Document of
The World Bank

Report No: 36559

IMPLEMENTATION COMPLETION REPORT
(IDA-29090 TF-28664 IDA-29091 TF-28318)

ON TWO

INTERNATIONAL DEVELOPMENT ASSOCIATION (IDA) CREDITS

AND A

GLOBAL ENVIRONMENT FACILITY (GEF) GRANT

IN THE AMOUNT OF US$ 29.74 MILLION

TO THE

GOVERNMENT OF UGANDA

FOR THE

LAKE VICTORIA ENVIRONMENTAL MANAGEMENT PROJECT
(LVEMP)

June 27, 2006

CURRENCY EQUIVALENTS

(Exchange Rate Effective)

Currency Unit = Uganda Shillings

FISCAL YEAR
July 1 June 30

ABBREVIATIONS AND ACRONYMS

AM	Aide Memoire
BOD	Biological Oxygen Demand
BMU	Beach Management Unit
CAPs	Community Action Plans
CAS	Country Assistance Strategy
CBOs	Community Based Organizations
CIGs	Community Interest Groups
CP	Cleaner Production
CPUE	Catch per Unit Effort
DANIDA	Danish International Development Agency
DFID	Department for International Development, United Kingdom
DDT	Dichlorodiphenyltrichloroethane
EAC	East African Community
ECOVIC	EAC Organization for Management of Lake Victoria
ELCOM	Estuary and Lake Computer Model
ERR	Economic Rate of Return
EU	European Union
FAO	United Nations Food and Agriculture Organization
FLT	Fish Levy Trust
FOB	Free on Board
GDP	Gross Domestic Product
GEF	Global Environment Facility
GoK	Government of Kenya
GoT	Government of Tanzania
GoU	Government of Uganda
ICR	Implementation Completion Report
IDA	International Development Association
IEG	Independent Evaluation Group of the World Bank
IFMP	Integrated Fisheries Management Plan
ILMP	Integrated Lake Management Project
KARI	Kawanda Agricultural Research Institute
LVBC	Lake Victoria Basin Commission
LVDP	Lake Victoria Development Program

LVEMP	Lake Victoria Environmental Project
LVFO	Lake Victoria Fisheries Organization
LVFRP	Lake Victoria Fisheries Research Project
M&E	Monitoring and Evaluation
MSY	Maximum Sustainable Yield
MTR	Mid-Term Review
NAADS	National Agricultural Advisory Services
NEMA	National Environmental Management Agency
NGO	Non Governmental Organization
OD/OP	Operational Directive/Policy
PEAP	Poverty Eradication Action Plan
PIC	Project Implementation Committee
PMU/PIU	Project Management/Implementation Unit
QAG	Quality Assurance Group
RPSC	Regional Policy Steering Committee
SAR	Staff Appraisal Report
SIDA	Swedish International Development Agency
SLM	Sustainable Land Management
TDA	Transboundary Diagnostic Analysis
USD	United States Dollar
WWTP	Wastewater Treatment Plan

Vice President:	Gobind T. Nankani
Country Director	Judy O'Connor
Sector Manager	Karen Brooks
Task Team Leader/Task Manager:	Ladisy Chengula

UGANDA
UG: Lake Victoria Env. Proj. (IDA)

CONTENTS

Project ID: P046836	*Project Name:* UG: Lake Victoria Env. Proj. (IDA)
Global Supplemental ID: P046870 *(Fully Blended)*	*Supp. Name:* LAKE VICTORIA ENV. PROJ. (GEF)
Team Leader: Ladisy Komba Chengula	*TL Unit:* AFTS2
ICR Type: Core ICR	*Report Date: June 28, 2006*

1. Project Data

Name: UG: Lake Victoria Env. Proj. (IDA) *L/C/TF Number:* IDA-29090; TF-28664; IDA-29091

Country/Department: UGANDA *Region:* Africa Regional Office

Sector/subsector: Agricultural extension and research (44%); General water, sanitation and flood protection sector (22%); Central government administration (16%); General agriculture, fishing and forestry sector (14%); Animal production (4%)

Theme: Biodiversity (P); Environmental policies and institutions (P); Water resource management (P); Pollution management and environmental health (P)

KEY DATES		*Original*	*Revised/Actual*
PCD:	12/28/1992	*Effective:* 03/05/1997	03/05/1997
Appraisal:	06/18/1996	*MTR:* 03/01/1999	03/01/1999
Approval:	07/30/1996	*Closing:* 12/31/2002	12/31/2005

Supplemental Name: LAKE VICTORIA ENV. PROJ. (GEF) *L/C/TF Number:* TF-28318

Sector/subsector: Agricultural extension and research (44%); General water, sanitation and flood protection sector (22%); Central government administration (16%); General agriculture, fishing and forestry sector (14%); Animal production (4%)

Theme: Biodiversity (P); Environmental policies and institutions (P); Water resource management (P); Pollution management and environmental health (P)

KEY DATES		*Original*	*Revised/Actual*
GEF Council:	04/01/1996	*Effective:* 03/05/1997	03/05/1997
Appraisal:	06/18/1996	*MTR:* 03/01/1999	03/01/1999
Approval:	07/30/1996	*Closing:* 12/31/2002	12/31/2005

Borrower/Implementing Agency: GOVERNMENT. OF UGANDA / MINISTRY OF NATURAL RESOURCES

Other Partners:

STAFF	Current	At Appraisal
Vice President:	Gobind T. Nankani	Callisto E. Madavo
Country Director:	Judy M. O'Connor	James Adams
Sector Manager:	Karen Mcconnell Brooks	Sushma Ganguly
Team Leader at ICR:	Ladisy Chengula	Graeme Dononvan
ICR Primary Author:	Arati Belle	

2. Principal Performance Ratings

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HL=Highly Likely, L=Likely, UN=Unlikely, HUN=Highly Unlikely, HU=Highly Unsatisfactory, H=High, SU=Substantial, M=Modest, N=Negligible)

	Rating
Outcome:	S
Sustainability:	L
Institutional Development Impact:	SU
Bank Performance:	S
Borrower Performance:	S

	QAG (if available)	ICR
Quality at Entry:		S
Project at Risk at Any Time:		

The overall implementation performance (outputs) is **Moderately Satisfactory**, and the achievement of the development objectives (outcomes) is **Moderately Satisfactory**.

The sustainability is **Moderately Likely**. The Institutional Development Impact is **Substantial**.

The overall Bank Performance is **Moderately Satisfactory** and the overall Borrower Performance is **Moderately Satisfactory**.

The Quality at Entry is rated **Moderately Satisfactory**.

---

3. Assessment of Development Objective and Design, and of Quality at Entry

3.1 Original Objective:

Background and Context: The Ugandan Lake Victoria Environmental Management Project (LVEMP) was prepared during the 1994-97 period, and implemented as one of three interlinked fully blended projects financed by credits (International Development Association (IDA)) and a grant (Global Environment Facility (GEF)) from March 1997 to December 2005. The three projects together sought to address the issues of the lake in a regionally integrated way. They were, thus, conceived as contributions to a regional program (based on the *August 5, 1994 Tripartite Agreement*) implemented as three national projects in Tanzania, Kenya, and Uganda, with common objectives and initially identical components. Given the regional nature of the program and interlinkage of the three projects, the LVEMP Implementation Completion Reports (ICRs) for Tanzania, Uganda, and Kenya should be considered individually and in conjunction with each other, in order to understand both the national particularities in performance and the overall outcomes of the investment. The project assessed by this ICR was the first phase of a long-term program.

The observed project design was necessary at that time due to an absence of regional lending instruments for IDA and lack of institutions to implement a regional approach. The three nations recognized the importance of the Lake Victoria ecosystem as a vast shared resource with great potential for economic growth, but one that was under immense environmental stress. Economically it is very important; the fisheries sector is a significant driver of growth, and water supply, biodiversity, transport, and hydro-energy from the lake underpin vital economic activities. Conversely, the lake, if allowed to degrade, will impose substantial economic and environmental liabilities on the countries, communities, and people of the watershed. Enhanced environmental management of Lake Victoria is, therefore, a key element of a sound program of growth, poverty reduction, and proper management of risks.

Lake Victoria is large and in general shallow. The lake depends chiefly on rainfall for its inflow, and its extensive watershed covers some of the poorest parts in the three riparian nations. When the projects were prepared, the threats to the lake's ecosystem were understood primarily to be diminishing biodiversity, over-fishing, infestation of aquatic weeds (especially water hyacinth), pollution, variation in level, and eutrophication. The transboundary nature and rich biodiversity of the lake were recognized, but detailed scientific and socioeconomic knowledge about the resource was insufficient to support proper management. For example, the inventory of flora and fauna was incomplete and not current. The level of catch consistent with maintenance of the stock of Nile Perch was not known. Infestation of water hyacinth was visible, but the response of the species to various measures of control was unknown. The detailed status of quality of the water was not known; nor were major sources of pollution. Finally, the level of the lake has been observed to vary over time as recorded in historic statistics, but detailed knowledge of the underlying hydrology was not sufficient. Moreover, national and regional institutions and capacity relevant for management of Lake Victoria were weak at the outset of the project, and presented challenges during implementation.

The project was designed in a participatory manner with broadly ranging consultation of stakeholders at the local, national and regional levels. Formulation of the project required multiple negotiations and compromise; between scientists and public servants, between advocates of environmental conservation and those of managed growth, between national politicians with short time horizons and development partners seeking a longer term perspective, and between and among national neighbors with a recent history of tension. The objectives and design that emerged from this negotiation enjoyed sufficient consensus to move ahead, but also attracted antipathy of those who did not see their own objectives fully reflected. During the course of implementation, and even in the assessment in this ICR, strongly held and conflicting opinions have been the order of the day. The ICR team has sought to assess the project not according to what might have been desired by any among the wide range of stakeholders, critics, and advocates, but by what was stated in the project documents and actually accomplished. Due to the vintage of the project, it is assessed according to the four point scale. The text indicates application of the modifiers introduced under the current six point scale where relevant.

Objectives: In light of the circumstances noted above, the objectives the Lake Victoria Environmental Management Project (LVEMP1) were **"to (i) provide the necessary information to improve management of the lake ecosystem, (ii) establish mechanisms of cooperative management by the three countries, (iii) identify and demonstrate practical, self-sustaining remedies, while simultaneously (iv) building capacity for ecosystem management"**. Co-financing from the GEF helped integrate transboundary environmental issues into the design and provide emphasis on them. As noted above, the project is fully blended.

Assessment of Project Objective and Design: The project was the first of its kind in the region, with aims and objectives that reflected the nations' developmental priorities, regional objectives, and global goals. The project was designed in a participatory manner with broadly ranging consultation of stakeholders at the local, national and regional levels. Preparatory activities particularly emphasized community participation and gender issues. The objectives as stated above were consistent with the country-based assistance strategy (CAS) and with the global priorities within the mandate of GEF. The design reflected realism with regard to the time frame required for sound management of the lake, and was phased. The design recognized the need for generation of knowledge, creation of new institutions, and strengthening of capacity. The objectives of the project were thus sound and the process of preparation appropriate. Primary emphasis was placed on activities related to fisheries, which were allocated 41 percent of the allocation of funds. The remaining funds were spread over the other activities in the initial design. Questions have been raised with regard to the proper balance of emphasis on the various elements of the agenda, but the lack of information and inherent uncertainties associated with the various risks to the lake made *a priori* determination of allocations to the various activities difficult. Given the subsequent increased importance of fishing, growth in the catch, and urgency regarding management of the fishery, one cannot with certainty argue that an alternative allocation of resources among activities would have been superior.

3.2 Revised Objective:

The objectives were stated broadly and not changed during the course of implementation. Emphasis within each of the components changed over time, but within the broadly stated goals for the project. At component level, the objectives changed during the course of the project, and underwent change following shifts in emphasis and focus at key milestones (mid-term, the 2003 stock-taking and in the final phase).

3.3 Original Components:

In the joint Staff Appraisal Report (SAR), dated June 1996, the project had the following components (The overall project cost for all three countries of USD 77.7 million was allocated as indicated):
1) Fisheries Management/ Establishment of the Lake Victoria Fisheries Organization (LVFO) (USD 2.28 million)
2) Fisheries Research, including *four* sub-components, Fish Biology and Biodiversity Conservation, Aquaculture, Socioeconomics, Database (USD 13.33 million)
3) Fisheries Extension, Policies and Laws, including micro-projects (USD 14.09 million)
4) Fisheries Levy Trust (USD 2.03 million)
5) Water Hyacinth Control (USD 8.31 million)
6) Water Quality and Ecosystem Management, including one core project, Management of Eutrophication, pilot studies on Sedimentation and Hydraulic Conditions and the construction of a Model of Water Circulation and Quality in the Lake (USD 9.6 million)
7) Industrial and Municipal Waste Management, including one core project, Management of Industrial and Municipal Effluents, pilots on Integrated Tertiary Industrial and Municipal Effluent Treatment, each, and a component for Priority Waste Management Investments (USD 9.89 million)
8) Land Use and Wetland Management, including two core projects, Management of Pollution Loading (addressing non-point sources of pollution) and Buffering Capacity of Wetlands and four pilots - Assessment of the Role of Agro-chemicals in Pollution, Integrated Soil and Water Conservation, Sustainable Use of Wetland Products, and Afforestation (USD 14.1 million)
9) Institutional Framework, including Support to Riparian Universities and the Coordinating Secretariat (USD 3.98 million)
Please see Section 10, for more details on the components.

3.4 Revised Components:

Due to significant delays in the start-up of the program discussed below, at the mid-term review (MTR),

many of the components and sub-components were revised. Work programs were adjusted to facilitate implementation within the existing institutions and according to the mandates of those institutions. This revision entailed somewhat lower expectations regarding cross cutting issues and coordination, but also freed up implementation to proceed within the components. The scope of several activities and components was narrowed, but still within the overall objectives and targets for the program. In the design, the scope of activities was differentiated as being lake-wide or as pilots, an approach that was largely maintained during implementation, although mirroring the changes in the components. Changes within the components created some confusion regarding the links between the components and overall effort, and the relatively weak coordination among components did little to restore focus on strategic objectives. Support for the LVFO was subsumed into the Fisheries Management component. The cross-cutting issues of community participation were overseen by an officer in the Secretariat, and this was a suitable arrangement. The scope of Micro Projects was expanded beyond fishing communities to include communities in the catchments with good result. The original Land use and Wetland component was broken into two. The Industrial and Municipal Waste Management retained its component status in Uganda (unlike in the other two riparian countries), separate from the water quality research activities, resulting in greater emphasis on these activities and closer involvement of the National Water and Sewerage Corporation. These changes were largely a reorganization of the components and did not constitute a restructuring of the project with different objectives or sub-objectives. The final list of components and sub-components in Uganda at the end of the project, with major changes indicated, is listed in Section 10, table 1.

3.5 Quality at Entry:

Moderately Satisfactory. LVEMP charted new ground both in the countries and in the Bank. It was a regional project addressing transboundary concerns during a time when little regional cooperation existed between the riparian countries and few regional instruments and institutions were available. The project design was consistent with CAS and country developmental priorities and the preparation was highly consultative. The SAR presents a fairly clear design that is technically sound and describes the path of the overall program. Importantly, its approach was based on the Lake Basin ecosystem perspective and it included the main thematic areas addressing the key environmental issues afflicting the Lake. This helped lay the basis for the subsequent development of a common vision for the management of the transboundary resource. The first phase emphasized research and collection of data. Critics have frequently argued that greater weight should have been accorded, even in the first phase, to creation of environmental management tools and their application in management that would have achieved a measurable change in environmental indicators of the lake. Those who hold this view recognize the required sequencing; i.e., that knowledge has to precede decisions based on the knowledge, but they argue that more use should have been made of the knowledge. The design was weak in specifying appropriate data collection strategies for translation of data into relevant information and outputs usable for operational management and solutions for the lake as a whole.

The design was optimistic in scope, with a large number of components, and requiring coordination between a variety of institutions in each country and between countries. The plethora of implementing agencies and activities resulted in complicated budgeting and accounting systems. Capacity to implement was weak, and enhancement of capacity was one of the objectives of the program. Full attainment of objectives would have required not only competent implementation of each of the components in each country, but also regular sharing of findings among components both within and among countries. The structure established (national coordinators and a regional secretariat) was too weak to perform adequately, and the shared strategic focus took a long time to emerge. The project did not include a technical policy and steering committee at the national level specifically mandated to monitor progress on technical issues and ensure coordination among the participating ministries and institutes. The design did not include a logframe because that was not customary at the time. The project very much needed an alternative to the

log frame; i.e., a practical guide to action and clarity on the results expected. Key performance indicators were established late in the implementation (in 2004) during an attempt to retrofit a log-frame.

On several relevant dimensions of project design; i.e., consistency of the objectives with the CAS, technical coverage and priorities, and consultation with relevant stakeholders, the design was very strong. On the critical dimension of readiness for implementation it was weak, and this weakness was costly for the performance of the project. Nevertheless, changes introduced at the MTR allowed implementation to accelerate within the components and funds to flow. The changes did not entail a major restructuring of the project or revision of the initial design, and the project was after the MTR largely able to make up for lost time. Because a number of dimensions of design were strong and the deficiency in readiness for implementation was remedied at the MTR, the quality at entry is assessed as being satisfactory, but moderately so.

4. Achievement of Objective and Outputs

4.1 Outcome/achievement of objective:

The overall implementation performance (outputs) was **Moderately Satisfactory**, and the achievement of the development objectives (outcomes) was **Moderately Satisfactory**.

This evaluation assesses the project's performance against the objectives for the first phase:

Provide the necessary information to improve management of the lake ecosystem

The project supported many knowledge-building activities that advanced the understanding of the Lake Ecosystem, particularly in the areas of biodiversity of fish (establishing a baseline), levels and sources of pollution, fish stocks, and hydrology. Great emphasis was placed on data collection and less on analysis, collation and dissemination, although a substantial body of work was taken to the stage suitable for publication. Because the scientific challenge is enormous and ongoing, many findings are provisional. Among the most important that were not known at the outset of the project are the following:

- Biodiversity of fish has declined, but many species thought to be extinct in the watershed are in fact present in refugia in satellite lakes.
- A sustainable catch of Nile Perch is probably within the range of 220,000 tons annually (trawl surveys) to 350,000 tons annually (acoustic survey).
- Point sources of pollution are important locally and have effects on public health, but are not the largest sources of phosphorus and nitrogen exacerbating eutrophication of the lake.
- Eutrophication is primarily due to nitrogen and phosphorus from atmospheric deposition although the relative contribution of the catchment to it is yet unknown.
- The lake level has varied significantly over time and is highly sensitive to small changes in the balance of inflows and outflows.
- Constructed wetlands can be effective measures to enhance the contribution that natural wetlands make toward water quality.
- Water hyacinth can be effectively contained in the lake through biological control (weevils), but weevils are less effective in the rivers that flow into the lake.

Establish mechanisms of cooperative management by the three countries

The three countries made considerable progress in advancing the regional perspective in both planning and implementation. The LVFO was operationalized, although it requires strengthening. Fisheries sector frameworks were harmonized. Regional information exchange was strengthened. Regional synthesis reports were prepared and experiences on catchment management were shared. During the course of implementation of the project, the East African Community (EAC) was re-established and recognized

coordination of activities in Lake Victoria as among its priorities. Although the role of the EAC was not foreseen during preparation of the project and required some adjustment in understanding of responsibilities, it has been an important breakthrough in facilitating shared management. The EAC passed the Lake Victoria Protocol and, with its ratification by member states in November 2004, created the Lake Victoria Basin Commission (LVBC) to be based in Kisumu. Subsequently, a common Lake Victoria vision was developed by the partner states. Through the EAC and LVBC, it is hoped that the riparian states will be in a much stronger position in the future to act on the enhanced knowledge about the lake by agreeing on common enforcement of standards and regulations, some of which are now on the books but unevenly enforced.

Identify and demonstrate practical, self-sustaining remedies

The project contributed significantly in establishing and strengthening co-management of natural resources. The participatory approach combined with micro-projects proved to be successful and cost-effective while increasing local livelihoods and empowering communities. Lessons learned were relatively well captured in reports. Many of the microprojects remain active without incremental funding. Not all of the micro projects selected by communities had direct relevance to the environmental agenda of the project, but a broad menu including service delivery was foreseen in the SAR. Water hyacinth infestation was reduced to non-nuisance levels through introduction of the weevils, and the symbiotic relationship between the insect and plant populations provides biological sustainability; i.e., when the hyacinth expands, the weevil population grows to bring it back into check. Work of the fish quality lab resulted in lifting of the temporary European Union (EU) markets' ban on import of fish from the lake, and the quality lab is partly functional. Better land management in the catchment and wetlands contributed to the reduction of silt and pollution entering the lake. Uganda was the only one among the partner states to make progress on reducing direct point source pollution entering the lake through the rehabilitation work on the Bugolobi sewerage treatment plant, which led to an improvement of 19 percent in the BOD in its wastewater.

Building capacity for ecosystem management

Most of the activities in the project were oriented towards capacity building. Important experience was gained in scientific research and resource management, while technical skills were upgraded and the implementing institutions were equipped. Staff were trained in advanced degree courses (M.Sc. and Ph.D.) and others received on-the-job and short courses training. Capacity building and awareness raising campaigns targeted local communities through a variety of instruments (use of local media, training days, workshops, study tours etc.) Capacity building efforts were uncoordinated and opportunistic, rather than based on a well-defined strategy addressing identified needs. Future efforts should be better targeted and impacts of capacity building should be assessed.

Overall, in Uganda the pace of implementation improved following changes made after the mid-term review, with two periods of slowdown, accounting for two years in all, due to fiduciary related blocks. The implementation was weakly guided by a strategic orientation toward results and instead achieved sequential incremental progress. The lack of strategic focus impeded prioritization and fed insularity within the components. Activities under the project were weakly linked to the ongoing work of the relevant ministries. Lack of emphasis on cost effectiveness, efficiency, and consistent quality assurance reflected weakness in technical and administrative management. This was a fully blended IDA/GEF project, with shared objectives for both sources of funding. One particular focus of the GEF support was elaboration of a strategic framework for a large program of investment, particularly on municipal waste management and soil conservation, that has not resulted to date, although substantial investment was not foreseen in this phase of the project. The project's marginal success in addressing direct pollution from point sources diminished achievement of goals for water quality.

Despite diminution in accomplishments due to difficulties in implementation, the project is judged to be moderately satisfactory in meeting outputs, and moderately satisfactory in meeting objectives stated for the first phase. The achievements noted above were accomplished for the most part jointly by the three riparian countries, with Tanzania most effective in its contribution, Uganda second, and Kenya lagging far behind the others. Uganda's intermediate position in this shared effort makes determination of S or U a call of judgment more than is ordinarily the case with an ICR. This ICR assigns Uganda a rating of satisfactory, but moderately so on both outputs and objectives, and with recognition that the contribution of the stronger partner, Tanzania, enhanced the accomplishments of its somewhat less successful neighbor. Moreover, the assignment of S to Uganda is made strictly relative to the stated objectives of the project. Decisions taken over the last two years within Uganda but outside the purview of this project have exacerbated the recent fall in the level of the lake. If not reversed, overabstraction from the lake within Uganda will undermine the accomplishments of the first phase of the Lake Victoria program for all the partners, and radically shift the emphasis during the second toward preserving the level of the lake as the supreme priority over all others.

Please see Annex 8 for a Summary of Regional and Transboundary Related Issues.

4.2 Outputs by components:

Please see Figures 1 and 2 in Annex 9 for the Timeline of the Project and Overall Project Structure. Also please see section 10 for details on component objectives, as stated in the SAR, and outputs.
The following section assesses the various component outputs and reveals a mixed picture.

Fisheries Management

Marginally Satisfactory. This was the largest component of the project addressing both enforcement and extension, particularly related to aquaculture. It supported the development of co-management institutions or Beach Management Units (BMUs), strengthening community participation in resource management. The institutional change helped improve the effectiveness of fisheries extension and strengthen fish quality assurance. The component achieved notable success in harmonizing the fisheries legislation and regulatory frameworks among the three countries, but could not operationalize the Fish Levy Trust (FLT) in Uganda, as the legislation awaits approval. Many concerns remain regarding the management of fisheries in Uganda in the context of over-fishing. Evidence of the estimates of catch per unit effort indicates declining stocks. Processing capacity is excessive (actual processing utilizes half of installed capacity), and this contributes to continued overfishing.

Fisheries Research

Marginally Unsatisfactory. The component generated data on the biology and ecology of the lake and some of its satellites, contributing to the compilation of a biodiversity baseline. Activities emphasized gathering of data, with less attention to analysis and policy implications. Quality control of outputs including the synthesis report, a compendium of research results, was not adequate. The quality of the national synthesis report could be strengthened with a deeper analysis of the factors driving the status and trends, by providing insight into the impact of environmental factors and distilling the key messages for policy and management. The component suffered from initiation of multiple activities, not all of which could be continued with the limited funding of the bridging phase.

Water Quality and Ecosystem Management

Marginally Unsatisfactory. The component emphasized data collection; analysis was conducted on only a portion. A synthesis report was prepared. A monitoring framework was put in place but the planned frequency of monitoring was not attained as a result of several logistical constraints that created gaps in seasonally collected data. The lack of time-series data prevented conclusive analysis. Planned sedimentation

studies were not completed. A Water Balance Model for Lake Victoria was established, data analyzed and the water balance of the lake estimated. The effort at comprehensive lake modeling exceeded capacity at this stage, and was not fully successfully undertaken.

Water Hyacinth Control

Highly Satisfactory. Even though the component sought primarily to strengthen capacity, implementation was able to move further and address the problem itself. Water Hyacinth infestation has been reduced to biological equilibrium levels representing an approximately 85 % reduction of the previous levels.

Wetlands Management

Satisfactory. The component activities were fully mainstreamed into the national institution. A wetlands baseline was established and information on the functionality of wetlands as buffers was generated. Capacity building and support to community based activities were focused on income generation through sustainable use among 200 communities. Important research was undertaken related to rattan propagation. This wetland resource has a high economic value and consequently is in considerable demand for construction, handicrafts, furniture production etc. Thus, natural stocks were being rapidly depleted, but stocks were partially restored through activities of the project. A simplified propagation technology was developed that was usable by local communities. This technology was adopted by four communities around the Mabira forest who are growing rattan in the degraded areas of the forest under a Joint Forest Management Initiative.

Soil and Water Conservation

Satisfactory. The component was able to demonstrate some success in Rakai district through a systematic approach towards land degradation in coordination with the agricultural program, NAADS. The experience should aid in scaling up. This component was targeted and had a strategic approach that greatly enhanced its effectiveness. The on-farm participatory research was very effective, as substantiated by farmer satisfaction. Where improved practices were promoted in Rakai district under the project, area of adoption increased ten fold relative to the baseline. Adoption did not spread spontaneously outside the pilot areas despite the evident benefits. Studies exploring the low adoption rates of land management identified lack of familiarity of farmers with the technology as one of the key reasons, as well as high up-front costs and land tenure issues.

Catchment Afforestation

Marginally Unsatisfactory. The component worked with local institutions and communities to develop community nurseries. Work began ambitiously with 42 nurseries but subsequently scaled back to 25, producing 5.7 million seedlings with a 48 percent survival rate. Multiple efforts to improve forest reserves, targeting strategic locations, through rehabilitation and afforestation were largely not successful. Intensive campaigns were undertaken among communities to increase demand for on-farm tree planting. The nurseries did not invest sufficiently in developing local demand separate from that of the project, and their viability is now in question.

Capacity Building - Support to Makerere University, Department of Zoology

Marginally Satisfactory. Staff of the University and components were trained and the Department was equipped with facilities, including an accredited microbiology and genetics laboratory that is partially operational, and an aquarium.

Institutional Framework - National Secretariat

Marginally Unsatisfactory. Problems with procurement and flows of funds constrained implementation

throughout the much of the life of the project. Operational processes in several areas were lacking or weak. On the procurement issue, a critical concern was the lack of a structured process of communication with and involvement of the end-users. Matters improved only after the second procurement officer took over, by which time the bulk of the procurement had been completed. Funds flowed erratically, with little predictability or planning. Consequently, although work plans were prepared and discussed in multiple fora, decision-making could not be systematic or according to plan. Thus, the work-plans did not serve effectively as a management tool, and the allocation of available funds could not follow work plans. Finally, staff of the secretariat were on consultant contracts with generous remuneration packages, and this created tension in working relations between them and other staff. Coordination between the components could have been strengthened had transparency and trust featured more strongly in the relationship between the staff of the components and the Secretariat. Staff of the secretariat were not receptive to suggestions for improvement or oriented toward results. Thus, although accomplishments of the project were substantial, they were largely the result of the work done within the components separately from the contribution of the national secretariat.

Micro-projects and Community Participation

Satisfactory. The activities of the subcomponent led to increased capacity in the communities and improved livelihoods, in some cases with additional positive impacts on the environment. Microprojects proved to be strong incentives for community involvement and created opportunities for implementing a range of approaches to improved livelihoods or environment or both. 117 micro-projects were implemented. Community participation was strengthened across a number of the components and was found to have a positive impact on awareness and skills. Impact of individual projects was not monitored or assessed.

4.3 Net Present Value/Economic rate of return:

A standard ERR was not estimated in the SAR, as is the case in projects with a major emphasis on capacity strengthening and institutional development. The section aims to provide some indicative socio-economic data and a discussion on the Potential Benefits, as done in the SAR.

Among the gross benefits expected in the SAR, are avoided losses related to decline in fishery as a result of over-fishing and deterioration in water quality, impacts of water hyacinth infestation, poor quality of water supply for domestic and animal uses, and continued degradation of wetlands.

It is estimated that fisheries contribute about 3 percent of GDP in the riparian economies. Fish production for the whole lake is currently estimated to be between 400,000 to 600,000 metric tons worth USD 400 to 600 millions annually. Export of fish from the entire lake is estimated at USD 270 million. Current off-take is probably in excess of a sustainable yield, indicating that enforcement of more limited harvesting will be one of the critical issues for the second phase of the program.

There was a decline in values from exports due to the import bans imposed by European markets in 1999 and 2000 because of phytosanitary concerns. Measures by the project to strengthen quality assurance helped remove the bans. A rough estimation of avoided losses in the period 2000-2004 (see table in appendix below) is around USD **28 million,** while the cost of the quality assurance subcomponent was USD 0.7 million and the overall Fisheries Management component was USD 4.7 million.

A cost benefit analysis was conducted to value the various benefits and services, including use values (materials etc.), other uses such as agriculture, livestock, fishing, and environmental services and option values, gained from wetlands, which was estimated at **USD 56 million** per annum. The study developed three scenarios with increasing levels of management interventions and estimated their costs at USD 3.9 million, USD 6.3 million and USD 30 million per year.

The Lessons learned report for Land Use Management provides a good analysis of land degradation and the impacts of land use measures on productivity and environmental services. It estimates that USD 9.6 million is lost each year due to soil erosion.

The cost-benefit analysis for wetlands valued the benefits of tertiary treatment by the natural Nakivubo wetland through which the partially treated sewage from Kampala's treatment plant (Bugolobi) and storm water flow before entering the Lake, to about **USD 1.7 million** per annum.

The SAR estimated that the wide-range of direct costs on the lake community as a result of the spread of water hyacinth, including those arising from transportation (delays in transport, increased operation costs, loss in fishing time, increased difficulty collecting water, blockage of intakes and loss of production at urban and industrial water supply systems), to about USD 6-10 million per annum. The Water Hyacinth infestation has been reduced to non-nuisance levels. Indicative avoided costs range to more than **25-40 million** in the period 2000-2005 for the whole Lake**.** (Please see Annex 3)

4.4 Financial rate of return:

The financial rate of return was not estimated in the SAR.

4.5 Institutional development impact:

The overall rating for institutional development impact is **substantial**.

Institutional development was one of the objectives of the project and nearly all the components' activities contributed to it. Significant achievements included the shift in fisheries management towards co-management and a rich experience in community based management in the catchment. Beach management units (BMUs) and community common interest groups were established providing effective service delivery as well as promoting community participation and empowerment. Fisheries regulatory and policy frameworks were strengthened and harmonized across three countries. The project helped the countries in handling the EU ban on fish exports due to quality concerns by strengthening the quality assurance processes. The project contributed to reducing the significant capacity gaps through training; e.g., 14 Ph.D. and 20 M.Sc. both locally and abroad in a wide range of disciplines including fisheries science, environmental management, and information systems among others. Numerous others were trained on-the-job and through short courses. Better trained personnel contributed toward stronger institutions. The LVFO was established. When the EAC was re-established and became active in the Lake Victoria program, the activities under the project helped in formulation of the Lake Victoria Protocol and in the subsequent creation of the LVBC.

The impact of the institutional development could have been greater had the training been undertaken in a more strategic and focused way, and the activities supported under the project mainstreamed more effectively into the day to day work of the relevant ministries. For component specific details, please see section 10.

5. Major Factors Affecting Implementation and Outcome

5.1 Factors outside the control of government or implementing agency:

The key factors influencing implementation include: (i) Uneven performance of the other two partners and limited ability to influence that performance. Progress in Kenya was stalled first by problems with flows of funds and subsequently by a level of performance insufficient to justify extension of the IDA credit. Activities that required shared funding; e.g., synchronized collection of data, suffered from the varying pace of implementation among the partners. (ii) The falling lake level, by over two meters since 2003, was

caused partly by the prolonged drought and partly due to over-abstraction of water for hydro-power generation by Uganda. The falling level had serious impacts on the fisheries and wetlands. Assets of the BMU's (fences, jetties etc) were no longer usable and the spawning grounds were affected. Many wetlands are threatened. The overall ecological and economic impact of this issue has not been estimated but is considered to be large. This development was outside the control of the implementing agency. Since overabstraction is taking place within Uganda, however, and in contravention to existing international understandings on the allowable abstraction, it is within the purview of the Government to address, although the issues raised are difficult ones. The project provided a forum for the partners to recognize and begin to address the declining lake level, a dialogue due to which over-abstraction has declined in recent months. (iii) The drought affected implementation of catchment based activities in the soil and water conservation and catchment afforestation components. (iv) The ban on fisheries due to fish quality concerns by the EU, the main market for the commercial Nile Perch, led to additional focus on quality assurance. The ban was occasioned by a concern that was outside the control of the government or implementing agency. The efforts by the project to strengthen quality assurance resulted in the ban being lifted. (v) Inflows of water hyacinth from Rwanda and Burundi through the River Kagera constantly replenish weed levels.

5.2 Factors generally subject to government control:

The systemic issues related to disbursement were a critical factor that significantly hampered project implementation in Uganda. Flows of funds were frozen or delayed substantially several times bringing various activities to a halt. In 1998 flows stopped for a period of six months because counterpart funds were not forthcoming. Counterpart funds were consistently below budgeted amounts, with annual disbursement average of 68 percent over the project period. In 2003 Parliament held up the approval of the supplemental credit for 17 months, resulting in an effective project implementation gap of nearly two years. In 2004, the Government shifted project funds from a commercial bank to the Bank of Uganda without consultation with the World Bank and the implementing agencies. This led to a delay of several months till the project was permitted by GoU to reopen the special account in a commercial bank.

The Government has not been consistent in maintaining policies conducive to sustainable fishing. For a period the Government lifted the ban on harvesting of undersized fish, and then in response to criticism, reinstated it. Energy policy and pressures to provide increased energy for a growing economy have led to overabstraction of water for hydropower generation, with deleterious impact on the level of the lake.

Closer oversight of project management by responsible governmental officials and requirements for higher standards of performance would have contributed to better outcomes. Some positive factors that contributed to success of the project arose due to actions of government not fully foreseen at project design. Cooperation between the three countries, with free inter-country movement of project implementation staff facilitated the harmonization achieved by the project and enhanced its the regional status. The revival of the East African Community(EAC) and the creation of the LVBC cemented the regional linkages, and these outcomes were clearly due to efforts by the riparian governments.

5.3 Factors generally subject to implementing agency control:

Two and half years were required to establish, equip and staff the project. This long start-up period cut into the time for implementation and necessitated a refocusing and narrowing of the project activities. Indicators and targets were not clearly specified, with the result that tracking of progress became ad-hoc and subjective. No explicit mechanism was put in place to ensure that the results from the project were mainstreamed into the long-term plans of the respective agencies. Project coordinators represented the mainline agencies but the degree of their interaction and communication with project staff varied considerably across components. The relationship between the secretariat and the components often became

a factor affecting the implementation progress. Delays in accountability for funds continued throughout much of the life of the project. These factors could have been addressed by a more effective and responsive implementing agency, particularly a better secretariat.

5.4 Costs and financing:

The appraisal estimated project costs at USD 28.05 million financed by an IDA credit of USD 12.09 million, GEF grant of USD 13.14 million and GoU funding of USD 2.83 million for the initial period of 1997-2002. A supplementary credit was approved in 2002 of USD 4.5 million brought the total IDA credits to USD 16.6 million. Supplemental financing was justified by the need to coordinate the timing of ongoing project activities with that of the other two partner countries. Actual Expenditure at the close of the project in December 2005 was IDA 13.12 million, GEF 15.24 and GoU Ush 3.29 billion (approximately USD 1.94 million). As work programs within components were revised, resources were reallocated between and among them. For example, the secretariat was originally budgeted for about 3 percent of the cost, and ultimately absorbed an estimated 15 percent of funds. Please see tables in Annex 2.

6. Sustainability

6.1 Rationale for sustainability rating:

Moderately Likely. In assessing sustainability of the project, the ICR team has proceeded with an understanding that much of the investment falls into the category of public goods and services with an ongoing and appropriate role for public expenditure. Sustainability under these circumstances requires evidence of continued commitment by government to allocate the needed public funds, an institutional foundation to assure that activities that warrant continuation will be carried on, and public awareness sufficient to secure continued public support through the electoral process. In this context the first phase interventions are likely to be sustainable due to the following:

Financial sustainability – The Government has made a commitment within the Medium Term Expenditure Framework (MTEF) to include activities initiated under the project in the budget projections and programs for its mainline agencies. Further, the Government has committed USD 1 million as its contribution to the Bridging Phase to continue core activities from the first phase prior to the period when the second phase of external funding becomes available. Policy and decision-makers increasingly support the integrated management of the Lake testifying to the recognition of the public good aspects of the longer-term program. The study tour organized for parliamentarians to break the Parliamentary blockage of approval for the supplemental financing was very effective, and that, combined with current concern over the level of the lake, has greatly increased parliamentary support for the program. The shift from the financial basis of the first phase (largely project-based and not fully included in the MTEF) to that of the second phase will entail careful assessment of which activities to continue, which to expand, and which to wind down. That assessment is being undertaken through the preparation process for the second phase and is not yet complete, and when it is, not all activities will be retained. Nonetheless, a strong basis for financial sustainability of the overall program is in place within the budgetary framework and agreed modes of external assistance to Uganda.

Institutional sustainability – The project enhanced institutions and generated momentum towards an integrated approach for the management of Lake Victoria and its catchment. Political commitment has been increased through information and creation of awareness among a wide section of stakeholders. The participatory approach and co-management of resources followed by the project, while time consuming to establish, contributed to sustainable results, especially when combined with adequate regulatory and monitoring mechanisms. The strong move towards regional cooperation will help strengthen planning and joint management activities. The LVFO is in place and functioning, although it needs strengthening. A

decision has been taken to form a comparable organization for water, both quality and level. The Lake Victoria Protocol is ratified by the three riparian states. The EAC has formed the LVBC to serve as a coordinating body. Finally, Rwanda and Burundi, two partners minimally active in the first phase but important for the maintenance of the watershed, have actively sought to join the second phase and are clarifying their relations with the EAC. Because of the increased visibility of the Lake Victoria agenda and its enhanced recognition within the governmental bodies of the riparian states, the difficulty experience in the first phase of embedding activities in the main ministries will be less problematical in the future. For these reasons the outlook for institutional sustainability is good. Internal quality control and management processes (particularly for research) must be strengthened to enhance relevance and assure that the activities mainstreamed into the institutional structure are in fact delivering the needed results.

Environmental sustainability – Achievement of significant positive environmental outcomes in Lake Victoria is a long term process, and the project was appropriately modest in its ambitions in this regard. It did, however, affect, on a limited scale, the inflows caused by erosion through its soil and water and afforestation activities. The project's contribution to reducing effluents through its planned priority investment activities was negligible, although more successful in Uganda than in the other countries. Continued over-exploitation of fisheries remains a concern, since the present offtake is not within the range of catch estimated to be sustainable. The decline in the level of the lake during the first phase confirms the vulnerability of the level to changes in abstraction and precipitation. The research and consultative mechanism put in place under the project contributed toward actions that brought attention to the problem, and may have halted the over-abstraction. The lake is presently rising, but the longer term prospect is not yet clear. The current status of the fish stock, water quality, and the level of the lake confirm the need for clearly specified environmental indicators in the second phase and agreed and enforceable mechanisms to achieve the indicators. Furthermore, environmental assessment of the micro-projects should be enhanced and built into the environmental capacity of the local governments in the watershed.

For component specific details, please see Section 10.

6.2 Transition arrangement to regular operations:

LVEMP 1 was planned and implemented as the first phase of a long-term program, intending to develop the knowledge base and capacity for subsequent management and development of the lake and basin. Extensions of the first phase (due to the varying implementation pace among the three countries) and the delays in start-up of the preparations for the expected next phase resulted in a funding gap for one and half years. This period, called the Bridging Phase, is being supported by EU and Sida. Due to the decrease in the level of funding, the scale of intervention has been reduced to core activities allowing a continued momentum to be maintained till the next phase is fully designed. The planned second phase is intended to contribute to the achievement of the regional (EAC) Lake Victoria Development Vision of having: “a prosperous population living in a healthy and sustainably managed environment providing equitable opportunities and benefits to the riparian communities.” Its expected development objectives are to: (i) Strengthen regional and national institutions for coordination of sustainable management of the transboundary Lake Victoria basin resources; (ii) Facilitate environmentally friendly investments in the Lake Victoria Basin; and (iii) Enhance conservation of biodiversity and genetic resources of targeted fish species. The second phase will draw on the lessons learned from the implementation of the first phase and is likely to focus on four main areas: (i) Building the information base for governance and growth; (ii) Strengthening governance of transboundary natural resources; (iii) Enhancing sustainable economic growth; and (iv) Raising public awareness through education and communication. The project costs are expected to be financed by IDA credit, bilateral donors and borrowers' counterpart funds. GEF support will be contingent on availability of funding under GEF4 and on completion of the ongoing Regional Transboundary Diagnostic Analysis (TDA) and the Strategic Action Plan (SAP), likely to be completed in

November 2006. Implementation of the activities of the second phase will be largely through national programs, and coordination will be assumed increasingly by the EAC, and specifically the Lake Victoria Basin Commission.

7. Bank and Borrower Performance

Bank

7.1 Lending:

Moderately Satisfactory. Identification of the project began in 1992 but preparation began in earnest in August 1994. The Bank helped the three riparian states embark on the first major regional project contributing in part to the renewed EAC cooperation later. The Bank promoted a comprehensive approach to the lake's problems and encouraged community participation and community based activities, gender mainstreaming and stakeholder consultations at a time when the local experience to date had been neither participatory nor inclusive. The Bank's team facilitated a path between the multiple competing views of the problems and the variety of objectives/perspectives for the project evinced by the numerous stakeholders. As noted by the then task team leader, 'almost everything in the project was a carefully crafted compromise.' Given this context, preparation was done in a highly participatory and consultative way. Some of the tensions between the varying views, however, were not fully resolved and were reflected in the implementation of the project. Preparation missions were sufficient but did not fully anticipate or address the lack of capacity and weaknesses in operational management. The project design was strong on conceptual and technical merits but it was not translated by the countries into appropriate institutional set-ups for implementation. Weaknesses in prior planning (especially of financial management and procurement) translated into an effective delay of two and half years and impeded coordination between and among components and across national boundaries. The preparation team appears to have been overly optimistic about the capacity of the implementing agencies to perform. Changes introduced at the MTR, however, allowed implementation to accelerate without requiring a substantive restructuring of the project. Given the elements of the preparation that were strong and the subsequent correction of those that were weak, the overall assessment of lending is moderately satisfactory.

7.2 Supervision:

Moderately Satisfactory. The chronology of the supervision record shows considerable variation both over time and in terms of issues focused on. Overall, the Bank underestimated the time and resources needed to supervise a regional project of this size. Missions were conducted annually (mostly in the beginning of the project) and semi-annually (mostly during the last years of the project). Supervision teams included specialists, staff and consultants with different areas of expertise (fisheries, watershed management, institutions etc.). The missions included variously donor representatives, regional scientific experts and project staff from other riparian states as observers. In the first two years supervision attention was aimed at operationalising the project. Subsequently, and following changes in the implementing arrangements, close supervision and intensive technical support led to increased disbursements and progress in implementation of various component activities. The Bank assisted greatly in the overhaul of the components, matching them to the institutional structure. It also helped untangle many of the structural issues that had derailed financial and procurement processes (seven month delay in counterpart funding in 1998, Parliament’s delay in approval of the supplementary credit for 17 months in 2002/03, transfer of the project account to the Bank of Uganda, tangled procurement). A belated but strong exercise to retrofit a logframe and monitoring indicators was undertaken in 2004 as a result of the stocktaking exercise conducted in 2003. The subsequent approach of the team was to guide the project in collating the results of the research into specific concrete outputs, resulting in the production of regional and national synthesis and lessons learned reports.

Successful support for implementation of this challenging project required a team able to focus

simultaneously on the big picture and on detail, and the Bank was not consistently able to assure both perspectives. Team leadership changed five teams, and the changes brought varying professional backgrounds and skills. The supervision record indicates significant differences in the framework and approach towards both technical issues and supervision styles by the various teams. This resulted in lack of consistency in the realism of supervision ratings and some gaps in the hand-overs. The teams worked intensively and conscientiously, and contributed toward the realized accomplishments of the project's objectives. The team was, however, not fully able to compensate for relatively weak managerial capacity within the implementing agencies, nor for the absence of a clear focus on strategic objectives and indicators.

The issue of over-abstraction of water for generation of hydropower and its contribution to the declining lake levels deserves particular attention in this ICR because of its implications for the objectives of the project and more fundamentally for the future of the lake. Overabstraction began in 2000 at modest levels and accelerated sharply in 2004. Between 2000 and 2003 the level of the lake declined modestly within a range consistent with recent historic fluctuations. With the accelerated abstraction in 2004 the cumulative decline in the level moved below the range of recently observed values. The Bank team identified the issue and drew it to the attention of the project teams in October 2004 and during the subsequent mission in April 2005, when it highlighted the issue to the Bank management through the aide-memoire of that mission. In retrospect and given the severity of the continued decline in the lake level, the Bank has come to the conclusion that it could have acted faster in elevating the issue in country dialogue. The supervision team continued to gather the necessary evidence to identify the relative contribution of the prolonged drought East Africa has experienced over the past two years and the overabstraction for electricity generation, towards making a stronger case for action. It continued to work through the implementing agencies to raise the issue with their governments. With more definitive evidence, the issue was brought to the attention of the Bank Management and the EAC (in late 2005). Thus, approximately one year passed before the Bank was able to more fully mobilize internally. During that time the process within the riparian countries initiated under the project had brought the matter onto the agenda of a Summit of Heads of State. In response to the Summit, the overabstraction has declined, but not yet to the degree needed to arrest or reverse the decline in the level. Consultations among the countries continue. The Bank's own assessment therefore is that with regard to the issue of the declining lake level the Bank's response was not satisfactory. Restoration of the level of the lake requires a multi-sectoral response both within Uganda and within the Bank, since sources of energy other than hydropower will be required. Addressing Uganda's growing energy needs in ways that are consistent with proper management of Lake Victoria is now a high priority in the Bank's program of assistance to the country.

7.3 Overall Bank performance:

Overall, the Bank performance is **Moderately Satisfactory**. This is consistent with the assessments conducted by the stocktaking exercise, QAG (for supervision in 2004) and IEG (evaluation of the World Bank's Support for regional programs), which found the Bank's performance overall satisfactory.

Borrower

7.4 Preparation:

Moderately Satisfactory. The Governments of the three partner states displayed ownership and commitment to the visioning and planning of the project. The SAR was based on project planning documents prepared by each of the countries. The three countries addressed the lack of regional mechanisms needed to implement a transboundary intervention by signing the Tripartite Agreement of 1994 that supported cross-country cooperation and advanced the development of regional frameworks. Impediments to implementation, including weak capacity and insufficient oversight by line ministries and coordination among components created difficulties initially that were partly but not completely resolved

subsequently. The same reasoning that pertains to the Bank's performance in preparation (see above) is appropriate for the Government's performance, and a rating of moderately satisfactory is assigned.

7.5 Government implementation performance:

Unsatisfactory. It is often the case that the Government, the implementing agencies, and the Bank equally share responsibility for success or difficulties in implementation. In the present case, however, distinct actions solely within the purview of the Government created obstacles that impeded implementation. For example, the fish levy trust is not operational, as it awaits the legislation of the Fisheries Bill. The Government has not been receptive to measures needed to achieve sustainable fishing, and for a brief period rescinded the ban on taking of undersized fish. The overabstraction of water leading to the decline in the lake level has not been undertaken directly by the Government, but was within the Government's purview to stop, since it contravenes international understandings on abstraction expressed in the Agreed Curve. The Government's performance on its budgetary commitments has not been conducive to efficient implementation of the project. Only 68 percent of the approved budget was released over the nine year period of the project. Bank disbursements were held up in 1998 due to a seven month delay in the release of counterpart funds. Subsequently, in 2002-03, Parliament delayed approval of the supplementary credit. In late 2004, the Ministry of Finance moved the special account to the Bank of Uganda without adequate consultations with the Bank, resulting in a halt in operations for three months till the special account was reinstated in the Commercial Bank. Since many of the activities were time-limited (in particular seasons/times), this rendered the activity less useful when the funds were eventually available. For all of these reasons the Government's performance in implementation is judged overall to be unsatisfactory, although particular agencies within government have consistently been deeply committed to the agenda.

7.6 Implementing Agency:

Moderately Satisfactory. The project is judged to have achieved at least moderate success in attaining its objectives (see above), and this implies satisfactory performance by the implementing agencies, since no one else could have done the job. Much of the success must be attributed to diligent and persistent actions within the components, since overall leadership of the secretariat, as argued above, was weak. There were eight main institutions/ministries, involved as primary implementing agencies in the projects in Uganda. There was considerable variation in the intensity of oversight and guidance by the various component leaders (notably successful teams included Industrial and Municipal Waste Management and the Land Use components) with the result that on-site team leaders, some of whom were contracted, largely managed their own activities, often with laudable results. The lack of mainstreaming, and poor technical and administrative management contributed to activities being supply-driven, with over-emphasis on collection of data that were not always analyzable, inadequate prioritization of research programs, weaknesses in quality assurance of the knowledge outputs and mixed performance of the pilot activities. The project helped establish the LVFO, but was weakly linked to it operationally. There were significant problems with the procurement processes, and for a full year the position of the staff member handling procurement was unfilled. Information management related to procurement was very weak for most of the project period. This was addressed towards the end of the project, when many reforms were brought about in the process (such as increasing transparency, greater communication etc.) A very good national ICR was prepared, with detailed information and good overall summary of the project's implementation.

7.7 Overall Borrower performance:

Moderately Satisfactory. Given the rating of moderately satisfactory in achieving the project's objectives, the relative strength of the borrower's contribution toward preparation and the good work undertaken within a number of the components during implementation, this ICR rates the borrower's performance overall as moderately satisfactory. The team draws attention, however, to the deficiencies in the Government's support to the effort noted above and the persistently poor performance of the secretariat prior to changes

at the end of the project's life.

8. Lessons Learned

LVEMP1 provided rich experience and lessons derived from successes and disappointments in implementation. Given the longer-term program for management of Lake Victoria, these lesson are particularly relevant.

As is fitting for a project supporting acquisition of knowledge, many of the lessons learned are technical in nature.

Among the most important that were not known at the outset of the project are the following:

- Biodiversity of fish has declined, but many species thought to be extinct in the watershed are in fact present in refugia in satellite lakes.
- A sustainable catch of Nile Perch is probably within the range of 220,000 tons annually (trawl surveys) to 350,000 tons annually (acoustic survey).
- Point sources of pollution are important locally and have effects on public health, but are not the largest sources of phosphorus and nitrogen exacerbating eutrophication of the lake.
- Eutrophication is primarily due to nitrogen and phosphorus from atmospheric deposition, although the relative contribution of the catchment to it is yet unknown.
- The lake level has varied significantly over time and is highly sensitive to small changes in the balance of inflows and outflows.
- Constructed wetlands can be effective measures to enhance the contribution that natural wetlands make toward water quality.
- Water hyacinth can be effectively contained in the lake through biological control (weevils), but weevils are less effective in the rivers that flow into the lake.

Interlinked national projects are vulnerable to failure of one of the partners, and must build in peer review and assistance, and safeguards in the event that these fail.

The inability to extend the IDA credit in Kenya was a serious problem for both of the other projects and for the regional effort overall. Partners should agree at the design phase to be mutually accountable for performance and mutually supportive when problems arise, so that they can be spotted and remedied early.

Scientific research must be targeted, provide usable information for management decisions, and be widely accessible.

Given the resource constraints and urgency of the need better to manage the lake, the monitoring and research undertaken should be targeted, applied, and framed with cognizance of the necessary and sufficient levels of information needed for management. The research should be managed efficiently, bringing in innovative mechanisms such as competitive grants, and subject to peer review for quality control. Outputs from monitoring and research should be widely shared.

Regional projects necessitate greater emphasis on clarity of project objectives, monitorable frameworks, at multiple levels, and adequate mechanisms for governance

Given weaknesses in capacity, clear objectives, indicators and targets help focus efforts towards results. Coordination and sharing of information are important, but real improvement in the state of the lake will require a mutually agreed set of standards linked to recognized indicators and enforced through agreed mechanisms including both incentives and sanctions. Establishment of such mechanisms is the core agenda of the second phase, drawing on knowledge created during the first and the initial experience with creation of institutions for governance.

The Basin perspective is critical to address the key environmental issues of Lake Victoria
The initial focus of the program was on the lake itself, particularly on fisheries. The key scientific results underscore the importance of interventions at the Basin level in order to address the problems of the lake. For instance, the important finding resulting from water quality monitoring indicates that atmospheric deposition accounts for the bulk of pollution in the lake (and part of the deposition may originate outside the basin). Similarly, some water hyacinth originates upstream from the riparian countries in Rwanda and Burundi.

Capacity Building has to address both current and projected gaps.
The project started with varying capacities among the three countries necessitating a careful strategy for need-based and gap-filling capacity building at all relevant institutions, not just the research bodies. Although the project upgraded skills and equipped institutions, it was less successful in projecting and filling future gaps. Moreover, long freezes in ability to hire within the countries exacerbated gaps in capacity. The timeline and intensity of capacity building has to be better managed to assure that needed personnel are available.

Implementation in the future can be undertaken through governmental structures.
The project relied on contracted staff and stand-alone PMUs for implementation. This was probably necessary at the time, but opened the door for insularity, some institutional jealousy regarding pay scales, and adverse incentives (e.g., high costs for workshops and travel allowances). Mainstreaming of implementation within governmental structures is now feasible and is a better approach for the future.

Environmental benefits must be strongly linked to improved livelihoods for local people and communities.
Community based micro-projects were highly successful and helped provide low-cost services on health, education, livelihoods related needs. They served as vehicles for raising awareness and capacity on sustainable land management, public health and sanitation, gender, and HIV/AIDS. The BMUs, CBOs, CIGs and other community institutions helped empower local people and led to an increase in economic opportunities. This approach was found useful in building community buy-in for activities generating positive environmental externalities pertinent to the lake's health. There is need for further attention to public health (sanitation and HIV/AIDS), access to micro-credit, and the socio-economic impacts of migration to the lakeshore.

Good education of the public and parliamentarians is critical for long term sustainability and success.
Proper management of Lake Victoria will require a long term commitment of public funds and willingness of people living in the basin to change behaviors. Attainment of both requires relentless and sophisticated investment in public education and communication.

Bank management should react quickly and strongly when environmental risks are identified, and elevate the issues early in the country dialogue. Bank management perceived the threat to the fishery as the environmental problem of most urgency even as that of the lake level was rising in priority. Sectoral and country management must be vigilant and aware that priorities can shift rapidly given the multiple risks inherent in the program. When the actual level of risk is difficult to assess, management should err on the side of overreaction in drawing attention of the partners to emerging issues.

9. Partner Comments

(a) Borrower/implementing agency:

Document Shared. Comments to be received.

(b) Cofinanciers:
Document Shared. Comments to be received.

(c) Other partners (NGOs/private sector):

10. Additional Information

Component Specific Details on Outputs, Institutional Development and Sustainability

Original Components as in the SAR

The joint SAR (June 1996) defined the following components (with the original total allocations, combined for the three countries, partly indicating the prioritization at the start of the project):

1) Fisheries Management (USD 2.28 million): The project supported the establishment of the Lake Victoria Fisheries Organization with facilities, assets, personnel and operational expenditures. The LVFO was expected to contribute to the improvement of fisheries management, conservation by collaborating with other lake related agencies, coordinating fisheries extension and disseminating information on Lake Victoria Fisheries.

2) Fisheries Research (USD 13.33 million): The program for fisheries research aimed to provide information on the ecology of the lake and its catchment, the biology of its flora and fauna, the impact of environmental factors on the lake system, and socioeconomic implications of use of the lake resources. The information was to contribute towards improved ecological efficiency, greater biodiversity, and ecological balance in the lake ecosystem. This component had *five* sub-components - a) Fish Biology and biodiversity conservation, b) Aquaculture, c) socioeconomic, d) database. Separately stock assessment was being conducted (financed by the EU). It was unclear why this was specified as a project sub-component and how this was to be coordinated with the remaining sub-components.

3) Fisheries Extension, Policies and Laws (USD 14.09 million): This component aimed at harmonizing legislation among the three countries, identifying and establishing closed fishing areas, strengthening enforcement capacity as well as supporting extension activities such as introducing new techniques, small scale aquaculture, strengthening information collection and promoting fishing community organizations. The component also aimed at supporting one fish quality control laboratory and micro-projects in selected fishing villages comprising of small investments in water supply, sanitation, access roads and health.

4) Fish Levy Trust (USD 2.03 million): This component aimed at studying and implementing a system for collecting levies from the fishing industry and using these funds in supporting fisheries and ecosystem management in the lake and its catchment.

5) Water Hyacinth Control (USD 8.31 million): The aim of this component was to establish sustainable long-term capacity for maintaining control of water hyacinth and other invasive weeds in the Lake Victoria.

6) Water Quality and Ecosystem Management (USD 9.6 million): The aim of the program was to elucidate the nature and dynamics of the lake ecosystem by providing detailed information on the characteristics of the waters of the lake. The program was to provide details of limnological changes, model and predict their short and long term consequences, and provide guidelines for ameliorating potentially disastrous changes. There was one core project, Management of Eutrophication, two pilots, Sedimentation and Hydraulic conditions and the Construction of a model of water circulation and quality in the lake, designed to help manage the problems.

7) Industrial and Municipal Waste Management (USD 9.89 million): The program aimed to improve

management of industrial and municipal effluent and assess the contribution of urban run-off to lake pollution in order to design alleviation measures. It consisted of one core project, Management of Industrial and Municipal Effluents, and two pilots, Integrated Tertiary Municipal Effluent Treatment and Integrated Industrial Effluent Treatment and a component for Priority Waste Management Investments.

8) Land Use and Wetland Management (USD 14.1 million): This component consisted of two core projects, Management of pollution loading (addressing non-point sources of pollution) and Buffering capacity of Wetlands as well as four pilots - Assessment of the role of agro-chemicals in pollution, integrated soil and water conservation, sustainable use of wetland products, and afforestation. These activities were a combination of information generation studies and piloting/implementation of solution on-the-ground.

9) Institutional Framework (Support to Riparian Universities and the Coordinating Secretariat) (USD 3.98 million): The last component lumped together two sub-components that targeted capacity building, ie Support to the Riparian Universities for strengthening facilities for environmental analysis and graduate teaching, and project implementation, i.e., Maintaining Coordinating Secretariats. One activity, the preparation of a Pollution Disaster Contingency Plan was also included.

It is noted that Fisheries Extension (Component No. 3) included an allocation of USD 3 million towards micro-projects in fishing communities. Community Participation was a crosscutting issue from the beginning. These components combine for a total external financing of USD 25.3 million and total project costs of USD 28 million for Uganda.

Revised Components

The final list of components and sub-components in Uganda as prevalent at the end of the project, with major changes indicated, is below:

No.	Component *Implementing Agency*	Sub-Components
1	**Fisheries Management** *Department of Fisheries Resources, Ministry of Agriculture, Animal Industry and Fisheries*	a) Aquaculture and Extension
		b) Fish Quality Assurance
		c) Legislation and Co-Management (Sub-component originally focused on extension and enforcement)
		d) Fish Levy Trust (originally a component, was incorporated as a sub-component)
		e) Fisheries Statistics
		f) Micro-projects (originally not a distinct sub-component, although funds were allocated)
		g) LVFO establishment[1]
2	**Fisheries Research** *Fisheries Resources Research Institute-FIRRI, National Agricultural Research Organisation-NARO*	a) Fish Biology and Biodiversity Conservation
		b) Aquaculture Research
		c) Socioeconomic Research
		d) Information and Database Management
		e) Water Hyacinth Research[2]
3	**Water Hyacinth Control** *Department of Fisheries Resources, Ministry of Agriculture, Animal Industry and Fisheries*	
4	**Water Quality and Ecosystem Management** *Water Resources Management Department, Ministry of Water,*	a) Management of Eutrophication

		b) Sedimentation Pilot Study
		c) Hydraulic Condition Pilot Study (databases and water modelling)
		d) Water Quantification (hydrology, water balance of Lake Victoria)
5	**Industrial and Municipal Waste Management** *National Water and Sewerage Corporation - NWSC*	a) Management of Industrial and Municipal Waste
		b) Integrated Tertiary Industrial Effluent Treatment Pilot Project
		c) Integrated Tertiary Municipal Effluent Treatment Pilot Project
		d) Priority Waste Management Investments
6	**Wetlands Management** *Wetland Inspection Division, Ministry of Water, Lands and Environment*	a) Buffering Capacity of Wetlands
		b) Sustainable Use of Wetland Products
7	**Land Use Management** *Kawanda Agricultural Research Institute* (The core and pilot projects of the Land Use and Wetland Component were merged to form this component))	a) Management of Pollution Loading
		b) Agro-chemicals Management
		c) Integrated Soil and Water Conservation Pilot Project
8	**Catchment Afforestation** *Forestry Department, Ministry of Water, Lands and Environment*	(This was originally a pilot of the Land Use and Wetland Component, and became a full-fledged component)
9	**Capacity Building/Support to Riparian Universities** *Department of Zoology, Makerere University*	(This was originally a sub-component of the Institutional Framework Component, and became a full-fledged component)
12	**Coordinating National Secretariat** *Ministry of Water, Lands and Environment*	Project management and coordination (This was originally a sub-component of the Institutional Framework Component)

[1] This was originally a component, later became a subcomponent for the Uganda Fisheries Management component.

[2] Only in Uganda, Water Hyacinth related research was separated from management and included as a sub-component under Fisheries Research.

Components Objectives and Outputs

Fisheries Management

Objective: To improve overall management and protection of fisheries resources in Lake Victoria by strengthening both national and regional institutional framework and promotion of conservation measures.

This component, implemented by the Fisheries Resources Department, had 7 sub-components and focused on co-management of resources, extension and enforcement of regulations. In total, 51 BMUs were established through LVEMP support, the majority coming on-board in the last year. It is unclear

why there was such a slow movement in establishing BMUs between 1999-2005 by LVEMP, while about 300 BMUs were supported by EU and DFID in a shorter period. The BMUs still require substantial capacity strengthening. The component contributed to the new fisheries Bill (not enacted) that recognizes these BMUs as legal entities with a wide ranging role in fisheries management and to the harmonization of legislation across the three riparian countries. Monitoring and enforcement was also strengthened (the quantity of immature fish seized declined by 88 percent over the period 2002-05). Three frame surveys were conducted (2000, 2002 and 2004). The component helped introduce new fishing techniques and supported aquaculture (establishing 40 hatcheries of which 14 were demonstration hatcheries, leading to an average annual production of 1.8 million fingerlings by about 3000 farmers); provided extension and training on a wide range of issues to fishermen and local fisheries staff (covering 14 districts) and established a fish quality assurance laboratory (which is presently able to undertake micro-biology analysis and is awaiting accreditation for a wide range of functions; staff need both training and transport.). Fish inspection capacity has been strengthened with 12 new central and 45 local inspectors and training. The project helped in the lifting of the EU ban thereby preventing losses in fish exports. The component attempted to set up a harmonized fish levy trust (FLT) as a mechanism for sustaining fisheries management expenditures over time. The FLT has been embodied in the Fisheries Bill, however it has not been operationalized, with some differences between the countries on the level of fish levies (Uganda has agreed in principle to a 2 percent levy, like in Kenya, compared to 6 percent in Tanzania.)

Fisheries Research

Objective: To improve overall management and protection of fisheries resources in Lake Victoria by strengthening both national and regional institutional framework and promotion of conservation measures.

The fisheries research component had five sub-components that focused on research of fish biology and biodiversity conservation, aquaculture, socioeconomic, water hyacinth and a supporting activity on information management. Information collected was marshaled into a national synthesis report. It supported the preparation of several outputs including a comprehensive bibliography, an atlas and two regional unpublished compendia. Threatened species were identified and stocks collected from satellite lakes, while 3-4 species cultured (of which one is new), fish feeds for three fish species initiated and aquaculture related articles, draft books, two booklets/manual, information media (video) were prepared. 8 of 14 socioeconomic studies were prepared but not published or yet shared. There was a strong effort towards information management (on-site library) and limited dissemination through outreach (guided tours, brochure, and use of audio, video media). The information generated is not yet available on a project website accessible to a broad audience. Capacity was enhanced in FIRRI - staff training to advanced degrees (7 Ph.D.'s and one M.Sc.) as well as 65 short courses were supported by the project.

Water Quality and Ecosystem Management Component

*Objective: To elucidate the nature and dynamics of the lake ecosystem (and establish a water quality and quantity monitoring network throughout the catchment).*The part in brackets has been taken on-board the project during implementation and reflects one of the main activities under this component. The following outputs have largely been delivered, in addition to staff training at various levels:

a) Management of Eutrophication (Eutrophication Studies): A network of monitoring points and 19 stations were identified (GPS-positioned); an average of 500 annual water quality profiles in the lake were established through 25 lake cruises; collected data on 15-20 nutrient and biota parameters. The baseline is not conclusively established due to gaps in data. The laboratory was established before LVEMP (supported by GoU and DANIDA), but operations were substantially supported by LVEMP

(now ISO-certified), as it had little capacity. The data of point and non-point pollution sources in the catchment and on the lake shore are collected by other components. The planned lake production study and the study of disease prevalence along the shore were not undertaken.
b) Sedimentation Pilot Study: Collection of data was insufficient for conclusive analysis. Preliminary conclusions indicate that the sedimentation rate in the lake is low, at 0.5-1 mm per year, and comparable to the findings in Winam Gulf, Kenya. The study is not completed and no trends have been established. The inorganic sedimentation data have not yet been analyzed.
c) Hydraulic Condition Pilot Study (databases and water modelling): Data was generated, but training on the (MINTAB) software did not materialize.
d) Introductory training to the Lake Victoria Water Quality Model (hydrodynamic module) was given in Delft University/IHE (The Netherlands) and in Uganda. Gaps in the data series and the additional training must be addressed before the model can be applied.
e) Water Quantification (hydrology, water balance of Lake Victoria): This issue became important during the project implementation because of the rapidly falling lake level. A "Water Balance Model for Lake Victoria" was established, data analyzed and water balance of the lake was estimated.

Water Hyacinth Control
Objective: To establish sustainable long-term capacity for maintaining control of water hyacinth and other invasive weeds in the Lake Victoria. The component has been able to decrease the cumulative areas infected by Water Hyacinth by approximately 4500 hectare by December 2005. Through an integrated control strategy comprising mechanical, biological, manual and chemical, the abundance of water hyacinth in the lake has been reduced to biologically sustainable and non-nuisance levels for the operations on the lake and for the surrounding communities. The chemical control method tested by NEMA and research institutes was deferred after MTR, following EIA recommendations. Nevertheless, with mechanical, biological and manual control methods output targets for the component have been successfully met. With regard to biological control using weevils, 20 weevil rearing units have been established out of which 15 are functioning today. With the exception of the few nonfunctional rearing units, which were established too far from the lake, the survival of 75 % of the originally implemented rearing stations is a good success rate. An assessment has been done enabling the component to target hotspots and map areas that experience renewed infestation. Even though these hotspots to some extent seem obvious, the maps have increased the ability to operate efficiently. As of December 2005 a cumulative total of 502 million of weevils have been released in Lake Victoria targeting Kagera River, which is one of the main sources of new Water Hyacinths to Lake Victoria. The weevils have, however, not been successfully established in the Kagera River (and in river systems in general), and hence other methods are being tested for riverine hyacinth.

Wetlands Management
Objective: To increase knowledge of wetlands buffering processes and of Lake Victoria wetlands; to determine economic potential of the Lake Victoria Basin wetlands products; to demonstrate wise use of wetland resources; and to develop strategies for wetlands management.
The main outputs are as listed: extensive inventory on wetlands and national wetlands map produced; wetlands ability to clean wastewater characterized (demos at Kirinya, Kinawataka and Kisoma wetlands); contribution of LVEMP supported research to the Wetland Sector Strategic Plan; cost benefit analysis of wetland products and other aspects of wetlands carried out in Sango Bay, Busia and Kampala. Furthermore a number of capacity building activities have been undertaken: One fully operational community based crafts center established, one initiated but not operational.

The functionality of wetlands as buffers has been established and presented. In the process of increasing the local knowledge on sustainable use of wetlands more than 200 communities were trained

in improvement of the crafts quality, fish farming and propagation and cultivation of economical important wetland plants. In addition to the face-to-face interactions a number of radio spots and programs were broadcast. Out of the 200 communities 7 were selected as demonstration sites. In two of these craft centers have been built through the micro project scheme, and one is operational at present.

Soil and Water Conservation

Objective: To quantify soil erosion and nutrient loss from different land covers and uses, design remedial measure and sustainable agricultural practices, develop systems to promote soil and water conservation, and establish demonstration units to disseminate successful soil and water conservation measures.

Outputs included soil erosion hazard map for the Lake Victoria catchment in Uganda, a database and land resource inventory at Kawanda Agricultural Research Institute (KARI), detailed land cover maps for two districts and 4 other land/soil maps as well as a monitoring network of pollution loads (loads established in selected micro-catchments). Additionally, the constraints for poor adoption of SLM practices were studied and identified, average annual soil loss was estimated, 26 soil and water conservation demonstration plots were established, village level Soil and Water Conservation committees were established and 53 micro-projects were completed. The lessons learned report provides a very good summary of the key challenges and opportunities in moving beyond the first phase as well as identifying various policy issues that need to be addressed. Finally, while data on wet and dry atmospheric deposition (a critical issue for the Lake) were continuously gathered, only partial analysis was completed and published (1999-2001). A comprehensive agro-chemicals inventory in Lake Victoria catchment was completed and awareness was raised among stockists and end users.

Catchment Afforestation

Objective: To protect vital areas of Lake Victoria catchment by planting trees by involving local communities and institutions.

In the period 1998-2004, about 5.7 million tree seedlings, of which 4.6 million seedlings were distributed to the communities with a 60 percent survival rate among the distributed seedlings (or 48% of the total produced). The cumulative area planted with trees totaled 2000 ha by 2005. At project close, 25 of the initial community managed tree nurseries remained operational.

Capacity Building - Support to Makerere University, Department of Zoology

Objective: To strengthen facilities for environmental analysis and graduate teaching. Graduates include 90 bachelor students, 7 PhDs (2 university and 5 component staff) and 5 masters (component staff). About 38 short courses were conducted. The department developed and offered a new degree course (Bachelor of Science in Fisheries and Aquaculture) which has attracted many students. The department also conducted information dissemination and sensitization through media campaigns, targeting prospective students and end-users.

Institutional Framework - National Secretariat

Objective: Responsible for overall monitoring and reporting progress, coordination and information sharing

The Secretariat included the National Executive Secretary, Operations office, Procurement officer, Accountant, and an Information Management Officer and various assistants. The secretariat coordinated the activities of the project.

Micro-projects and Community Participation

117 projects were implemented. The project supported the activities with the major part of the funding,

with in-kind contributions of around 10 percent by communities.

Institutional Development

Fisheries Management. Development of the fisheries bill that highlights the shift to co-management of the resource through the establishment of BMUs; fish quality assurance that is underpinning exports, stronger monitoring and enforcement capacity as well as a strong information base, all contribute to a stronger institutional response.
Fisheries Research. The considerable amount of information remains with the institution (FIRRI), which was also enhanced with support for capacity. Many staff completed advanced degree courses and while others received training on a wide variety of issues.
Water Quality and Ecosystem Management Component. The component has to some degree increased the knowledge and capability of the component staff (in the Water Resources Management Department, Directorate of Water Development, Ministry of Water, Lands and Environment) regarding eutrophication and water quality characteristics in the lake and establishment and running of monitoring networks (in the lake). There is, however, still a lack of resources (time and staff) to analyze all the data collected, and to undertake sophisticated laboratory analyses. This has been a bottleneck throughout the project. Following a calibration round with other laboratories, the quality of the laboratory work is now satisfactory. The depth of analysis in the synthesis report has been found weak.
Industrial and Municipal waste management. The component has just to a minor degree increased the knowledge of the component staff (National Water and Sewerage Corporation and Institute of Environment & Natural Resources, Makerere University) regarding wastewater management, where relatively good knowledge already existed before the project came onboard. Some new knowledge of the spreading and dilution of pollutants in the Inner Murchison Bay has been acquired, but the practical application of such knowledge is not yet seen. Marginal new knowledge on wetland treatment of wastewater has been documented. The project, notably contributed to improving the wastewater treatment plant operations (improvement of the infrastructure facilities and working environment for workers) somewhat improving the quality of effluent contribution of this source.
Water Hyacinth control. The Component activities have been substantially mainstreamed into the Fisheries Department, which has also had close collaboration with other relevant government institutions such as NEMA. This approach ensures that the capacity built and the lessons learned will be utilized to increase the department's ability to cope with future water hyacinth infestation.
Wetlands management**.** The project enhanced institutional capacity within the national agency considerably which is still present after the project has ended. Both contracted and permanent staff has gained increased insight and do to some extent know how to apply the knowledge into management decisions. It is believed that the institutional development is at a stage where it can be self supportive and evolving.
Soil and Water Conservation. The component supported significant strengthening of capacity at KARI, among the communities and district officials. Three staff trained at the doctoral level, five at masters' level, twelve field extension staff received in-service training. The component also provided equipment and facilities for research. The resulting outputs help put in place a framework for a land management program and the considerable information gathered towards improved land use and lower pollution loading contribute towards the development of future activities.
Catchment Afforestation. The component carried out formal training for a number of the permanent staff of the ministry. An M.Sc. Degree has been obtained and staff attended 2 short courses. According to the assistant commissioner for forestry the component activities were carried out as additional work of the ministry and were not really embedded in the mainline program. Activities were therefore seen as extraneous and implementation suffered as it was felt that there were few economic

incentives to staff doing the assignments. The knowledge gained throughout the project is still within the ministry, which increases the institutional development of the component.
Capacity building in the Riparian Universities. There is undoubtedly more capacity developed in the field of aquatic sciences in the country. Further, the strengthening of the department facilities have contributed in improving the quality of academic programs offered at the University.
National Secretariat. The secretariat has not had the expected level on impact in developing strong and lasting collaborative links between implementing agencies that could have led to greater coordination and jointly planned arrangements.
Microprojects and community participation. These activities helped increase buy-in among the communities, raise awareness on the critical environmental issues and help empower communities. The approach was found to be very successful and microprojects were in high-demand.

Sustainability

Fisheries Management. Capacity building at various levels and the strong shift to co-management contribute to the sustainability of the outputs of this component. This is reflected in the Fisheries Bill. Nevertheless, some concerns remain. The approach towards fisheries management was to target fishing effort through a variety of methods, rather than directly curtailing it through regulation. This requires a strong management effort that cannot be sustained without the resources expected through the fish levy trust, which is not yet operational. A related issue is that of the excess processing capacity which is driving the fishing effort.
Fisheries Research. The sustainability of the research activity depends on additional funding. Post-project, it was evident that outputs such as the biodiversity compendia, atlas and other outputs cannot be finalized and/or published unless additional support is provided.
Water Quality and Ecosystem Management. The monitoring of water quality in the lake will depend on continued funding. Additional data (hopefully key ones) will most likely be collected in the Bridging Phase with the limited funds available. There has been an increase in capacity in the institution, which will remain and it is expected that there will continue to be contributions to the national lake level dialogue and policy.
Industrial and Municipal Waste Management. Governmental funds have not yet been pledged for continued monitoring of water quality in Inner Murchison Bay and operations of the tertiary municipal treatment demonstration plant in Jinja and the tertiary industrial treatment pilot plant. The tertiary treatment infrastructures will require regular maintenance to keep the distribution pipes and the transects clear, and commitment to maintenance measures is not yet certain. Nor is it clear that measures will be taken to retain the wetland plant in Jinja as a demonstration plant or to monitor the long-term effects of the treatment. The operation of the refurbished Bugolobi WWTP will continue, but the half-built retention wall will require additional resources for completion.
Water Hyacinth Control. Based on the high survival rate of the weevil rearing units and participation of the communities through BMU approach, it is most likely that operations will continue. Continued and secure financing for the rearing units will be required.
Wetlands management. The component is fully embedded in the ministry and all component activities have been mainstreamed. Continuity of the community-based activities is less clear.
Catchment Afforestation. Since 2003 there have been a substantial decline in the production and planting of seedlings, as LVEMP stopped buying seedlings from the farmers at high rates. Prices for seedlings dropped from 100 USh – 150 USh to between 25 sh – 30 Sh which is what the local market is able to pay for the seedlings. The component has been able to raise awareness about the importance of trees, and increased awareness has been reflected in growth in demand for seedlings. The economic viability of small-scale production of seedlings for the local market, however, is not yet certain and may need continued development.

Land Use Management. The use of a strategic and targeted approach towards soil and water conservation with the effort to identify and address the constraints to adoption of SLM practices appears to be strongly indicating sustainability. This was also a key component that developed an exit strategy by decentralizing activities to the district. Furthermore, there is considerable information and very good lessons from the experience (summarized in the lessons learned report) that contribute towards scaling up and/or targeting other areas.

Capacity Building: Support to Riparian Universities. The laboratory operations and level of student graduations is linked to the funding and is likely to slow down considerably post-project. While the undergraduate degree course offering will continue, the department acknowledged that the intensity of field work and quality of masters' research would suffer without continued funding.

Institutional Framework: National Secretariat. The LVEMP secretariat continues to operate during the bridging phase, but is leaner, in terms of staff and resources, and is led by a new project coordinator. The contracts of the National Secretary and Operations Officer have ended. The secretariat is not intended to be sustained in the second phase, since alternative implementation arrangements will be put in place.

Microprojects and community participation. Microprojects were largely demand-driven and were oriented to meet self-identified needs. Collaboration with mainline agencies in service-provision also strengthened the likelihood of sustainability.

Annex 1. Key Performance Indicators/Log Frame Matrix

These indicators are formulated in Annex 4 of the **Staff Appraisal Document (1996)**. The indicators were not quantified and tracked systematically. Component specific outputs and achievements have been detailed in Section 10 of the ICR.

Indicators	Achievements at project completion	Comments
1. Building capacity within the riparian universities, the line ministries, LVEMP secretariats and the riparian communities for environmental analysis, conservation and adoption of cohesive management practices on the lake.	University and implementing agencies strengthened; Members of staff trained at various levels (eg. 3 PhDs and 25 M.Sc,); New Faculty of Aquatic Sciences and Technology established; Two new degree programs for undergraduates developed and delivered; Increased student enrollment increased from a maximum of 15 students per year prior to 2002 to 50 students per year post 2002. Numerous others were trained on-the-job and through short courses.	Substantial capacity building activities undertaken, in implementing agencies, the secretariat, and at the local Government and community levels. Better trained personnel contributed toward stronger institutions. A capacity building strategy was not developed and efforts were linked to needs identified by the agencies themselves. There was a greater emphasis on fisheries related capacity than in other areas.
2. Harmonization among the three countries legislation addressing management of fisheries and environment variables important in the lake basin, and improved enforcement of this legislation.	Fisheries regulatory and policy frameworks strengthened and harmonized across three countries; Contributed to major sector policies (fisheries, wetlands) and related regulations; Lake Victoria Fisheries Organization created; Contributed to formulation of the Lake Victoria Protocol and subsequent Lake Victoria Basin Commission, under the EAC leadership.	Enforcement of the fisheries legislation has started in all countries. The LVFO will play a crucial role in the implementation and enforcement of the legislations in the fisheries sector. Agreement on the critical issue of establishing a sustainable catch and limiting the joint harvest to that level is not yet attained. The environmental standards especially concerning wastewater discharges and pollution/water quality have not been standardised, and were given little attention in the project. The “polluter-pays” principle has not yet been accepted across the region, and enforcement is weak.
3. Establishment of the Lake Victoria Fisheries Organization (LVFO)	Achieved	LVFO active and coordinating regional activities. Focus on establishment of Beach Management Units and post-harvest fish quality issues, and to a lesser measure on stock assessments.

4. Completion of gazetting and regulating fish landing sites within pilot zone areas and enforcing acceptable fishing practices within a 5 km radius of fishing villages within these areas, with full participation of lakeshore fishing communities.	Gazetting of landing areas largely undertaken. Co-management through 51active Beach Management Units (BMUs) progressing. Illegal fishing reduced in all countries.	BMUs units most advanced in Tanzania under LVEMP. The process of establishing BMUs has largely been taken over by LVFO.
5. Establishing sustainable long-term capacity for management and control of water hyacinth and other invasive weeds in Lake Victoria Basin, through integrated weed control methods and community involvement	Biologically sustainable control of water hyacinth achieved (85% reduction); Strong community involvement in control activities.	Different locations for the weevil rearing stations were used, including schools, fishing villages etc., based on the preferences of the local communities.
6. Establishing a lake wide water quality and rainfall monitoring system with agreed parameters to generate information on eutrophication management and pollution control.	Network of monitoring spots in the lake and rivers determined in all 3 countries. The sampling throughout the project has been intermittent rather than regular. Weather station measuring dry and wet deposition established and followed up.	A substantial baseline information was established. Key scientific results were generated. Emphasis was on data collection. Sampling was episodic, affected by flow of funds problems; capacity sometimes was overwhelmed.
7. Completing a full inventory and resource survey of Lake Victoria wetlands, and preparing investment proposals for the economic management of these wetlands, including their rehabilitation.	Completed. Maps and wetland inventory available in all countries. and classification of Lake Victoria wetlands; maps produced	More comprehensive wetland management plans were developed for a few pilot areas, using a participatory approach.

Annex 2. Project Costs and Financing

Table 1: Financing Plan for LVEMP Regional Project (three countries) at Appraisal

Project Component	Govts.	GEF	IDA	Total	Percent
LVFO	0.20	2.10		**2.30**	3
Fisheries Management	1.40		12.70	**14.10**	18
Fisheries Research	1.30	8.80	3.20	**13.30**	17
Water Quality Management	1.00	8.60		**9.60**	12
Industrial and Municipal Waste Management	1.00		8.90	**9.90**	13
Water Hyacinth Control	0.80	4.50	3.00	**8.30**	11
Land Use, Catchment Afforestation and Wetlands Management	1.40	7.40	5.30	**14.10**	18
Support to Riparian Universities + National Secretariat	0.60	3.60	1.90	**6.10**	8
Total	**7.70**	**35.00**	**35.00**	**77.70**	**100**

Table2: LVEMP Uganda - Appraised Project Costs and Financing Sources by Component (USD '000)

Component	IDA	GEF	IDA+GEF	GOU	Total
LVFO		2,055.90	2,055.90	228.40	**2,284.30**
Fisheries Management	5,501.80	-	5,501.80	611.30	**6,113.10**
Fisheries Research	1,143.50	3,078.20	4,221.70	469.10	**4,690.80**
Water Quality Monitoring		2,734.20	2,734.20	303.80	**3,038.00**
Industrial &municipal waste	2,654.90		2,654.90	317.20	**2,972.10**
Water Hyacinth	1,141.80	1,712.70	2,854.50	317.20	**3,171.70**
Wetlands management	215.80	1,247.10	1,462.90	162.50	**1,625.40**
Land Use management	595.20	1,223.00	1,818.20	202.00	**2,020.20**
Catchment afforestation	838.60		838.60	93.20	**931.80**
Support To MUK Zoology Dept		319.00	319.00	35.40	**354.40**
National Secretariat		766.10	766.10	85.10	**851.20**
Total	**12,091.60**	**13,136.20**	**25,227.80**	**2,825.20**	**28,053.00**

Table 3a: LVEMP Uganda IDA Credit - By Expenditure/Disbursement Category

in USD '000	IDA			IDA Supplemental		
Category	**Allocated**	**Disbursed**	**Undisbursed**	**Allocated**	**Disbursed**	**Undisbursed**
Civil works	758.67	719.40	39.27	157.05	101.83	55.22
Vehicles and Equipment	2868.00	3025.92	-157.92	529.02	473.59	55.43
Consultant Services and Training	3911.59	4453.18	-541.59	2214.11	2038.58	175.52
Goods, Works, Services	653.90	484.10	169.80	101.55	67.08	34.47
Operating Costs	4206.80	3708.33	498.47	2312.12	1901.79	410.32
Unallocated	0.00	0.00	0.00	0.00	0.00	0.00
Special Account	0.00	7.37	-7.37	0.00	195.70	-195.70
Totals	**12398.96**	**12398.30**	**0.66**	**5313.85**	**4778.57**	**535.28**

Table 3b: LVEMP Uganda GEF Grant - By Expenditure/Disbursement Category

in USD '000	GEF		
Category	**Allocated**	**Disbursed**	**Undisbursed**
Civil works	270.00	260.12	9.88
Vehicles and Equipment	3398.00	3305.50	92.50
Consultant Services and Training	6446.00	6533.06	-87.06
Goods, Works, Services	0.00	0.00	0.00
Operating Costs	3083.00	3062.40	20.60
Unallocated	0.00	0.00	0.00
Special Account	0.00	17.41	-17.41
Totals	**13197.00**	**13178.49**	**18.51**

Table4: LVEMP Uganda - By Component and Financing Sources (USD '000)

Component	**IDA**	**GEF**	**IDA+GEF**	**GOU**	**Total**
LVFO		1,906.03	1,906.03		**1,906.03**
Fisheries Management	4,454.60	244.86	4,699.50	318.85	**5,018.35**
Fisheries Research	2,250.58	2,306.30	4,556.81	309.19	**4,866.00**
Water Quality Monitoring	789.97	2,257.57	3,047.51	206.78	**3,254.29**
Industrial &municipal waste	2,271.91	472.76	2,744.67	186.24	**2,930.91**
Water Hyacinth	1,479.00	876.80	2,355.80	159.83	**2,515.63**
Wetlands management	921.14	925.74	1,846.81	125.33	**1,972.14**
Land Use management	884.59	603.52	1,488.14	100.96	**1,589.10**
Catchment afforestation	680.02	143.00	823.02	55.84	**878.86**
Support To MUK Zoology Dept	275.40	367.50	642.90	43.62	**686.52**
National Secretariat	1,234.07	3,014.41	4,248.50	288.26	**4,536.76**
Total	**15,241.28**	**13,118.49**	**28,359.96**	**1,794.91**	**30,154.60**

Annex 3. Economic Costs and Benefits

A standard ERR was not estimated in the SAR, as is often the case for projects with a primary emphasis on capacity strengthening and institutional reform. The lack of economic data from monitoring and evaluation of various project activities makes *ex post* estimation of an ERR difficult, should it be deemed desirable. The section below provides indicative socio-economic data and a discussion of quantitative results achieved compared to the potential benefits highlighted in the SAR.

Among the gross benefits expected in the SAR are avoided losses related to decline in fishery as a result of over-fishing and deterioration in water quality, impacts of water hyacinth infestation, poor quality of water supply for domestic and animal uses, and continued degradation of wetlands.

Economic Importance of the Resource:
The Lake Basin economy is driven by Agriculture and Fisheries (70 percent), including a number of cash crops (including fish exports) and a high level of subsistence fishing and agriculture. It produces in the order of USD 5 billion annually (2000-04), increasing from the estimated USD 3-4 billion, in 1996. Population in the Lake Basin, in that time, has gone up from 25 million to an estimated 30 million people, of whom 3 million depend directly or indirectly on fish and fisheries. General standards of living are between USD 90-270 per capita per annum (based on national figures). It is estimated that fisheries contribute about 3 percent to the riparian economies. The quality of the environment and the status of the natural resources are therefore critical factors in the maintenance and growth of incomes, livelihoods and poverty alleviation opportunities in these countries.

Fisheries Sector
Fish production for the whole lake is currently estimated to be between 400,000 to 600,000 metric tons worth USD 400 to 600 millions annually. It is estimated that a majority of this production is artisanal fishery. In Uganda, 200,000 metric tons of fish are landed at 554 sites (2004). An estimated 1 million people are involved in the different fishery activities, from production, processing, marketing to other related activities. Currently exports of fish from the entire lake are estimated at USD 270 million. The Nile perch products are exported to Europe, Australia, Asia, Africa and America.

Benefits from Export-related Improvements in Fish Quality Assurance
There was a decline in values from exports due to the import bans imposed by European markets, in 1999 and 2000 because of phytosanitary concerns. The main effect of he ban was to divert exports to markets with lower prices. Measures by the project to strengthen quality assurance helped remove the bans. The table in the appendix shows the decline in quantities exported, and the prices received. A rough estimation of avoided losses in the period 2000-2004 (see table 1 below) is around USD **28 million,** while the cost of the quality assurance subcomponent was USD 0.7 million and the overall Fisheries Management component was USD 4.7 million.

Benefits from Wetlands and Sustainable Land Management
A cost benefit analysis was conducted to value the various benefits and services, including use values (materials etc.), other uses such as agriculture, livestock, fishing, and environmental services and option values, gained from wetlands, which was estimated at **USD 56 million** per annum. The study developed three scenarios with increasing levels of management interventions and estimated their costs at USD 3.9 million, USD 6.3 million and USD 30 million per year.

The cost-benefit analysis for wetlands valued the benefits of tertiary treatment by the natural Nakivubo wetland through which the partially treated sewage from Kampala's treatment plant (Bugolobi) and storm

water flow before entering the Lake, to about **USD 1.7 million** per annum.

The Lessons learned report for Land Use Management provides a good analysis of land degradation and the impacts of land use measures on productivity and environmental services. It estimates that USD 9.6 million is lost each year due to soil erosion.

Benefits of Water Hyacinth Control

The SAR estimated that the wide-range of direct costs on the lake community as a result of the spread of water hyacinth, including those arising from transportation (delays in transport, increased operation costs, loss in fishing time, increased difficulty collecting water, blockage of intakes and loss of production at urban and industrial water supply systems, to about USD 6-10 million per annum. The Water Hyacinth infestation has been reduced to non-nuisance levels. Indicative avoided costs range to more than **25-40 million** in the period 2000-2005 for the whole Lake**.**

Table 1: Estimation of Avoided Losses due to EU Fish Ban

Years	**Quantities Tonnes**	***Prices ($) per tonne***	***Values US$***	***Prices (No EU ban case)***	***Values (no EU ban case)***
1997	9,839	2,927	28,798,753	2,927	28,798,753
1998	13,805	2,530	34,927,283	2,530	34,927,283
1999	13,380	2,736	36,607,625	2,736	36,607,625
2000	15,876	2,164	34,356,486	2,164	34,356,486
2001	28,672	2,804	80,396,765	*2,207*	63,287,507
2002	25,169	3,479	87,563,438	*2,860*	71,985,754
2003	25,111	3,479	87,359,777	*3,549*	89,106,973
2004	29,831	3,439	102,588,534	*3,549*	105,857,406
Total	**161,683**		**492,598,661**		**464,927,787**
Difference	**-27,670,874**				

Annex 4. Bank Inputs

(a) Missions:

Stage of Project Cycle	No. of Persons and Specialty (e.g. 2 Economists, 1 FMS, etc.)		Performance Rating	
Month/Year	Count	Specialty	Implementation Progress	Development Objective
Identification/Preparation				
10/21/1992	*1*	1 TASK TEAM LEADER		
3/1/1993	*2*	1 TASK TEAM LEADER, 1 INSTITUTIONAL DEVELOPMENTN OFFICER		
4/27/1994	*2*	1TASK TEAM LEADER, 1INSTITUTIONAL DEVELOPMENT OFFICER		
6/14/1994	*2*	1 TASKK TEAM LEADER, 1 INSTUTIONAL DEVELOPMENT OFFICER		
7/29/1994	*2*	1 TASK TEAM LEADER, 1 INSTUTIONAL DEVELOPMENT OFFICER		
10/9/1994	*2*	1 TASK TEAM LEADER, 1 INSTUTIONAL DEVELOPMENT OFFICER		
2/11/1995	*2*	1 TASK TEAM LEADER, 1 INSTITUTIONAL DEVELOPMENT OFFICER		
5/26/1995	*2*	1 TASK TEAM LEADER, 1INSTUTIONAL DEVELOPMENT OFFICER		
Appraisal/Negotiation				
12/1-22/1995				
5/20-22/1996				
Supervision				
11/15/1997	*10*	TASK TEAM LEADER (1); PROCUREMENT (1); PARTICIPATION (1); WATER SANITATION (1); COMMUNICATION (1); ANTHROPOLOGY (2); MONITORING (1); INFO. TECH. ANALYST (1); NATURAL RESOURCE MGMT. (1)	S	S
05/15/1998	*5*	TASK TEAM LEADER (1); CO-LEADER (1); PARTICIPATION (1); LIMNOLOGY (1); ANTHROPOLOGY (1)	S	S
05/7/1999	*5*	TASK TEAM LEADER (1), WATER HYACINTHS AND		

			WETLAND(1), MICROPROJECTS AND COMMUNITY PARTICIPATION (2), CONSULTANT (1)		
	03/15/2000	*9*	TASK TEAM LEADER (1); WATER HYACINTH/WETLAND (1); MICRO PROJ/COMM. PARTI (1); FINANCIAL ANALYST (1); NGO/MICRO PROJ/COMM PA (1); WATER QUALITY/LIMNOLOG (1); CATCHMENT (1); REG. EXEC.SEC/LVEMP,TZ (1); PROJ. MGR. LAKE MALAWI (1)	S	S
	6/10/2002	*7*	TASK TEAM LEADER (1), BANK STAFF (4), CONSULTANTS 2		
	05/16/2003	*5*	TASK MANAGER (1); FINANCIAL MANAGEMENT (1); PROCUREMENT (1); CONSULTANT (2)	S	S
	10/11/2004	*8*	WATER QUALITY, HYACINT (1); MICROPROJECTS, WETLAND (1); LAND MANAGEMENT, AFFOR (1); INDUSTRIAL/MUNICAL WAS (1); FINANCIAL MANAGEMENT (1); PROCUREMENT (1); FISHERIES (1); CAPACITY BUILDING (1)	U	S
	4/26/2004	*7*	TASK TEAM LEADER (1), CO-TASK TEAM LEADER (1), LEAD SPECIALIST (1), FINANCIAL MANAGEMENT SPECIALIST (1), PROCUREMENT SPECIALIST (1), PROGRAM ASSISTANT (1) CONSULTANT (1)	S	S
	4/11/2005	*9*	TASK TEAM LEADER (1), SR. SECTOR ECONOMIST (1), SR. SOCIAL DEVELOMENT SPECIALIST (1), RURAL DEVELOPMENT SPECIALIST (1), FINANCIAL MANAGEMENT SPECIALIST, PROCUREMENT SPECIALIST (1), CONSULTANTS (3)		
ICR					

April 24, 2006	*3*	TASK TEAM LEADER/ENVIRONMENTAL ECONOMIST (1), ENVIRONMENTAL SPECIALIST/INDEPENDENT CONSULTANT (1), GEF SPECIALIST/OBSERVER (1)	S	S

(b) Staff:

Stage of Project Cycle	Actual/Latest Estimate	
	No. Staff weeks	US$ ('000)
Identification/Preparation	n.a.	91*
Appraisal/Negotiation	n.a.	*
Supervision	39**	779
ICR	15	70
Total	n.a.	940

Notes:
* Total amount for Identification/Preparation and Appraisal/Negotiation
** Partial data for the years FY01-05
Amounts include BB and GEFBB funds

Annex 5. Ratings for Achievement of Objectives/Outputs of Components

(H=High, SU=Substantial, M=Modest, N=Negligible, NA=Not Applicable)

	Rating
☐ *Macro policies*	○ *H* ○ *SU* ○ *M* ○ *N* ● *NA*
☒ *Sector Policies*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☒ *Physical*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☒ *Financial*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☒ *Institutional Development*	○ *H* ● *SU* ○ *M* ○ *N* ○ *NA*
☒ *Environmental*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
Social	
☒ *Poverty Reduction*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☒ *Gender*	○ *H* ○ *SU* ○ *M* ● *N* ○ *NA*
☐ *Other (Please specify)*	○ *H* ○ *SU* ○ *M* ○ *N* ○ *NA*
☐ *Private sector development*	○ *H* ○ *SU* ○ *M* ○ *N* ● *NA*
☒ *Public sector management*	○ *H* ● *SU* ○ *M* ○ *N* ○ *NA*
☐ *Other (Please specify)*	○ *H* ○ *SU* ○ *M* ○ *N* ○ *NA*

Annex 6. Ratings of Bank and Borrower Performance

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HU=Highly Unsatisfactory)

6.1 Bank performance	*Rating*			
☒ *Lending*	○ *HS*	● *S*	○ *U*	○ *HU*
☒ *Supervision*	○ *HS*	● *S*	○ *U*	○ *HU*
☒ *Overall*	○ *HS*	● *S*	○ *U*	○ *HU*

6.2 Borrower performance	*Rating*			
☒ *Preparation*	○ *HS*	● *S*	○ *U*	○ *HU*
☒ *Government implementation performance*	○ *HS*	○ *S*	● *U*	○ *HU*
☒ *Implementation agency performance*	○ *HS*	● *S*	○ *U*	○ *HU*
☒ *Overall*	○ *HS*	● *S*	○ *U*	○ *HU*

The overall Bank performance is **Moderately Satisfactory** and the overall Borrower performance is **Moderately Satisfactory.**

Bank Lending **Moderately Satisfactory.**
Bank Supervision **Moderately Satisfactory**.

Borrower Preparation **Moderately Satisfactory**.
Government Implementation **Unsatisfactory**.
Implementing Agencies **Moderately Satisfactory**.

Annex 7. List of Supporting Documents

1. World Bank. Project Appraisal Document on a Proposed Credit in the Amount of SDR8.4 Million to the Republic of Uganda . Report No. 2909. Washington D.C. 1996.
2. World Bank. Lake Victoria Environmental Management Program, Project Document, Report No015541-AFR. Washington D.C. June, 1996
3. World Bank. Lake Victoria Environmental Management Program, Staff Appraisal Report, Report No015429-AFR. Washington D.C. June, 1996
4. World Bank. Memorandum of the President, Report No. P-6843 AFR, June 1996
5. World Bank. Development Credit Agreement No. 2909-UG, Washington, DC, September 1996
6. World Bank. Agreement Amending Development Credit Agreement No. 2909-1, Washington, DC, November 2002
7. World Bank. Lake Victoria Environmental Management Project, Supplemental Credit, Report No.P7519, June, 2002
8. World Bank. LVEMP 1 Stocktaking Report– Uganda, Fisheries Management, Fisheries Research, Lake Victoria Fisheries Organization, July 2003
9. World Bank. Aide-Memoirs' from Project Identification Mission in 1992 to last Supervision Mission in December 2005. Washington D.C.
10. World Bank. Uganda - Poverty reduction strategy paper and assessment, Report No. 20317, May 2000
11. World Bank. Poverty Reduction Strategy Paper and Joint IDA/IMF Staff Advisory Note, Report No. 32698, June, 2005
12. World Bank. Uganda - Country assistance strategy (CAS), Report No. 20886, December 2000
13. World Bank. Uganda - Joint assistance strategy - 2005-2009, Report No. 34310, December 2005
14. World Bank. Implementation Completion Report, Final Report, December, 2005
15. World Bank. Transboundary Diagnostic Analysis and Strategic Action Program Development for the Lake Victoria Basin Project, Report No. 29872, March 2004
16. World Bank. Uganda - Lake Victoria Environmental Management Project (Supplemental Credit), Report No. P7519, June 2002
17. World Bank. Back To Office Reports for. The Lake Victoria Environmental Management Program (FY1994) Project ID: P040551 –Loan/Credit No.:). Washington D.C.
18. World Bank. Knowledge and Experiences gained from managing The Lake Victoria Ecosystem, 2005
19. World Bank/UNEP. Discussion Paper on Regional Program for Environmental Management of Lake Victoria, November, 1992
20. World Bank. GEF Trust Fund Grant Agreement No. TF028318, September, 1996
21. World Bank. Uganda Stocktaking Report, Draft, July, 2003
22. World Bank. Lake Victoria Environmental Management Project, Phase 1, Policy and Institutional Framework, UGANDA, Draft, Stocktaking Report, July, 2003
23. World Bank. Lake Victoria Environmental Management Project, Phase 1, Revised Draft, Scientific Stocktaking Report, Progress during LVEMP1 and Challenges for the Future, Prepared by, Robert Hecky, August 25, 2003
24. Project, Period July 1997 – December 2005, Draft Final Report, December, 2005
25. World Bank, Financial Management Review Report for the LVEMP, Consultant, Prime Solutions, May 2006
26. Regional Synthesis report on fisheries Research and Management, Jeppe Kolding, Paul van Zwieten, Julius Manyala, John Okedi, Yusif Magaya, Faustino Orach-Meza; Maun, Wageningen, Dar-es-Salaam, December, 2005.
27. National Synthesis report for fisheries, National Secretariat, Ministry of Environment, Water and Land, September, 2005,
28. Lessons learned report on the Institutional Framework, Dr. Salim A. Bachou, August 2005

29. Lessons Learnt From Catchment Afforestation Pilot Project (Capp) Of The Lake Victoria Environment Management Project (LVEMP), Byabashaija Denis Mujuni, Kampala, Uganda
30. National Lessons Learnt Report, Land Use Management Component – Uganda, Final Report, Kalyebara M. Robert, October 2005
31. Lessons Learnt on the Secretariat's Institutional Framework, Salim A. Bachou, Phd, National Consultant, July 29, 2005
32. Lessons Learned Report, Lake Victoria Environmental Management Project , Micro Project Sub Component, Monica Kapiriri, July 2005
33. Lessons Learnt Report on Wetlands Management Component -Final, Yakobo Moyini, PhD, Consultant, August, 2005
34. Fisheries Management Component, progress 1997-2005, Susan Imende, Component Coordinator
35. Land Use Management Brief, Naro-Kawanda, April, 2006
36. Report on Beneficiary Assessment of LVEMP Supported Micro-Projects in Lake Victoria Basin, Final Report, Julius Otieno Manyala, Consultant, February – April, 2005.
37. Protocol on Sustainable Development of Lake Victoria Basin, November 2003,
38. World Bank: Independent Evaluation of the Support of Regional Programs, Case Study, Shawki Barghouti, 2006
39. Beneficiary Assessment (B.A) For LVEMP, Components- Soil And Water Conservation, Wetlands Management, Catchments Afforestation, Micro-Projects And Community Participation, by: Professor I.K Musoke, Lead Consultant, Dr. M. Nyirabu, Consultant, Mr. D.K Rweyemamu, Consultant, Mr. C. Kadonya, Consultant, December 2005
40. Scientific Stocktaking Report, Progress During LVEMP1 and Challenges for the Future, Prepared by Robert Hecky, August 25, 2003
41. Lake Victoria Environment Report – Uganda, Water Quality and Ecosystems Status Summary, Fredrick J. Muyodi, and Robert E. Hecky, December, 2005
42. Third Overall Performance Study of the Global Environment Facility, ICF Consulting and partners, June 2005
43. GEF International Water Program Study, Prof. Laurence Mee, Prof John Okedi, Mr. Tim Turner, Ms. Paula Caballero, Dr. martin Bloxham Dr. Aaron Zazueta, October 2004

Additional Annex 8. Summary of Regional and Transboundary Issues

The problems connected to Lake Victoria have always been recognized as regional in nature, but prior to the project, had not been dealt with jointly by the riparian countries. By the early 1990s increasing concerns about pollution, water hyacinth, and over fishing led to recognition that a regional program of actions was needed. LVEMP was designed as a regional multi-sectoral comprehensive environmental management initiative. The program was launched through a Tripartite Agreement signed on 15th August 1994 in Dar es Salaam covering in the first place the three EAC states. This was inherently challenging given the political situation in the countries. Regional cooperation at the time was at a low level, and no other regional activities succeeded in getting off the ground. Furthermore, the relations between Kenya and the donor community were strained.

The impact of the degrading environment of the lake on the population was serious. Around 3 million people were dependent directly from the fisheries sector activities. In addition, the human activities of the steadily increasing number of people in the basin (today estimated at around 30 million people), in various ways were contributing to worsening of the situation. Lake Victoria was, and remains at risk from the major global environmental threats identified by the Global Environmental Facility (GEF) in its Operational Strategy for International Waters:

(a) degradation of water quality due to pollution from land-based activities;
(b) introduction of non-indigenous (and often pervasively dominant and colonizing) species,
(c) excessive exploitation of living resources, and
(d) global climatic changes.

There is concern that the severity of the current drought, which in some parts has largely lasted for three years and has contributed partly to the lake level reduction (the other factor is the drawdown of the lake for production of hydro-power by a riparian country), might be linked to global climatic changes. The need for support from the Global Environment Facility's (GEF) was thus fully justified. GEF was a key co-financier of the project, with a grant of 35 million in total to the three countries (accounting for 45 percent of the original project cost) in the first phase of the program.

The status of main issues of regional and transboundary nature that have been and remain relevant can be briefly listed as follows:

a) Political regional cooperation:

Until LVEMP was launched, cooperation between the three countries at the political level had been low since the break-up of the first EAC in the late 70s. The planning and launching of LVEMP, heavily facilitated by the international community with the World Bank and GEF in the lead, was the first serious attempt to bring the parties together over the management of common resources. Later the countries revitalized the EAC, and it is increasingly the leading institution for political and other coordination of regional efforts. The Lake Victoria Basin Commission (LVBC) was established in 2005, operational in Kisumu, Kenya from mid-2006, and is now coordinating and facilitating the Lake Victoria Development Program (LVDP) that encompasses various initiatives in the basin. (Figure 3 illustrates the interactions of LVDP and the EAC Partnership

with other main stakeholders, and Figure 4 shows some of the main activities in the lake basin).

b) Technical and scientific regional cooperation:

With the launching of the LVEMP, the regional cooperation between scientists and other scholars gained significant momentum and resulted in sharing of data and methodologies, preparing the base for joint regional planning of research and monitoring activities and standard-setting. Numerous seminars and workshops with regional participants in all the three countries have been held. Communication links have been established, and these will continue to function during LVEMP 2 and under other basin initiatives. Despite accomplishments in coordination of scientific efforts, the regional dissemination of the scientific papers and reports has not been satisfactory, due in part to limited capacity and and in part to apparent insufficiencies in trust and openness among all scientific partners. Dissemination and regional cooperation in the future will require continued efforts, and will largely be coordinated by the LVBC under EAC.

c) Fisheries:

LVEMP supported the establishment of Lake Victoria Fisheries Organization (LVFO). This organization is now operational with substantial support from the European Union (EU), especially in implementation of the comprehensive Lake Victoria Integrated Fisheries Management Plan (IFMP). The harmonization of the fisheries legislation across the three countries has been a significant achievement, considering the competitive nature of the sector reflected in the substantial monetary value of the fishing industry and export. In spite of the efforts so far it is clear that the fisheries sector still has some way to go in achieving a sustainable extractive level. Over-fishing is still prevalent, exacerbated in Uganda by the substantial over-capacity in the fish processing industry (capacity utilization is less than 50% at present). Uganda also disagrees with the views of the other two countries regarding the level of sustainable fish harvest. There remains a need for ongoing monitoring of fish extraction combined with additional efforts to assess the stock, agree on a sustainable catch, and establish mechanisms to enforce it.

d) Eutrophication of the Lake:

The high level of nutrients entering the lake enhanced the environment for water hyacinth leading to infestation. The infestation was significantly reduced (by around 85 percent) to non-nuisance levels and is the a tangible, visible, and much appreciated change in the lake. The pollution that contributes to the excessive accumulation of nutrients remains a concern, however, and is a priority for the next phase. Furthermore, the Kagera River (originating in Rwanda and Burundi), continues as a significant source of water hyacinth, as the bio-control agents perform less well in the rivers as compared to the lake. Research to deal with this problem continues. The time series of data regarding water quality is not yet of sufficient duration to establish definitive trends in levels of key pollutants in the lake, but the data do allow preliminary conclusions about the direction (rising), sources (relative importance of point and non-point), and importance (likely nonlinear reaction of the lake to increased pollution).

Eutrophication resulting from increased pollution is a function of multiple pressures on the lake; e.g., increased economic activity and a higher population in the basin resulting in increased municipal and industrial wastewater, run-off from non-point urban and semi-urban pollution

sources, inadequate measures to treat the discharges. Pilot efforts undertaken to date in the catchment area have shown that rural non-point pollution from erosion can be controlled, but the measures do not yet have a cumulative impact on the lake. The key pollution sources in the near-shore areas are the surface run-off and wastewater from towns and communities. The pollutants in the open lake are largely entering through precipitation (atmospheric deposition) and probably derive from products of wind erosion and bush fires transported over long distances. It is not known whether this pollution is generated within or outside of the Lake Victoria basin. A focused medium-sized program supported by GEF and covering countries both within and outside the basin is seeking to develop a monitoring effort to track the sources of atmospheric deposition.

e) Land degradation in the region:

Land degradation is prevalent in certain areas of the basin, in all three countries. The still common practice of burning bush for agricultural purposes contributes both directly and through increased erosion from bare soil to atmospheric deposition (that accounts for around 84% N and 75% P) of nutrients going into the lake. Over-grazing and unsustainable agricultural practices also lead to increasing erosion and contribute to the increased silt content in the rivers and subsequent sedimentation where rivers join the lake and even farther offshore. Rivers contribute to about 23% of total P and 15% of nitrogen into the lake. The loss of soil nutrients heavily constrains productivity of the land, with a cyclical impact on poverty, livelihoods and the quality of both land and water. The use of fertilizers is presently limited in the area, but this is likely to change with enhanced emphasis on agricultural productivity. The project has started awareness raising and implementation of improved farming practices in pilot areas in the basin in all three countries, and these have led to localized reductions in erosion, increased yield and higher incomes for participating farmers. Afforestation activities are judged to have had a limited but beneficial impact as well. A number of the micro-projects (notably those focusing on protection of water sources, etc.) allow communities to shift to more benign practices.

f) The lake level and riparian communities:

The decline in the level of the lake during the last two years cannot be attributed to activities supported under the LVEMP project, but clearly affects the outcome of the project. About half the reduction in lake levels can be attributed to the drought of the last three years, and the remainder results from over-abstraction of water for hydropower generation at Jinja, the main energy source of Uganda.

The reduced lake level has significantly and negatively affected the communities living on the lake shore. As the lake is shallow many places, the shore has receded several hundred meters at some locations, leaving the landing piers on dry land. Access to the lake is more difficult and the resulting handling of fish creates more waste and reduces quality (see attached photo from Musoma). Some of the wetlands have dried, with the result that farming communities have started to cultivate in wetlands (reference to photos form the Musoma and Mara Regions in Tanzania). The receding lake shore has increased costs associated with the use and maintenance of infrastructure for water supply. The drying of wetlands also affects fish biodiversity, wetland fishing, and production and utilization of wetland products for handicrafts. For example, the reduced level threatens the spawning grounds for fish, creating potentially significant risks to the

fishing effort.

As noted in the text of the ICR, Heads of State of the riparian countries have met to discuss the seriousness of the declining lake level and as a result overabstraction has declined, although not to levels sufficient to allow the level to stabilize or increase. Discussions among the riparian countries on this problem continue.

g) Other initiatives in the basin:

Figure 4 shows that several initiatives are running concurrently in the basin, all having environmental issues and natural resources as their main objectives. There are numerous NGO-based activities, many supporting transboundary and regional approaches. These activities have so far not been very actively or effectively coordinated, and this has contributed to duplication of efforts and overlapping activities both geographically and thematically. The creation of the LVBC in Kisumu with an explicit mandate to coordinate improves prospects for better alignment of various efforts in the future.

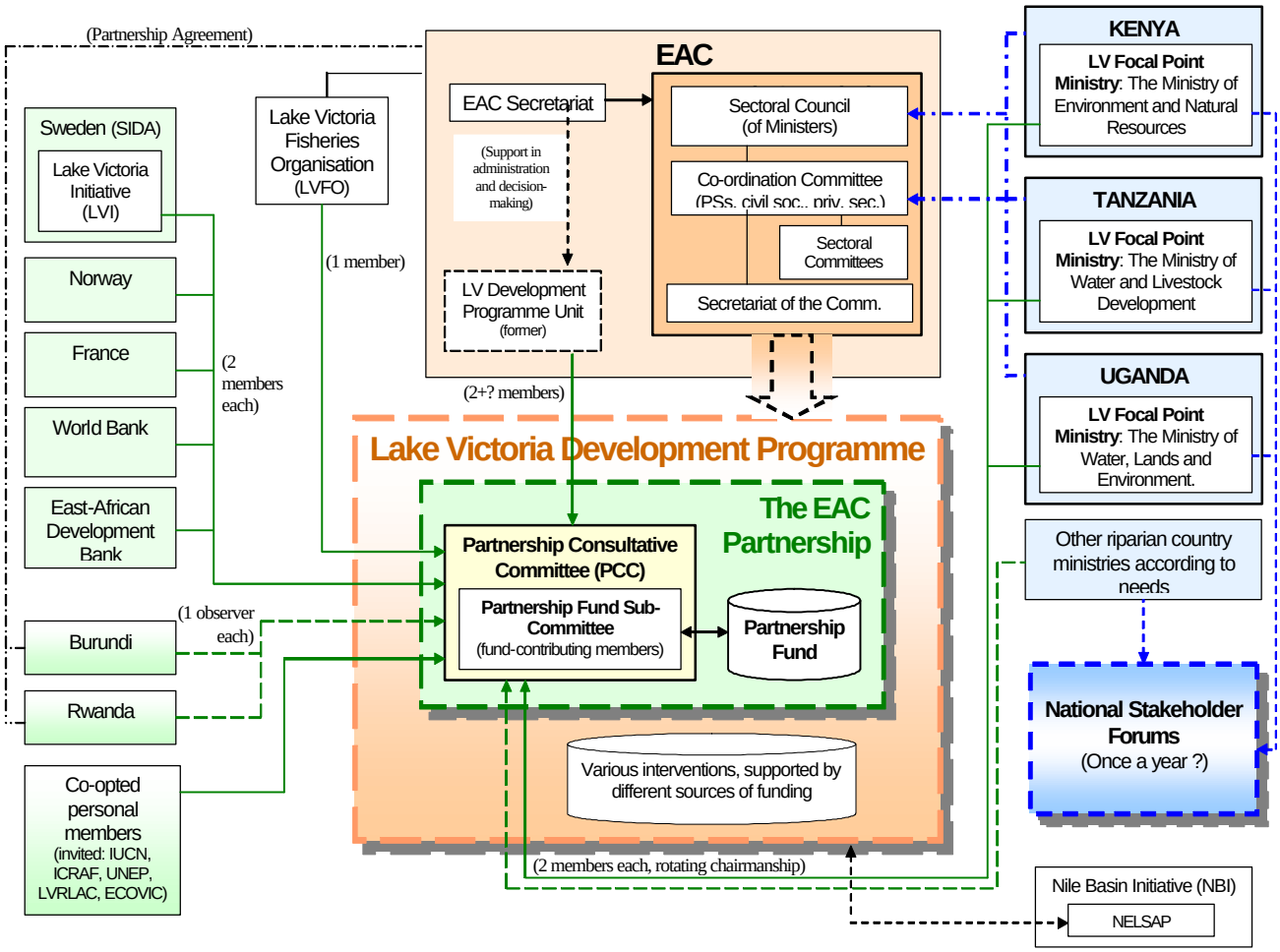


Figure 3: The Lake Victoria Development Programme and the EAC Partnership (Figure from EAC Partnership Fund Review Report November 2005, by Tore Laugerud, NCG)

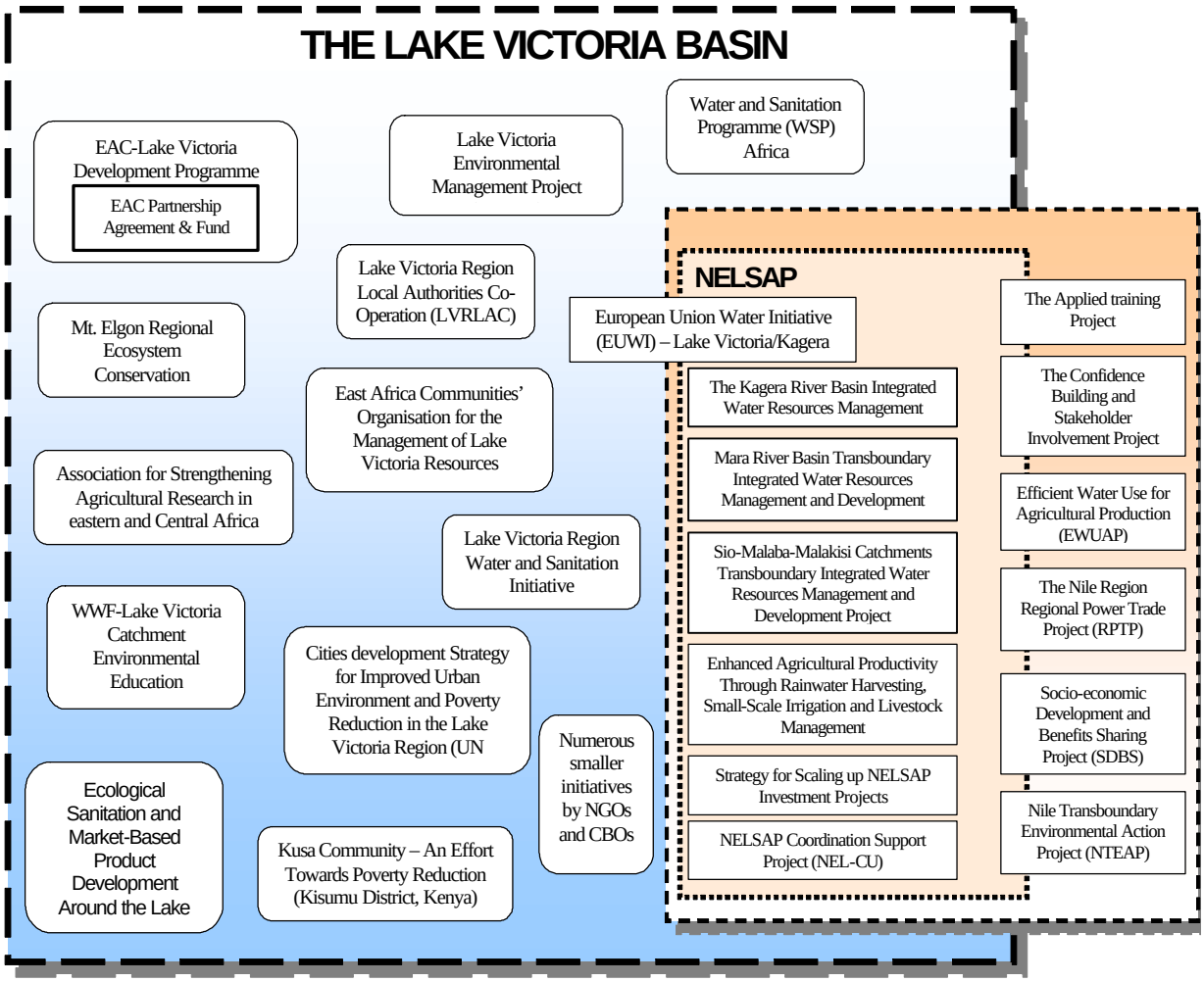


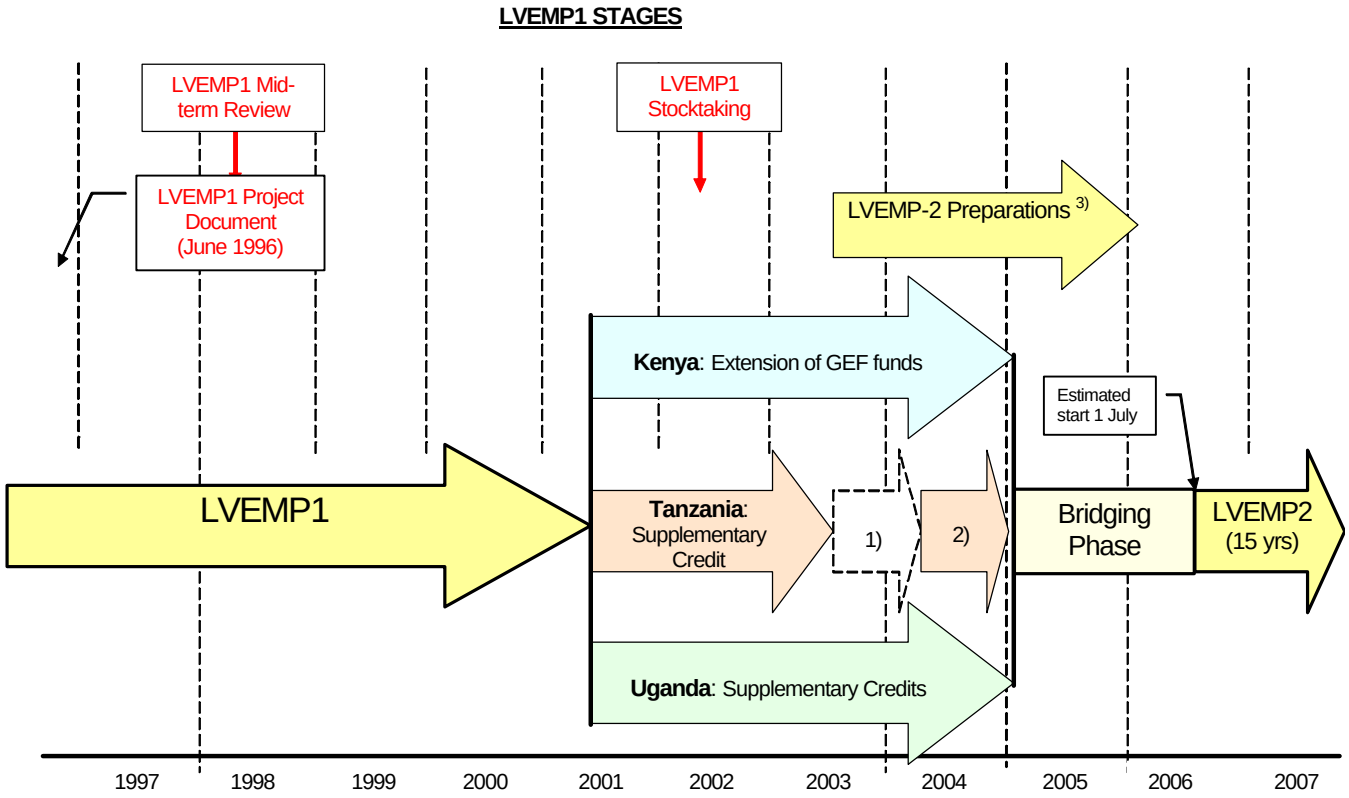
Figure 4: Overview of key environmental interventions in the Lake Victoria Basin (Figure from EAC Partnership Fund Review Report Novmber 2005, by Tore Laugerud, NCG)

Effects of reduction of Lake Victoria water level at Musoma, Tanzania (© Tore laugerud, NCG March 2006)

Cultivation in dried up wetlands, Musoma, Tanzania (© Tore Laugerud, March 2006)

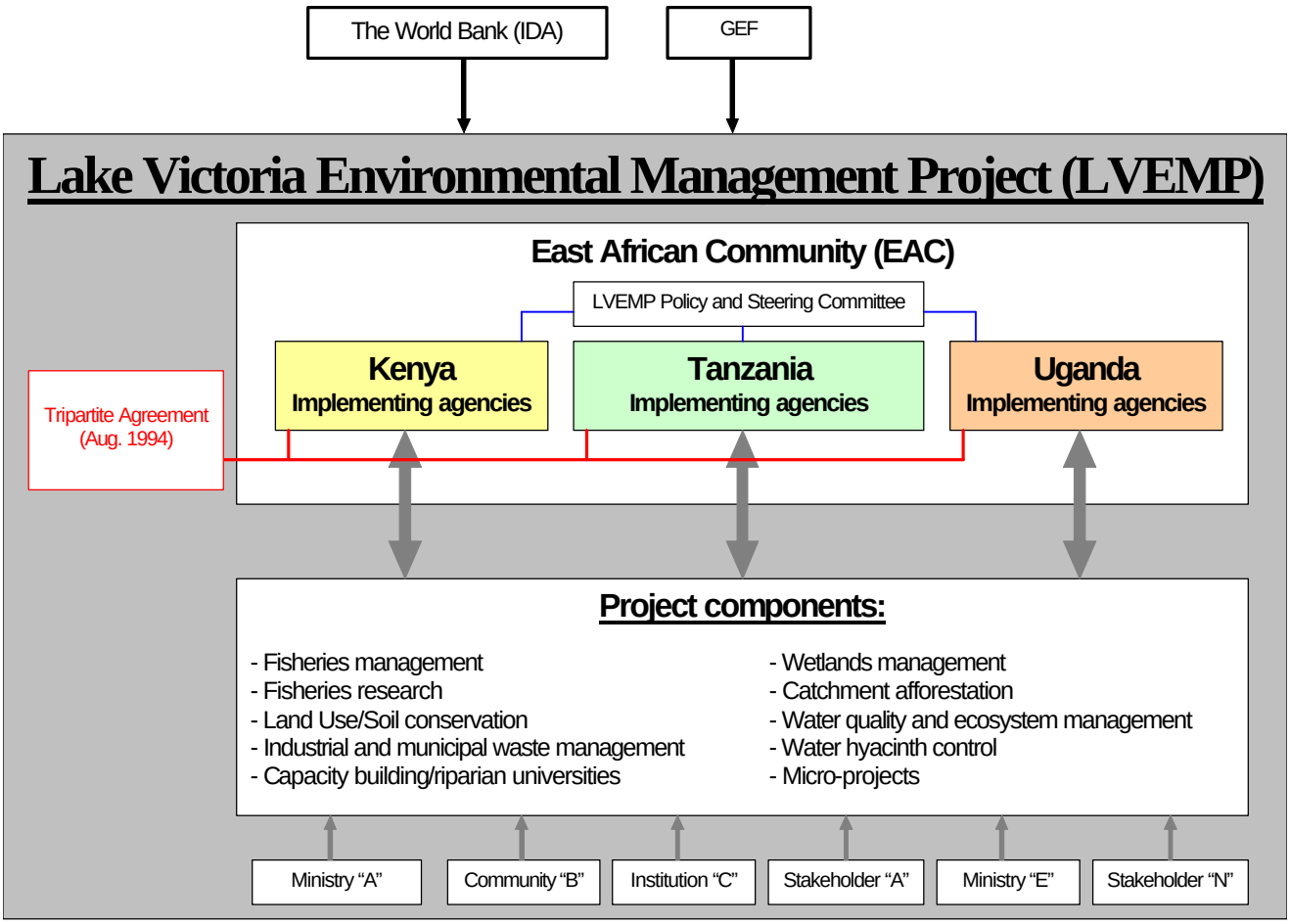
Additional Annex 9. Project Timeline and Structure - Figures

Figure 1: Different Stages of LVEMP1



NOTES:
1): Activities continued for 8 months with counterpart funds only
2): Supplementary Credit issued in June 2004, but delayed due to bureaucratic procedures
3): LVEMP-2 preparations funded by Japan (Policy and Human Resources Development) and GEF (Transboundary Diagnosis Analysis, incl. Burundi and Rwanda).
4): In total, almost USD 85 million has been spent under the project, around 52% of this being grants from GEF, the rest being credits from IDA. The distribution of the total funds between the countries has been: Kenya-29%, Tanzania-35%, and Uganda 36%.

Figure 2: Overall Project Structure



Additional Annex 10. List of Persons Contacted

Name	Position/Title	Institution
IN UGANDA		
John S. Balirwa	Director	National Fisheries Resources Research Institute (NAFIRRI), Jinja, National Agricultural research Organisation (NARO)
Fred M. Wanda	Component Coordinator	Fisheries Research Component, FIRRI/NARO
Levi Muhoozi	Senior Research Officer (SRO)	---"---
Alice Endra	Information Specialist	---"---
Gertrude Namulemo	Research Officer (RO)	---"---
Margaret Aanyr	RO	---"---
Godfrey Mbahinzireki	SRO (Task Leader Aquaculture)	---"---
Ali Olona	F&AO	---"---
Stephen Sekiranda	RO	---"---
Lucas Ndawula	SROT (Task Leader)	---"---
Moses K. Magumba	CLT	---"---
Winnie Nkalubo	RO	---"---
S.B. Wandera	SRO	---"---
Taabu A. Munyaho	RO	---"---
Konstantin Odongkara	PRO (Task Leader Socio-Economics)	---"---
Fred M. Wanda	SRO (Task Leader Water Hyacinth)	---"---
William Okello	RO, Fish Limnologist	---"---
Isaac Mukobe	Training/Outreach Officer	---"---
Patrick Bwire	A&A, System Administrator	---"---
Joyce Akunu	ROI	---"---
Mr. Raju	Chief Agronomist	Kakira Sugar Works, Jinja
Franck Ovondo	Field Assistant, Katuma	Agro-Chemical Sub-Component, Kakira Sugar Works, Jinja
Thomas Wanyika Maembe	Executive Director	Lake Victoria Fisheries Organisation (LVFO), Jinja
Richard Ogutu-Ohwayo	Dep. Executive Director	---"---
James Scullion	Project Manager	Lake Victoria Integrated Fisheries Management Plan (IMFP) under LVFO, MRAG/PMTC/Lemans Consortium
Francis John Oumbo	Technical Assistant	Agro-Chemicals Sub-Component, Kakira Sugar Works, Jinja
Christopher Kanyesigye	Quality Control Manager, Component Coordinator	Industrial and Municipal Waste Management, National Water and Sewerage Corporation (NWSC), Kampala
Richard Ouo	Sen. Analyst	---"---, NWSC
Sara Tebatemwa	Principle Analyst	---"---, NWSC
Moses Bigabua Bategeka	Sewerage Engineer	---"---, NWSC, Bugulobi Wastewater Treatment Plant

Name	Position/Title	Institution
Joel Kinobe	Lecturer. Tertiary Municipal Wastewater Treatment Sub-Component	---"---, Makerere University. Institute of Environment & Natural Resources
Gregory Murinzi	Laboratory Technician	---"---, NWSC (Sampling at Jinja WWTP)
Fredrick W. Kiwaszi	Regional Wetlands Coordinator (Central Region), Component Coordinator	Wetland Management Component, Wetlands Inspection Division, Min. of Water, Lands and Environment
Lucy Iyango	Wetland Community Management Officer, Wetland Products Sub-Component	---"---
Richard Kyambadde	Research Associate, Buffering Capacity Sub-Component	---"---
G. Isabirye Basuta	Project Coordinator	Capacity Building/ Riparian Universities Component, Dept. of Zoology, Makerere University, Kampala
Yusuf S. Kizito	Associate Professor	---"---
Fredrick Bugenyi	Lecturer	---"---
Nsubuga Senfuma	Commissioner, Component Coordinator	Water Quality and Ecosystem Management Component, Water Resources Management Dept., Directorate of Water Development, Min. of Water, Lands and Environment, Entebbe
Leo Mwebembezi	Hydrologist, Task Leader Sedimentation	---"---
Abudallah K. Matoru	Senior Analyst, Task Leader Eutrophication	---"---
Jackson Kitamirike	Scientist, Microbiologist. Task Leader Modelling	---"---
Patrick Kahangire	Executive Director	Nile Basin Initiative, Entebbe
Simon Thuo	Regional Coordinator, East Africa	Global Water Partnership (located with Nile Basin Initiative)
Matthias K. Magunda	Director of Research, Component Coordinator	Land Use Management Component, Kawanda Agricultural Research Institute, National Agricultural Research Organisation (NARO)
Onesimus Semalulu	Head of Pollution Loading Sub-Component	---"---
Drake N. Mubiru	Head of Agro-Chemicals Sub-Component	---"---
Moses Isabirye	Research Officer	---"---
Keizire Boaz Blackie	Component Coordinator and Task Leader Fish Levy trust	Fisheries Management Component, Dept. of Fisheries Resources, Min. of Agriculture, Animal Industry and Fisheries
Bakunda Aventino	Sen. Fisheries Officer (former Task Leader Microprojects)	---"---
Joyce I. Myeko	National Coordinator Fisheries Co-Management, Task Leader Community Participation	---"---
Julius Ogwal	Task Leader Quality Assurance	---"---

Name	Position/Title	Institution
Jack Wadanya	Principle Fisheries Officer (PFO), Task Leader FS/Data Collection	---"---
Rhoda Tumwebaze	Coordinator, Integrated Fisheries Management Project (IFMP)	Dept. of Fisheries Resources, Min. of Agriculture, Animal Industry and Fisheries
Omar Wadda	BNK, Component Coordinator	Water Hyacinth Control Component, Dept. of Fisheries Resources, Min. of Agriculture, Animal Industry and Fisheries
Edward Rukunya	Sen. Fisheries Officer	---"---
Gershom Onyango	Assistant Commissioner, Component Coordinator	Catchment Afforestation Component, Forestry Inspection Division, Min. of Water, Lands and Environment
Margaret A. Mwebesa	Task Leader Catchment Afforestation	---"---
Various	Members	Kirangira Farmers Association (a CBO), Kabgambo Sub-County, Rakai District
Various	Members	Nyanga-Kentale Environment Group/Nursery Group, Rakai District
Hajati Sikitoleka	Farmer	Rakai District
Harriet Nannyonjo	Sen. Operations Officer	The World bank, Kampala
Richard Olowo	Procurement Specialist	---"---
John Wambede	Operations Officer	---"---
Linu Musana	National Executive Secretary, LVEMP Bridging Phase	LVEMP National Secretariat, Entebbe
Itaza Muhurwa	Procurement Officer	---"---
Faustino L. Orach-Meza	Project Advisor, former National Executive Secretary	---"---
Robert Kalama	Accountant	---"---
ELSEWHERE		
Ladisy K. Chengula	Sen. Natural Resources Management Specialist. LVEMP Task Team Leader (TTL)	The World Bank, Nairobi
Moses Wasike	Financial Management Specialist	---"---
Ernst Lutz	Sr. Sector Economist, former LVEMP TTL	The World Bank, Washington
William Lane	Former LVEMP TTL	---"---
Richard Kaguamba	Former LVEMP TTL	---"---
Graeme Donovan	Former LVEMP TTL	Pensioner
Robert Hecky	Senior Scientist, Water Quality/ Limnology	Waterloo University , Canada
Ian Cowx	Senior Scientist, Fisheries	Hull University, U.K.
Alfred M. Duda	Senior Advisor, International Waters	Global Environmental facility (GEF), Washington
Andrea Merla	Advisor, International Waters	---"---