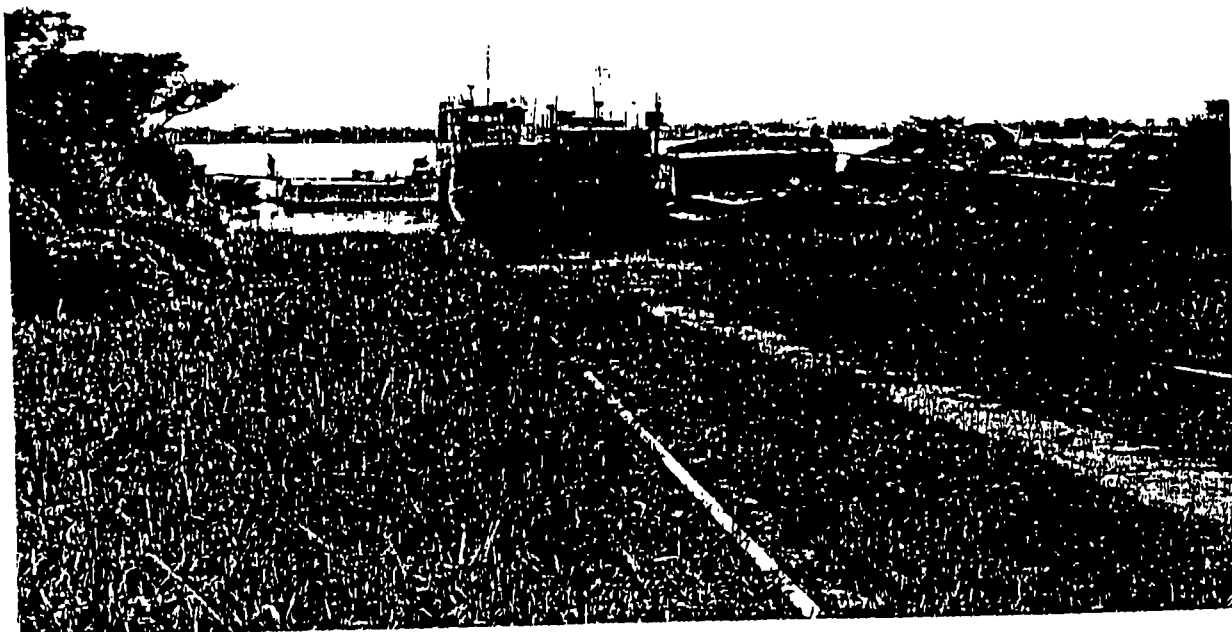
Regarding shipbuilding yards and repair facilities, the decline has led to the closure of the M/s Kamanga Ferry Ltd slipway facilities at Mwanza, Tanzania; closure of M/s Songoro Marine slipway facilities at Mwanza, Tanzania. Two floating docks of M/s Marine Services Co. Ltd at Mwanza, Tanzania have almost grounding at the quay - the only facilities currently operational on Tanzania side. One floating dock of M/s Uganda Railways at Port Bell is almost grounding. One dry dock and two slipways of M/s Kenya Railways at Kisumu have been seriously affected, making it almost impossible to dock big ships.



*Figure 11: Showing closed maintenance quay at Mwanza south port, Tanzania due to decline in lake water levels*



*Figure 12: Showing almost closed down slipway shipbuilding and repair facility at Kisumu port, Kenya due to decline in lake water levels*

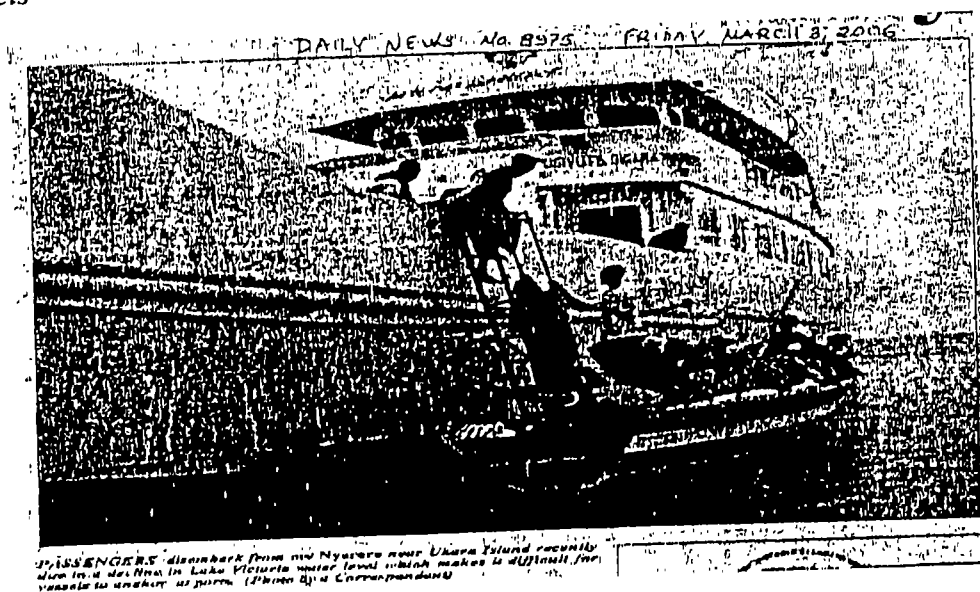


## EFFECT TO SHIPPING BUSINESS

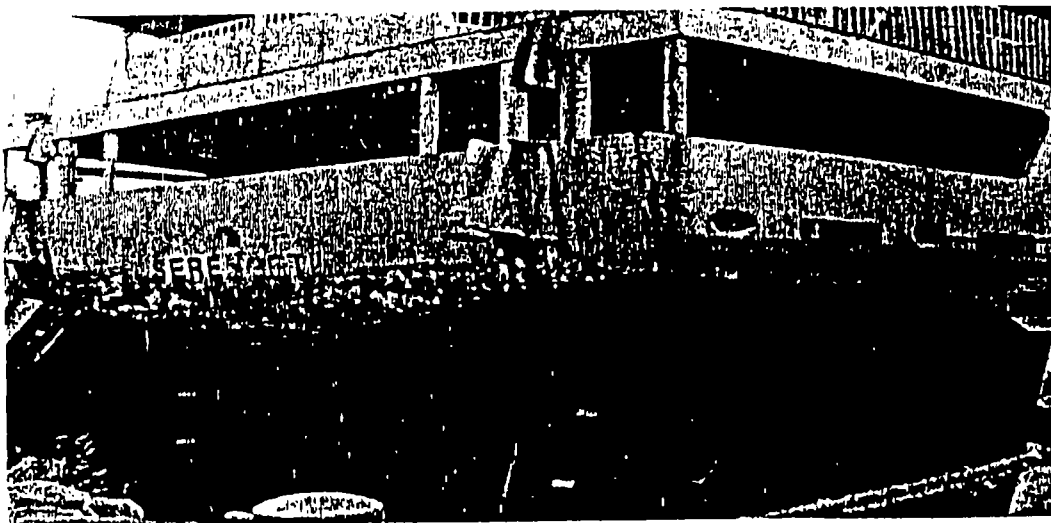
Some of the commercial and technical concerns in this area include

- Ships loaded less cargo to avoid grounding at ports
- Several manoeuvring to deeper waters during loading
- Ships berthing at the quay by head or anchor offshore.
- Continuous Running of ships engines and propulsion systems during berthing
- Higher fuel consumptions
- Higher tear & wear or lost/damage of underwater equipments
- Higher tear & wear of ships hull due to grounding
- Frequent grounding of ships for repair or replacement of consumable parts

*Figure 13: Showing passengers disembarking from a passenger ship Mv. Nyerere into the wooden boat offshore at Ukara Island in Tanzania due to decline in lake water levels*



*Figure 14: Showing passenger ship Mv. Serengeti at Mwanza south port floating dock in Tanzania for replacement of one lost propeller and repair of her one bent steering rudder due to decline in lake water levels*



Example of losses so far incurred by some shipping companies in Tanzania from May 2005 to May 2006

*Marine services Company Limited*

Type of Loss	Quantity	Value (TZ Shs)
Lost cargo	33,980 tons	339,324,000.00
Excess Fuel Use	81,400 Lts	100,680,000.00
Lost propeller of Mv. Victoria:	One	37,500,000.00
Mv. Victoria Thordon bushing material, bronze stern Tube seal and gland parking grease		19,073,250.00
Lost propeller and its accessories of Mv. Serengeti	One	88,705,560.00
Thordon bush for Mv. Serengeti		7,350,750.00
Lost steering rudder of Mv. Umoja	Two	40,125,852.00
Cost of floating docks		10,000,000.00
<b>GRAND TOTAL LOSS</b>		<b>642,759,412.00</b>
		<b>USD:</b>
		<b>514,207.50</b>

1. Mkombozi Fishing & Marine Transport incurred losses due to frequent use of dock totalling *TZ Shillings: 19,613,250 Or USD: 15,690.6*
2. Kamanga Ferry Limited incurred costs due to frequent use of dock totalling *TZ Shillings: 17,321,280.00 Or USD. 13,857.0*
3. M/S Juliana incurred losses due to frequent use of dock to the tune of *TZ Shillings: 8,593,605 Or USD. 6,874.9*

**(ii) Implications to Customers**

Some of the problems that have been encountered by customers include difficulties in boarding and disembarking to/from ships; creation of fear and anxiety and unpopularity of water transport.

### **(iii) Economic Implication**

Some of the impacts are impaired transportation to goods and services which translates to colossal sums.

### **INITIATIVES TAKEN BY SHIPPING COMPANIES**

#### **(i) Marine Services Company Limited (MSCL)**

In its bid to have the problem looked into, the company has prepared a report to respective Ministries and EAC over the issue. In this respect that the former Secretary General of the EAC made working tour to Lake Victoria on rapid assessment of the declining lake water levels from 7th to 11th Feb, 2006. A Delegation of EALA visited the company in May 2006 and was accordingly briefed on the serious decline in lake water levels and its effects in marine transport. The company also coordinated a meeting of Lake Stakeholders of Mwanza District, Tanzania on 14th March 2006.

#### **(ii) Kenya Railways Corporation (KRC)**

The corporation assessed the receding trend of the water levels and its effects in marine operations in Lake Victoria. They forwarded their report to respective Ministries and EAC.

### **RECOMMENDATIONS & CONCLUSIONS**

1. Need to dredge all the ports
2. Joint monitoring and control of lake Victoria water outflow
3. Governments to invest in the development and maintenance of ports

PRESENTATION BY DR. OBIERO ONG'NG'A, EXECUTIVE  
DIRECTOR, OSIENALA

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THE EFFECT OF DECLINING WATER LEVELS ON FISHERIES

*Dr. Obiero Ong'ang'a*

*Executive Director – OSIENALA.*

**Introduction**

Some of the of OSIENALA (Friends of the Lake) include a Speed Boat for rescue missions in Lake Victoria Kenya, Radio Lake Victoria 92.2FM for informing and entertaining fishermen, Boat for Environmental Education, OSIENALA Beach Bank for fishermen along the Lake etc.

**Background**

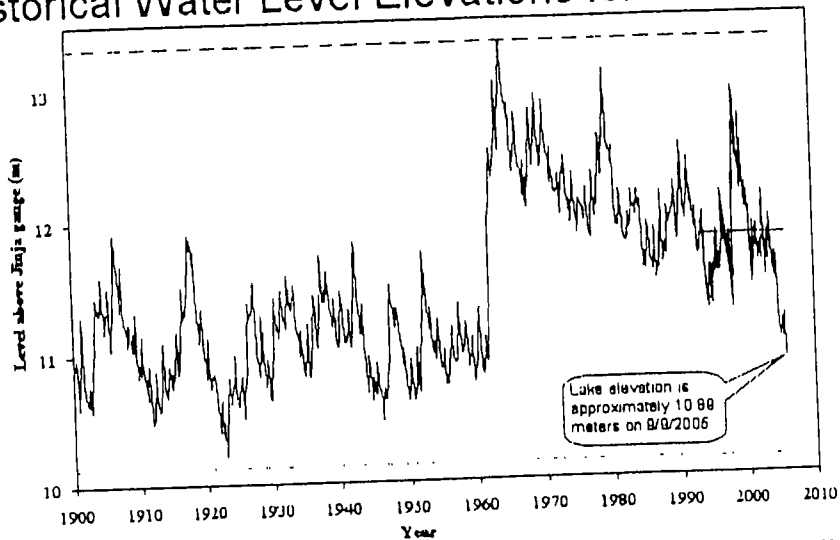
Lake Victoria is the second largest fresh water lake in the World. It is surrounded by three East African States: With 6% in Kenya; Tanzania 52% and Uganda 42% and is Located at 0:210 North and 3:000 South of the Equator. Its total length is 3,440 kms and 240 kms wide from East to West. The Lake is 1,134 meters above sea level with maximum depth of 82m. with a surface area is 68,870 km<sup>2</sup>, catchment area of 180,950 km<sup>2</sup>. It is generally shallow with maximum depth of 84 meters and mean depth of 40 meters.

Historically, the origins and age of the lake is still shrouded in deep mystery. Hickman *et al* (60, p36) suggests that it was formed due to warping and tilting of land. This could be during Miocene, Pliocene and Part of Pleistocene eras (2million years ago). During warping some river valleys were raised to flood what is presently seen as L. Victoria. More recent up thrust of the western side of the basin reversed the rivers to flow eastwards and led to further emergence of River Nile. Some Scientists suggest the possibility of the lake drying up about 10,000 and 14,000 years ago.

**Water levels/balance**

Changes in the water balance of a lake have great influences on the water quality, quantity as well as the biotic environment. It can result in serious economic and health consequences An increase in the water level through precipitation would have a positive effect on hydroelectricity energy production while it can cause problems on onshore facilities

## Historical Water Level Elevations for Lake Victoria



### Data Source

Historical water level gauge data from Jinja, Uganda (near Lake Victoria's outlet)  
 Satellite radar altimeter data from USGS/NASA/UMD at  
[http://www.pecad.fas.usda.gov/cropexplorer/global\\_reservoir/](http://www.pecad.fas.usda.gov/cropexplorer/global_reservoir/)



U.S. Department of Agriculture (USDA)  
 Foreign Agricultural Service (FAS)  
 Production Estimates & Crop  
 Assessment Division (PECAD)

## The Effect of Water Balance to Fish Stocks

Changes in water budget are respectively accompanied by water level fluctuation and promote thermal structures which result in nutrient and food web dynamics. Studies have proved that there is a positive correlation between water level and fish landings (Williams, 1972). The abundant fish catches are highly correlated with rainfall and lake levels. The records show that the catches reduced from 60% and 70% during the current reduction of water level in Nyanza Gulf.

Changes in temperature affect the spatial and temporal distribution of fish and other aquatic organisms due to intrinsic effects on the physical and chemical environment. While high level of water budget helps to submerge parts of the wetlands and play an important role as nursery grounds of cichlid fishes, low level destroy nurseries.

### Effect to Fisheries

Exposure of tilapia and other riverine species breeding grounds to contamination reduces breeding area and affects reproduction. Reduced water depth means little energy is required to mix the water column. In the case of shallow water, the entire column is mixed resulting in frequent suspension of sediment. This clogs the gills of fish thus suffocating them. The result is that fish are driven away from such areas into habitats where water quality is better. This was witnessed in the Nyanza Gulf during the recent long drought when the catches of Nile perch and tilapia was as low as 60%.

## Recommendations

1. Changes in water levels are due to climatic changes and human activities in the catchment. The stability can be maintained by good practices such as:
  - Control of deforestations
  - Reduction of excessive use of river water for irrigation and damming for electricity generation.
2. Lake Victoria water levels are extremely sensitive to moderate changes in rainfall. There is urgent need for better management of the rain catchment areas in the basin.
3. Since a number of endemic cichlid flock (e.g., Haplochromines) have disappeared or are threatened with extinction; it is recommended that some gene bank should be kept in small water bodies close to the lake for future restocking.
4. Reduce overloading of our rivers as the only source for hydro-power generation. We could utilize the Ocean Thermal Energy Conversion Technique (OTEC). The study should be conducted at Mbita causeway for possible building of flying bridge and construction power generating turbines for power
  - Application of satellite in monitoring of Lake Victoria water level.
  - The most authentic technique is the use of satellite ultimately named GRACE (Gravity Recovery and Climate Experiment).
5. Monitoring of water level is done only at Jinja in Uganda. There should be a monitoring system developed for Kenya, Uganda and Tanzania. We should not only rely on Foreign Agricultural Service (FAS), a Global Reservoir Monitor, to inform us about the level of our lake.
6. Communities can also be involved in measuring river water levels and even lakes. River water gauges can be manned by trained community volunteers.
7. We should also be alert enough to worry about the stability of the rocks at bottom of the lake. The lake's seismic data should be generated to assist us predict its future stability. Although it has not been proved, the stability at the bottom can also lower the water level has it happened in Lake Tanganyika.
8. EIA should be done to all major projects to be implemented in the Lake Victoria basin. The EIA should be discussed and accepted by all East African Countries before implementation begins.

**PRESENTATION BY ANDREW SEKAYIZI, AREA MANAGER,  
NWSC-JINJA**

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**THE IMPACT OF DROPPING LAKE VICTORIA WATER LEVEL ON WATER  
SUPPLY**

**SERVICE PROVISION BY NATIONAL WATER AND SEWERAGE  
CORPORATION**

**Prepared By: Andrew Sekayizi**

**AREA MANAGER NWSC-JINJA**

**INTRODUCTION**

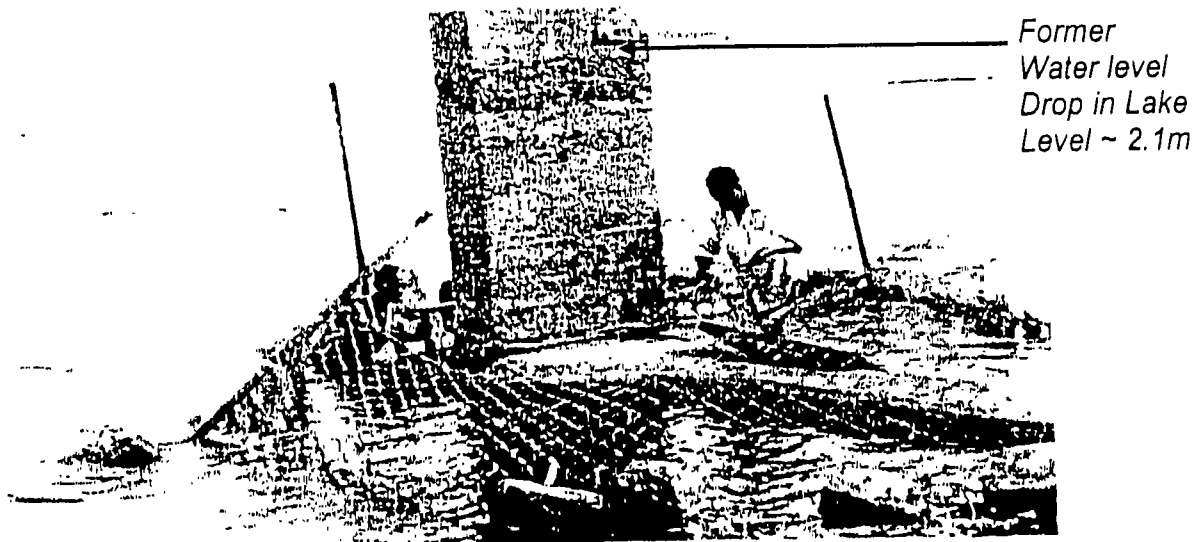
The National Water and Sewerage Corporation of Uganda under the 1995 statute, is mandated to provide water and sewerage services to major urban centres in Uganda. Lake Victoria which is the world's second largest fresh water lake is the source of piped water supply for the towns of Jinja/Njeru, Kampala and Entebbe. Furthermore, the satellite towns of Mukono, Kajjansi and Nansana are supplied through the Kampala network. Plans are underway to extend piped water services from Jinja to Iganga.

An estimated population of over two million people currently benefit from piped water services with sources from L. Victoria. Approx 150 ML/d of water is abstracted daily from the NWSC Water Treatment Plants located along the shores of the Lake Victoria. Abstraction Projected to increase by over 100ML/d following the commissioning of the new treatment works for Kampala and New Entebbe in the next 12. Targeting - service coverage beyond the current 70% and to ensure reliable 24 hour supply.

**PROBLEM DEFINITION**

Overtime, NWSC has observed continuous drop in the water level and receding of Lake Victoria which is our abstraction source for raw water for the above towns. (2.1m). By Dec 2005, Intake pipes for Kampala had only 0.5m cover. While in Jinja and Entebbe Areas, the water cover above the intake pipes had dropped from 2.1m to 0.0m leaving the intake pipes partially exposed





The drop in the lake level has come with deterioration of the raw water quality and hence causing water treatment problems. If this trend continues, there is real threat and danger that the raw water intake pipes will be left hanging to the extent that water supply to these towns will be seriously affected.

### **THE TECHNICAL IMPACT OF THE DROP OF LAKE VICTORIA LEVELS**

Some of the technical hitches experienced due to the falling water levels include the abstraction of muddy water which clogs the strainers and filters thus causing significant pumping interruptions; longer treatment time due to silted water which complicates the treatment process resulting in daily water supply interruptions. This has reduced water supply to 20% of the monthly production. The reduced water production has also negatively affected water supply to peri-urban areas of Kampala and Entebbe which had previously received stable water services. Increased frequency of cleaning intake and other treatment structures due to deteriorated raw water quality especially in Jinja, frequency of raw water sump has increased from once a month to twice a week, has also been observed

### **FINANCIAL/ECONOMIC IMPACT**

In this regard, there has been increased production costs due to long treatment processes, high chemical consumption, pumping costs and labour cost for cleaning the treatment facilities (Jinja, 8% Energy increase from 0.86 to 0.93Kwhrs/m<sup>3</sup>- (UG Shs 3Million). Chemical costs increase from 9 to 11gm Alum/m<sup>3</sup> treated water-22%. Labour costs (Cleaning of sump) from Ugshs300, 000 to 1, 600, 000 per month. Also, the intermittent water supply in northern, eastern and south western parts of Kampala, and Entebbe has negatively impacted on socio-economic activities within these areas.

As a result, there is urgent need to construct new water intakes and offshore pipelines for Jinja, Kampala and Entebbe which is estimated to cost US\$4.0million broken down as follows:

- Gaba-Kampala UsD 2.6M
- Masese- Jinja UsD 0.8M
- Entebbe USD 0.6M

There is also need for budget provision to finance the above investments in order to alleviate the eminent problem of water supply in the three towns..

## CONCLUSION

- a. The drop of Lake Victoria levels is a major threat to water supply to towns within the Lake Victoria basin. The continuous drop in the Lake levels, if not controlled could result in water intakes hanging and hence cause serious water supply interruptions within a period of two months
- b. The above problems highlighted constrain NWSC efforts to expand the water supply coverage to the greater Kampala, Entebbe and Jinja.
- c. Since the ongoing donor financed water supply expansion projects in Kampala and Entebbe had no budget provision to mitigate the above problem, Government of Uganda should provide the required financial resources

## COMMUNICATION FROM THE DELEGATION OF MEMBERS OF PARLIAMENT OF UGANDA

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In appreciating the invitation extended to them, the Parliamentarians from Uganda thanked the East African Legislative Assembly for organizing an educative seminar regarding the receding waters of Lake Victoria. They thanked the Government of Uganda for having appointed a Minister in charge of East African Affairs who is senior and experienced citizen in the person of Hon Eriya Kategaya.

They appreciated the high level of content and context of the presentations made by the various organizations and individuals. In line with the serious concern raised over the falling water levels, the delegates vowed to mobilize their communities to help reduce the negative impact on the lake and its basin by this trend.

The Members noted the perceived impact of the Kiira dam at Jinja on the water levels in Lake Victoria. They urged the First Deputy Prime Minister in his capacity as Minister for East African Affairs to take note of the issues raised and expedite action. The Tanzanian Parliament will support the Minister in any bid towards the ratification of the protocols and appropriate bills presented to their Parliament.

The delegation undertook to present a report to Parliament about the seminar as this was within their mandate. They pledged to use the outcomes of the seminar as an instrument for advocacy and support to the Ministry of East African Affairs.

In expressing their support, the delegation promised to bear on their Parliament to improve its oversight role in LVEMP II meant for sustainable development of the basin. They expressed hope that LVEMP II will be for maintaining the catchment area of Lake Victoria, tree planting, dredging of the shores and protect endangered species. They urged the Council of Ministers to bring Rwanda and Burundi on board so that the lake and its basin are comprehensively and wholesomely protected.

Arising out of the concerns expressed by the presenters over the inability of Uganda's Owen Falls Dam management to abide by the Agreed Curve, the delegation from Uganda which comprised of Hon. Kasule Lumumba, Hon. John Odit and Hon. Deus Bikwasizehi informed participants that the Government of Uganda has already taken steps to address the problem of declining water levels as follows:

- Dams are to be constructed down stream. Already Ugshs.99 billion (ninety nine billion Uganda shillings) has been earmarked in this financial year 2006/2007 for the construction of dams/power stations at Bujjagali, Karuma and Nyagak.
- Small dams are to be constructed in rural areas for rural electrification.

- Thermal power generation of 50mw has been procured to reduce the pressure on hydropower by September, 2006.
- Taxes on solar power equipments have been waived with effect from this financial year as alternative source of energy.
- Government of Uganda is to import one million energy saving bulbs in this financial year.
- United States dollars four (4) million as been earmarked on improving on intakes in Jinja, Entebbe and Kampala sites by National Water and Sewerage Corporation.

The delegation urged sister Parliaments of the Partner States and their respective Governments to equally play their constructive roles in addressing the issues that affect Lake Victoria and its basin, especially with regard to environmental degradation concerns as raised by the presenters.

The Ugandan Parliamentarians were of the view that the reports on findings from this workshop will be used to attract a similar workshop for the country Parliaments. They promised to prevail upon the Parliament of Uganda to organize similar forums for all the Members so that the Members are fully aware of this imminent disaster. They urged the resource persons to participate and sensitize the Members when invited to do so in the near future.

## COMMUNICATION FROM THE DELEGATION OF MEMBERS OF PARLIAMENT OF TANZANIA

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The Members of Parliament from Tanzania expressed great concern over the problems posed by receding water levels of Lake Victoria. Lake Victoria, of which 49% is in Tanzania is a vital resource for not only the communities and people living in the vicinity of the Lake, but also contributes the overall growth of national economy through marine transportation, small scale irrigation, fishery and industrial use to mention but a few.

Tanzania is abundantly rich in fishery resources. The Marine water covers 64,300sq kms and fresh water covers 58,000sq kms. This vast and abundant marine water and fresh water resources contributes to the livelihood of the people of Tanzania in the following ways.

### 1.1 Employment:

About 61,828 people are involved in artisinal fishing out of whom 46,670 operate in fresh water including Lake Victoria while 15,183 operate in Marine Water. Communities around Lake Victoria in Mwanza, Mara and Kagera regions as well as engaging agriculture and other activities depend on fishing for their daily subsistence. It is evident, therefore, that the receding water levels in Lake Victoria poses a severe set back to the development of the sub sector and the economy in general in respect of unemployment.

### 1.2 Water supply for Industrial and Domestic Use:

Lake Victoria is the only reliable source of water for people in Mwanza, Kagera and Mara regions. The urban water authorities in these regions are dependent on water from Lake Victoria. Besides, industries located in these places use water from the lake. In view of this, the receding and eventual drying of the lake will deprive these industries of one of the basic industrial inputs water. This will have negative socio economic consequences to the country as a whole.

### 1.3 Foreign Exchange Earnings:

The fishing industries in Mwanza and Musoma earn as foreign currency through the export of fish fillet to the European Union Countries. This helps us to improve on our balance of payment and forex reserve. The residing water level in the lake threatens the future existence of fishing industries.

### 1.4 Nutrition

The fishery industry in Tanzania contributes 30% of food consumption in the country and it is the main source of protein for most people.

### 1.5 Marine Transportation

According to the experts, the decline in water levels has seriously affected the shipping industry, from maritime transport to ship building and repairs. For example, there has been a reduction in the loading capacity. All these have impacted negatively on the future of the shipping industry. The effects of receding water levels in Lake Victoria are pervasive and touch on other sectors not highlighted above such as Tourism, Agriculture, and Health.

## 2.0 CONCLUSION

The problem of receding water level at Lake Victoria is now there with us. As a common saying goes "Knowing the problem is half its cure". The seminar provided the tools with which to diagnose the problem in terms of its magnitude, severity and repercussions if left unattended. Consequently all concerned need to team up and take concrete actions towards solving it

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## CLOSING REMARKS

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HON. ERIYA KATEGAYA first deputy prime minister and minister for east african community affairs, uganda

During his closing remarks, the Minister, noted that the Seminar on the declining water levels of Lake Victoria; its causes, effects, and possible remedies was, indeed, pertinent and timely. This was mainly because the declining water levels of Lake Victoria, and other lakes in the region, have had dire and adverse effects in terms of reduced Hydro-power generation, resulting in power shortages; decline in Fisheries production, problems in Marine/Lake Transport, and shortages in water supply, to mention some of the critical areas. He thanked all the presenters for clearly articulating the issues for easy understanding. The seminar was particularly significant in that it was his first official EAC function since he was appointed into his present portfolio.

Hon Kategaya extended his gratitude to the Speaker of EALA, and the Members of the Assembly, for the initiative of "taking the Assembly to the people" through undertaking outreach programmes such as this particular tour of Kenya that began on June 25, 2006. He felt that this was clearly in line with the region's key objective of ensuring that the East African Community is people-centred and people-driven as a foundation for closer East African integration and ultimately Political Federation.

The Prime Minister was of the view that the outcome of the Seminar would be widely disseminated to all the stakeholders and policy-makers. He reminded the participants that, the EAC Heads of State, at their Summit in Arusha on April 05, 2006, while reviewing the current economic and social situation in the region, noted with concern the drought that had ravaged large parts of the region had contributed to the falling water levels in Lake Victoria, and the related power shortages. The Summit directed that a Special Session of the Council of Ministers be held urgently to address these and related issues.

He took the opportunity to share with the members his perspective on the subject informed by the technical presentations. The main cause of the declining water levels of Lake Victoria, and other lakes in the region, is environmental degradation which has caused extended droughts and fluctuating rain patterns in our region. This factor alone, contributes over 65% to the problem of declining water levels of Lake Victoria.

The main measures to address this environmental degradation include better and sustainable environment and natural resources management practices.

In this regard, the EAC Partner States signed and ratified a Protocol on the Sustainable Development of Lake Victoria Basin which is being implemented. In addition, an EAC Protocol on Environment and Natural Resources Management was signed on April 03, 2006 in Arusha. He urged all the Partner States to expeditiously ratify this Protocol so

that it comes into force and ensure that they implement all the provisions of the Protocol especially the ones relating to:

- i) management of trans-boundary resources;
- ii) conservation of biological biodiversity;
- iii) management of forests, trees, wetlands, and water resources;
- iv) combating desertification; and
- v) Soil and land use management.

He noted that the countries should also devise ways of reducing dependence on wood fuel by embarking on rural electrification projects and diversifying alternative sources of energy, such as hydro-electricity, geothermal, wind, solar, thermal and natural gas.

The Seminar has put in sharp focus the need for the Partner States to urgently implement, with the necessary modifications, the East African Power Master Plan by jointly financing power projects so that we can get an East African Power Pool. This is critical because without reliable and cheaper power, our competitiveness as a region may not improve at the pace we envisage.

The other causes for the declining water levels of Lake Victoria include the excessive water releases at Kiira and Nalubaale hydro-power dams in Uganda accounting for 24% out of the remaining 35%, given the declining water inflows into the Lake as a result of the drought.

In order to alleviate the situation, Uganda reduced water releases from the two dams by 30% with effect from February 2006. This led to a severe power shortage in Uganda but it is a necessary measure which would be reviewed periodically until the outflow levels match the desirable water levels. The water levels have now steadily increased partly due to the rainy season in the Lake's catchment areas.

He thanked <sup>Participants</sup> ~~them~~ for their attention and officially closed the Seminar.





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