

Document of  
The World Bank

Report No: 36557

IMPLEMENTATION COMPLETION REPORT  
(IDA-29070 TF-28662 TF-28319)

ON A

INTERNATIONAL DEVELOPMENT ASSOCIATION (IDA) CREDIT

AND A

GLOBAL ENVIRONMENT FACILITY (GEF) GRANT

IN THE AMOUNT OF US\$ 24.3 MILLION

TO THE

GOVERNMENT OF KENYA

FOR THE

LAKE VICTORIA ENVIRONMENTAL MANAGEMENT PROJECT (LVEMP)

June 27, 2006

## CURRENCY EQUIVALENTS

(Exchange Rate Effective )

Currency Unit = Kenya Shillings

## FISCAL YEAR

July 1 June 30

## ABBREVIATIONS AND ACRONYMS

AM	Aide Memoires
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	Kenya 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
NARO	National Agricultural Research Organization
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	Colin Bruce
Sector Manager	Karen Brooks
Task Team Leader/Task Manager:	Ladisy Chengula

**KENYA**  
**KE: Lake Victoria Env. Proj. (IDA)**

**CONTENTS**

	<b>Page No.</b>
1. Project Data	1
2. Principal Performance Ratings	1
3. Assessment of Development Objective and Design, and of Quality at Entry	2
4. Achievement of Objective and Outputs	6
5. Major Factors Affecting Implementation and Outcome	11
6. Sustainability	13
7. Bank and Borrower Performance	14
8. Lessons Learned	17
9. Partner Comments	19
10. Additional Information	19
Annex 1. Key Performance Indicators/Log Frame Matrix	30
Annex 2. Project Costs and Financing	32
Annex 3. Economic Costs and Benefits	34
Annex 4. Bank Inputs	37
Annex 5. Ratings for Achievement of Objectives/Outputs of Components	40
Annex 6. Ratings of Bank and Borrower Performance	41
Annex 7. List of Supporting Documents	42
Annex 8. Summary of Regional and Transboundary-related Issues	44
Annex 9. Project Timeline and Structure - Figures	51
Annex 10. List of Persons Contacted	53

<i>Project ID:</i> P046838	<i>Project Name:</i> KE: Lake Victoria Env. Proj. (IDA)
<i>Global Supplemental ID:</i> P046871 ( <i>Fully Blended</i> )	<i>Supp. Name:</i> Lake Victoria Env. (GEF)
<i>Team Leader:</i> Ladisy Komba Chengula	<i>TL Unit:</i> AFTS2
<i>ICR Type:</i> Core ICR	<i>Report Date:</i> June 27, 2006

## 1. Project Data

*Name:* KE: Lake Victoria Env. Proj. (IDA) *L/C/TF Number:* IDA-29070; TF-28662  
*Country/Department:* KENYA *Region:* Africa Regional Office

*Sector/subsector:* Agricultural extension and research (38%); General water, sanitation and flood protection sector (29%); General agriculture, fishing and forestry sector (16%); Central government administration (13%); Animal production (4%)

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

### KEY DATES

	<i>Original</i>	<i>Revised/Actual</i>
<i>PCD:</i> 12/28/1992	<i>Effective:</i> 03/05/1997	03/05/1997
<i>Appraisal:</i> 11/21/1995	<i>MTR:</i> 03/01/1999	03/01/1999
<i>Approval:</i> 07/30/1996	<i>Closing:</i> 12/31/2002	12/31/2002

*Supplemental Name:* Lake Victoria Env. (GEF) *L/C/TF Number:* TF-28319

*Sector/subsector:* Agricultural extension and research (38%); General water, sanitation and flood protection sector (29%); General agriculture, fishing and forestry sector (16%); Central government administration (13%); Animal production (4%)

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

### KEY DATES

	<i>Original</i>	<i>Revised/Actual</i>
<i>GEF Council:</i> 04/01/1999	<i>Effective:</i> 03/05/1997	03/05/1997
<i>Appraisal:</i> 11/21/1995	<i>MTR:</i> 03/01/1999	03/01/1999
<i>Approval:</i> 07/30/1996	<i>Closing:</i> 12/31/2002	12/31/2005

*Borrower/Implementing Agency:* GOVT OF KENYA/MINISTRY OF ENV. AND NATURAL RESOURCES

*Other Partners:*

### STAFF

	<i>Current</i>	<i>At Appraisal</i>
<i>Vice President:</i>	Gobind T. Nankani	Callisto E. Madavo
<i>Country Director:</i>	Colin Bruce	James Adams
<i>Sector Manager:</i>	Karen McConnell Brooks	Sushama Ganguly
<i>Team Leader at ICR:</i>	Ladisy Chengula	Graeme Donovan
<i>ICR Primary Author:</i>	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:* U

*Sustainability:* L  
*Institutional Development Impact:* SU  
*Bank Performance:* S  
*Borrower Performance:* U

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

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

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

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

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

---

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

#### *3.1 Original Objective:*

**Background and Context:** The Kenya 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 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 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 was fully blended.

**Assessment of Project Objectives 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. 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 International Waters Program. Within the fully blended project, GEF activities were focused on transboundary aspects such as fisheries (biology and conservation) research, monitoring of water quality, capacity building in the riparian universities, support for policy and coordination, and control of water hyacinth, with some attention to aquaculture and sustainable use of wetlands. 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 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. The component level objectives were fluid 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, 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, activities were differentiated according to whether they were lake-wide or geographically focused pilots, an approach that was largely maintained during implementation, with adjustments as the components were revised. 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. Despite a tendency toward insularity within the components, cross cutting issues were important; e.g., the cross-cutting issue of community participation were overseen by an officer in the Secretariat in Kisumu, 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 Industrial and Municipal Waste Management component was subsumed into the Water Quality component and was narrowed to address only tertiary treatment. Similarly, sub-components addressing Pollution Loading (point and non-point sources of pollution) and the Role of Agrochemicals were combined into the Water Quality component. As a result, the component became large and unwieldy. It was functionally oriented toward research although its mandate included management of point and non-point pollution sources. Changes undertaken at the MTR 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 Kenya 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 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 the 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 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 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; ie., 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. The changes did not entail a major restructuring of the project or revision of the initial design, and the project was after the MTR able to make up for some of the lost time. Because a number of dimensions of design were strong and the deficiency in readiness for implementation was addressed 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 Unsatisfactory**, and the achievement of the development objectives (outcomes) was **Unsatisfactory**.

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 major 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 Lake Victoria Fisheries Organization was operationalized, although it requires strengthening. Fisheries sector frameworks were harmonized and regional information exchange was strengthened. 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) based in Kisumu. A common Lake Victoria vision was developed by the partner states with extensive consultation at the community level. Through the EAC and LVBC it is expected that the riparian states will be in a strong 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 remains functioning. Better land management in the catchment and wetlands contributed to the reduction of silt and pollution entering the lake. The pilots and investments under the industrial and municipal effluent management, however, were not successful and untreated waste continues to flow into the lake almost unabated.

### **Building capacity for ecosystem management**

Much of the activity in the project was 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 to 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 Kenya the pace of implementation improved marginally following changes made after the initial delay but was hampered by the systemic issues that constrained the flow of funds and procurement. Implementation in Kenya lagged behind the other two countries through most of the project. The poor performance of the project and its unsatisfactory rating necessitated closing of the IDA credit (with 30 percent undisbursed) at the end of 2002, further reducing the scope of activities. The GEF grant remained open to facilitate Kenya's continued participation in regional activities. With lower funding relative to the two other partner states, the scale of achievements was lower despite some improvement in implementation in the last years. As was the case in the other countries, 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. This was a fully blended IDA/GEF project until the closure of the IDA credit, 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 lack of success in addressing direct pollution from point sources diminished achievement of goals for water quality of particular importance to GEF. Kenya was able to accomplish enough through the project to contribute inputs required from the country for the shared scientific findings noted above, although Kenya's contribution was less than that of the other two partners. Moreover, Kenya has remained a full partner in establishing and supporting the institutions for regional management of the resource; e.g., Kenya signed the Lake Victoria protocol and now hosts the LVBC. Despite these notable accomplishments and contributions, the localized activities within Kenya that would have benefited communities and the lake were less successful than in the other two countries due to persistent problems in implementation noted below. As a result of the diminution in accomplishments due to difficulties in implementation, the project in Kenya is judged to be moderately unsatisfactory in meeting outputs, and unsatisfactory in meeting objectives.

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 shows mixed results.

#### Fisheries Management

**Satisfactory.** Support to co-management and creation of Beach Management Units (BMUs) has helped bring an estimated decline in illegal fishing by about one third. The component achieved notable success in harmonizing the fisheries legislative and regulatory frameworks among the three countries. The Fish Levy Trust (FLT) is not yet operational in Kenya. Gazetted fishing areas were established as were Community Conservation Committees; closed fishing seasons were instituted but need to be enforced.

#### Fisheries Research

**Marginally Unsatisfactory.** Data were collected, but as noted in the assessment of the synthesis report and in the closing aide-memoire by the consultant specialist, analysis is at a basic level. Although a baseline and trends have been established, factors driving many of the observed trends and implications for management have not been elucidated. Some of the studies (e.g., socioeconomic) were qualitative and conducted only once, revealing no trend or variation information. Final versions were produced with long delays.

#### Water Quality and Ecosystem Management

##### **Marginally Unsatisfactory.**

Although pollution hotspots were identified, the merged component (including Water Quality, Industrial and Municipal Waste Management, and Management of Pollution Loading) became too focused on data collection with inadequate emphasis on addressing the critical pollution problems in the lake, especially related to urban wastewater flowing into the Winam Gulf at Kisumu. An industrial tertiary treatment pilot was set up but not subsequently applied on a larger scale. Improvement of Kisumu wastewater treatment plant had to be deferred when it became clear that IDA financing would not be extended. Attempts were made to model factors affecting water quality without solid success.

### Water Hyacinth Control

**Highly Satisfactory.** Even though the objective sought to strengthen capacity, this component was able to move further and address the problem itself. There has been a remarkable decrease (85 percent) in the water hyacinth infestation in the Lake, which is down to non-nuisance levels. One of the pilots supported in Kenya under this component was subject to an Inspection Panel (discussed below) when an Non-Governmental Organization (NGO) complained that communities had not been consulted sufficiently regarding experimental mechanical chopping of hyacinth in their area. As a result of the Inspection Panel, emphasis on consultation and community outreach in implementation of the project was increased. Mechanical chopping as a control mechanism was not further pursued because by that point it was clear that biological control was a superior approach.

### Wetlands Management

**Satisfactory.** Many scientific outputs were generated including an information baseline, maps, buffering capacity characteristics, contribution to the Wetland Policy (in draft), and community outreach activities. Use of wetland products in handicrafts was strengthened both in Kenya and regionally.

### Soil and Water Conservation

**Satisfactory.** The component developed and tested approaches to reduce erosion in the catchment, and conducted an assessment quantifying soil erosion and its impact in the pilot areas. An estimated 7.5 % of Nyando River Catchment Area (0.4% of Lake Victoria basin) is considered conserved due to activities under LVEMP and sediment loads in the Nyando river have decreased. The river ranked second in terms of sediment in 1997 but dropped to fifth as of 2004.

### Catchment Afforestation

**Marginally Satisfactory.** The component undertook various activities in afforestation with support to community nurseries. It did not track cost-effectiveness, survival rate or have an exit strategy in place, which is likely to impede the success and survival rate of many of its activities. Nevertheless, the component collaborated with other catchment based activities to opportunities for diversification for communities. It is expected that the experience gained through this project will be useful in Kenya's implementation of its Forest Policy, which emphasizes co-management.

### Capacity Building - Support to Moi University, Department of Fisheries and School of Environmental Sciences

**Marginally Unsatisfactory.** While it was planned to increase the capacity of the University in conducting research on issues important for Lake Victoria, the amount of funding during implementation was found to be insufficient for research and was therefore channeled to sponsoring and increasing the number of graduates. Whether the quality of graduate teaching was enhanced was difficult to determine.

### Institutional Framework - National Secretariat

**Unsatisfactory.** The national secretariat was under the Ministry of Environment, Natural Resources and Wildlife, and reported to the Permanent Secretary of the ministry. The office was originally in Nairobi at the ministry headquarters, but moved to Kisumu in 2001/02 to be nearer the project operations, partly staffed by seconded ministerial staff and contract staff. Although systemic issues were a key factor in the delays in flow of funds, the secretariat's was unable effectively to address the problem. Long and continued dissatisfaction with the Secretariat's performance resulted in the termination of the National Executive Secretary's contract in May 2002. A new Secretary was appointed who remained until the end of 2002, when the whole Secretariat was dismissed due to heightened dissatisfaction with observed performance.

Kenya Agricultural Research Institute (KARI) was then made the implementing agency in recognition of KARI's past success in implementation of projects and due to the need to find an agency able to implement the GEF financed activities that had to continue in Kenya for the regional effort to succeed. The transition was far from smooth and the new secretariat was only able to come on board in late 2003. This secretariat functioned strictly in a coordinating role and left implementation to the components. The components did appreciate the facilitative role of the coordinator in Kisumu, and KARI supported an increased pace of implementation compared to the earlier period. Nevertheless, implementation continued to be constrained by new problems with flows of funds. A detailed audit of financial management after the shift of responsibility for implementation to KARI revealed problems of commingling of project funds, resulting in some financing of LVEMP activities out of other sources, and use of LVEMP funds for other activities. Delays in flow of funds even after the transfer of implementing responsibility constrained activity within the components, and reduced overall effectiveness.

#### Micro-projects and Community Participation

**Highly satisfactory.** Although a community participation officer was brought in only in 2000, the project was able to involve communities in activities throughout the components. The approach was also well-planned and executed. Guiding principles for community participation were prepared. The activities led to increased capacity in the communities, enabling them to improve resource management, with positive environmental externalities as well as improved livelihoods. The project targeted service delivery among the Lake basin communities by implementing a range of demand driven projects in health, water, education, sanitation, access roads, afforestation and fisheries sectors. Micro-projects provided strong incentives for communities to interact and implement a range of solutions. A total of 81 projects were initiated out of which 80 were operating at project closure. The approach involved NGOs and introduced gender considerations including development of a gender strategy and attention to HIV/AIDS.

#### *4.3 Net Present Value/Economic rate of return:*

A standard ERR was not estimated in the SAR, as is often the case for projects with major emphasis on capacity strengthening and institutional reform. This section aims to provide some indicative socio-economic data and a discussion on the observed benefits, corresponding to the discussion of potential benefits in the SAR.

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. The size of the lake basin economy is estimated at 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 grown from 25 million to an estimated 30 million people, while general standards of living are between USD 90-270 per capita per annum (based on national figures). It is estimated that fisheries contribute about 5 percent to the Kenyan economy. In Kenya the population in the lake basin is very young and accounts for 40 percent of the country's people. The population density is 320 persons per square kilometer. The quality of the environment and the status of the natural resources are critical factors in the maintenance and growth of incomes and reduction of poverty.

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.

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. It is estimated that a majority of this production is artisanal fishery. Figures for Kenya on the gross employment in fishing and related activities are not available. Domestic consumption is estimated at USD 94 million (2004). 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. In Kenya the estimated export value was about USD 57 million in 2004. A rough estimation of avoided losses in the period 2000-2003 due to measures taken to improve quality assurance and the lift the temporary ban on exports to the EU ban, is USD **26 million**, while the cost of upgrading the fish quality laboratory was in the range of USD 500,000. The national ICR estimates the discounted net present value of sustained export earnings at presently observed levels at US \$ 200 million for Kenya.

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. Estimates from the national ICR put the present value of avoided costs for Kenya at US \$ 8 – 13 million. (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. BMUs and community common interest groups (CIGs) 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., 4 Ph.D. and 28 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 Lake Victoria Fisheries Organization was created. 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 subsequent 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. Approval of Uganda's supplemental credit was stalled in Parliament for approximately one year. 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 power generation by one of the partner countries. 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. The project provided a forum for the partners to recognize and begin to address the declining lake level, but avoidance of the decline was not

within the control of the Kenyan government or implementing agency. (iii) The drought also 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.

#### *5.2 Factors generally subject to government control:*

The systemic fiduciary management issues significantly hampered project implementation in Kenya. The consistently poor performance of the secretariat could have been addressed more effectively. Given the scale of this project in terms of the number of implementing agencies, both management and mainstreaming were concerns. The lack of a national policy and technical steering committee or closer oversight by senior representatives of the implementing agencies resulted lack of prioritization, weak strategic focus, and poor coordination. The lack of a distinct pathway for feeding the outputs and results of the project into the mainstream functioning of the implementing agency(ies) was significant and could have been remedied. For example, work on the tertiary industrial waste treatment pilot did not result in plans for scale-up, even in the factory where it was tested. 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 establishment 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. After the MTR, Kenya was less successful than the other two countries in accelerating implementation due to systemic problems in the flow of funds and poor management of the project. The scale of operations was much lower in Kenya throughout the project period due to the chronic problems of management and flow of funds; 35 percent of GEF funds were disbursed in the last year alone. Targets and monitoring frameworks 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. Delays in accountability of funds were a universal problem that continued throughout the project. The continuing problems with financial management and procurement prompted a shift in the Secretariat to KARI and flows of funds improved, but new problems emerged. These factors could have been remedied by the implementing agency(ies).

#### *5.4 Costs and financing:*

The appraisal estimated project cost for Kenya was USD 28 million, with external financing, including an IDA credit of USD 12.8 million and a GEF grant of USD 11.5 million for the initial period of 1997-2002. By the end of 2002 only USD 12.65 million or about 52 percent of the total project budget had been utilized because of the slow progress in implementation. The IDA credit was closed in the end of 2002 and about USD 4.4 million was cancelled. Two extensions were approved for the GEF grant which closed December 2005, with 100 percent disbursed. As work programs within components were revised, resources were reallocated between and among them. 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 modest accomplishments of the first phase are likely to be sustainable and enhanced in the future due to the following:

Financial sustainability – The Government has made a commitment within the budget process to include activities initiated under the project in the budget projections and programs for its mainline agencies. The components with notable links included soil and water conservation and wetlands. 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 shift from the financial basis of the first phase (largely project-based and not fully included in the budget) 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 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 Kenya.

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 experienced in the first phase of embedding activities in the main ministries will be less problematical in the future. The Kenyan Ministry of Environment has acknowledged the shortcomings in performance of the project while it was under the Ministry's oversight and agreed to the transfer to KARI for the final period of implementation. The Ministry now actively seeks to lead Kenya's participation in the second phase, both in preparation and implementation, and has appointed a coordinator within the Ministry to lead that effort. KARI is eager to relinquish its present role and return to its core business of providing research to underpin improved agricultural practices that will serve the environment in the Lake Victoria basin. Because Kenya's contribution to the regional institutions is strong and the Ministry of Environment is showing commitment to resume responsibility for the Lake Victoria program under more promising circumstances than in the past, 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. 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 halted the over-abstraction and very likely avoided further and possibly irreversible damage, but the drop in level is nonetheless costly and highly undesirable. 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 allowing for subsequent actions in the second phase. 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 LVEMP activities allowing a continued momentum to be maintained till preparation of the next phase is complete. 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 ;” and will not be a linear continuation of activities and structures of the first. 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' funds. Possible GEF support will be dependent 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.

## **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 arrangements for implementation. Weaknesses in prior planning (especially of financial management and procurement ) translated into an effective delay of two and half years. The preparation team appears to have been overly optimistic about the capacity of the implementing agencies to perform. Because the project predated the substantial decentralization of staff and responsibility to the field, the weakness may have been hard for Washington-based staff to observe. Bank preparation missions in 1995 noted that the secretariats were up and running in the three countries, but the early pace of implementation demonstrated that they were operating with severe limitations. The changes introduced at the MTR allowed implementation in the other two countries to accelerate and much lost ground was recovered, although managerial problems persisted in Kenya. Given the elements of preparation that were strong and the subsequent correction of those that were weak resulting in improved performance in the program overall, the assessment of lending is moderately satisfactory.

#### *7.2 Supervision:*

**Moderately Satisfactory.** The chronology of the supervision record shows considerable variation over time in staffing, approach, and focus. Investment of bank budget in supervision was greater than in preparation, but 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). The supervision teams included specialists, staff and consultants with different areas of expertise (fisheries, watershed management, institutions etc.). The missions also 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 some improvement in 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. A strong but belated exercise to retrofit a logframe and monitoring indicators was undertaken 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 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 project in Kenya was subject to an Inspection Panel Request registered on November 22, 1999 submitted by RECONCILE (Resources Conflict Institute), a Kenyan NGO, acting for and on behalf of persons in the Nyanza Gulf area. RECONCILE was also the representative of OSIENALA (Friends of Lake Victoria), an NGO representing people living in Kisumu, and the Kenya Chapter of ECOVIC (the East African Communities Organization for Management of Lake Victoria Resources) who represented communities living along the Kenya side of Lake Victoria.

The Requesters claimed that they were likely to suffer harm as a result of failures and omissions by the Bank in the design and implementation of the water hyacinth mechanical chopping pilot of the LVEMP in Kenya, a small activity under the water hyacinth component. In particular, they claimed that the mechanical method for shredding the water hyacinth in the Lake and allowing it to sink to the bottom would result in ecological and environmental degradation which would, in turn, adversely affect communities living on the shores at the Nyanza Gulf. They also claimed that this method to control the water hyacinth was selected without a prior Environmental Assessment or appropriate community consultation.. The Board approved the Panel's recommendation for an investigation on March 20, 2000. The Panel sent its Investigation Report to the Board on December 28, 2000. The Inspection Panel concluded that Management was in compliance with OD 4.01. (Environmental Assessment) with respect to categorization of the Project, OD 4.15 (Poverty Alleviation) and OP 10.04 (Economic Evaluation of Investment Operations). The Panel also concluded that Bank Management was not in compliance with paragraph 42 of OD 13.05 on Bank Supervision specifically with regard to oversight of the mechanical chopping pilot.

Bank Management recommended six actions: (i) continued monitoring; (ii) vigilant surveillance; (iii) heightened community participation; (iv) cross country participation in supervision missions; (v) renewed activity of the Panel of Scientists; and (vi) possible repeat of the pilot. Bank management disagreed with the findings of the Panel with regard to adequacy of supervision, and provided evidence that supervision teams had brought to the attention of the project management issues that should have been addressed to improve the pilot. No request to repeat the pilot was received because the biological control of hyacinth was by that time considered to be a superior method.

The Inspection Panel request pertained to a small activity within one of the components. Although the mechanical chopping pilot was the explicit reason for the request, the larger context was one of heightened tensions at the time between civil society and the Government in Kenya, and the desire of civil society to be active and involved in projects. This desire was appropriate and constructive, and accommodated in the program through the recruitment of Community Development Officers (in place in Kenya in April 2000) and more broadly in the launch of the highly consultative Lake Victoria visioning exercise.

The supervision effort is judged to have been moderately satisfactory.

### *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 of the linked project in Uganda) and IEG (evaluation of the World Bank's Support for regional programs), which found overall Bank's performance 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 institutions and 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. Structural impediments to implementation, including coordination, capacity, and challenges regarding resource management were not adequately recognized and addressed. Preparation did not put in place adequate management structures that could provide strategic oversight and monitor and guide activities of the components. This was critical, given the lack of a detailed log-frame, and contributed significantly to the fragmentation of project activities. Significant weaknesses in pre-implementation operational planning, particularly related to disbursements, procurement and institutional coordination, resulted in a lack of readiness for implementation. These shortcomings were addressed in part through changes at the MTR, as noted above. The same reasoning that pertains to the assessment of the Bank's performance in preparation is operative for the Borrower's, and the overall assessment is moderately satisfactory.

#### *7.5 Government implementation performance:*

**Unsatisfactory.** Kenya shared with the other countries a lack of recognition of the general unreadiness of the various institutions and structural mechanisms to implement the project, but was not as successful as the others in remedying the situation. Systemic problems with flows of funds were not adequately addressed, and the Government neither assisted the implementing agencies to solve the problems nor held them accountable to do so. Despite ready evidence of unsuccessful performance on the part of the secretariat, the parent ministry did not take action for a long time, and then only with apparent reluctance and limited success. Policy measures important for the Lake Victoria agenda were slow to move. The Fish Levy is not yet operational. The Fisheries Bill is awaiting approval. The Forestry Policy was passed, albeit with significant delay, and this is a positive step.

#### *7.6 Implementing Agency:*

**Unsatisfactory.** There were eight main institutions/ministries, involved as primary implementing agencies in the projects in Kenya. As noted, implementation was slow and plagued with delays due to ineffective financial management and procurement processes. Tracking of financial flows and expenditures by categories and components has been inadequate. There was no proper hand-over between the secretariats and information pertaining to the earlier years is largely absent. Although KARI was expected to provide effective management given its record in other projects, this did not turn out to be the case. The financial management weaknesses of KARI included delays in funds disbursement and commingling of project resources with other accounts. The secretariat functioned as a coordination office with management of activities entirely under the implementing agencies. In the latter period, KARI considered itself more a mechanism for flow of funds with a weak mandate for coordination and technical management of the activities.

#### *7.7 Overall Borrower performance:*

**Unsatisfactory.** Despite Kenya's positive contribution to the design effort, the country's inability (both on the part of the Government and the implementing agencies) to address chronic weakness in management during implementation greatly weakened the entire effort of the three countries. The inability to extend the IDA credit and use the allocated amounts was a serious blow to the program. It is very fortunate that Kenya was able to retain the GEF resources to continue to participate in the regional activities, and the commitment to regional institutions within the EAC is noted. Despite these positive notes, the Borrower's performance overall was unsatisfactory.

## **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 lessons 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. For instance, the weak motivation for prioritizing waste water treatment pilots resulted from lack of regulations and/or enforcement.

***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 (with 41 percent of allocated resources). 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 research bodies). While the project upgraded skills and equipped institutions it did not project needs and address future gaps (there were long employment freezes in these countries with implications for capacity resulting from generational transitions). The timeline and intensity of capacity building has to be better managed to avoid lack of personnel to implement and scale-up.

***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). Moreover, in Kenya even contracted staff did not perform well in all cases, so the objective of the contracting was not met. 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 decision-making and lead to an increase in livelihood 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 aspects (sanitation and HIV/AIDS), micro-credit access and the socio-economic impacts of increasing 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.

## **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 In the joint SAR from (June 1996) the components were defined as (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 established to improve fisheries management, strengthen conservation and collaborate with other lake related agencies, coordinate fisheries extension and disseminate 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).

3) Fisheries Extension, Policies and Laws, and Fisheries Levy Trust (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 to support 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 better understand and eventually to 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 24.3 million and total project costs of USD 28.0 million for Kenya.

### **Revised Components**

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

	Component <i>Implementing Agency</i>	Sub-Components
1	Fisheries Management <i>Fisheries Department, Ministry of Livestock and Fisheries Development, Kisumu</i>	a) Frame Survey and Strengthening Statistical Data b) Co-Management (Law Enforcement) and Community Participation (Reflected the shift towards participatory resource management) c) Fish Quality Assurance (became a distinct sub-component) d) Training, Extension and Information Dissemination e) Fish Levy Trust Fund (it was incorporated into this component) f) Micro-Projects (this became a distinct sub-component)
2	Fisheries Research <i>Kenya Marine Fisheries Research Institute – KMFRI, Kisumu. Ministry of Livestock and Fisheries Development</i>	a) Fish Biology and Biodiversity Conservation b) Aquaculture c) Socio-economics d) Information and Database Establishment (Fish Stock Assessment supported by the EU)
3	Water Hyacinth Control <i>KARI, Ministry of Agriculture, Kisumu</i>	Water Hyacinth Control
4	Water Quality and Ecosystem Management <i>Ministry of Water and Irrigation, Kisumu</i> (Incorporated some activities of the Industrial and Municipal Waste Management Component. The remaining activities of that component were reduced/dropped off.)	a) Eutrophication Studies b) Hydraulic Conditions Pilot Study c) Sediment Characteristics and Sedimentation Pilot Study d) Lake Victoria Water Quality Model (became a distinct sub-component) e) Management of Pollution Loading (Point and Non-Point) (was originally in land use and wetland component) f) Role of Agro-chemicals Pilot Study (was originally in land use and wetland component) g) Integrated Tertiary Effluent Treatment Pilot

		Study (was originally a sub-component of the <i>Industrial and Municipal Waste Component</i> .)
5	Wetland Management <i>National Environment Management Authority - NEMA. Ministry of Environment, Natural Resources and Wildlife, Busia</i> (This was originally a part of the Land Use and Wetland Component, and became a full-fledged component)	a) Buffering Capacity of Lake Victoria Wetlands  b) Sustainable Use of Wetlands and Wetland Products
6	Soil and Water Conservation <i>Ministry of Agriculture, Kericho</i>	(This was originally a pilot of the Land Use and Wetland Component, and became a full-fledged component)
7	Catchment Afforestation <i>Forestry Department Ministry of Environment, Natural resources and Wildlife, Eldoret</i>	(This was originally a pilot of the Land Use and Wetland Component, and became a full-fledged component)
8	Capacity Building/Support to Riparian Universities <i>School of Environmental Studies. Moi University, Eldoret</i>	(This was originally a sub-component of the Institutional Framework Component, and became a full-fledged component)
9	Coordinating National Secretariat Originally, <i>Ministry of Environment and Natural Resources</i> , later shifted to <i>KARI HQ</i> with a <i>Coordinating Secretariat at Kisumu</i> .	(This was originally a sub-component of the Institutional Framework Component)

### **Component Specific 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.*

The component, implemented by the fisheries department had 7 sub-components with a focus on co-management, monitoring and establishing an information baseline. Outputs include: (i) A fisheries synthesis report. The report was prepared to capture information gathered under this component and was assessed as superficial in many areas and as not fully capturing the activities of the project. (ii) A functional database (3 frame surveys were conducted, 2000, 2002 and 2004, the former two being regionally harmonized). Data show that high pressure has been observed in areas with high species diversity, a worrisome trend. (iii) 245 Beach Management units are functional (Kaloka being a star example)- of which 40 regulate according to new fishing methods and enhanced management measures promoted by the project. (iv) 98 of 113 identified fish breeding grounds were gazetted and are being protected by local communities. (v) While a 31 percent reduction in the number of fishers operating in Kenya since 2002 was observed. A notable reduction in illegal fishing methods/gears has been observed. (vi) There is a move towards collecting information through the BMUs and training to local communities and officials has been provided. (vii) Aquaculture extension was conducted. There were several scientific experiments and studies in aquaculture with limited outputs. (viii) 64 of 69

microprojects (targeted 80) in health, water, sanitation and roads/bridges were operational. (ix) Post-harvest losses were substantially reduced (from 20 percent in 1997 to about 5 percent in 2005). (x) Fish quality assurance and fish testing since 1999 resulted in the lifting of the EU ban on fish imports from the Lake, an outcome of the strengthening of the fish quality laboratory in Kisumu with equipment and improved procedures. Fish quality standards and codes have also been harmonized across the three countries. (xi) Regional harmonization for the fish levy trust has been approved by the RPSC and is likely to be operationalized under the fisheries development authority bill.

#### Fisheries Research

*Objective: Establish a baseline on ecology of the lake, impact of environmental factors on the lake system and socioeconomic impact on resources; restoration of threatened species through aquaculture*

This component had three components covering research in fish biology and biodiversity, aquaculture, socio-economics and a supporting information and database component.

The outputs included: (i) A biodiversity baseline was compiled based on surveys in the main and some satellite lakes; (ii) A comprehensive bibliography was prepared (iii) An biodiversity atlas was prepared but not published; (iii) Two regional compendia on fish biology and ecology were prepared but not published; (iv) 31 papers or relevant documents produced; (v) Contribution to the fisheries policy; Fisheries act amended; (vi) Threatened species identified and stocks collected; (vii) National aquaculture manual and fact sheets for fish-farming produced and four demonstration sites were established; 50 operational fish ponds; (viii) Four qualitative baseline survey assessments completed (nutrition, microprojects, fisheries sector contribution to welfare, degradation of fisheries/environment); (ix) An Information center services provided for facilitating research was established.

#### Water Quality and Ecosystem Management

*Objective: To elucidate the nature and dynamics of the lake ecosystem; to improve management of industrial and municipal effluent and assess the contribution of urban run-off of lake pollution in order to design alleviation measures.* The following outputs have largely been delivered, in addition to staff training at various levels):

a) Eutrophication Studies: Regional harmonized water quality monitoring network determined and baseline have been established (lake and catchments, 60 functional stations); functioning operational water quality analysis laboratory exists; the P/N ratio and phytoplankton distribution in the lake is established; some obvious pollution reduction management measures were identified, but approaches to implementation have not been developed.

b) Hydraulic Conditions Pilot Study: Study on hydraulic characteristics in the channel between the Winam Gulf and the open lake was undertaken by a consultant (CWR, University of Western Australia). Three staff were trained in Australia in use of the Estuary and Lake Computer Model (ELCOM) hydraulic model, used in the study.

c) Sediment Characteristics and Sedimentation Pilot Study: Sedimentation rates at the mouth of Nyando and Nzoia rivers and in-lake were established; analyses of sources of sedimentation were done; three sensitization workshops were conducted.

d) Lake Victoria Water Quality Model: Test-run of hydrodynamic module in the model was undertaken; introductory training in Delft University/IHE (The Netherlands) was undertaken. The lack of proper data series, need for further modelling and the low level of training have made the model unusable as a tool for management decisions at present.

e) Management of Pollution Loading (Point and Non-Point): Monitoring network in main river catchments was established; quantification and characteristics of river water quality was established with pollution hotspots identified (see g) below, covering towns with more than 10,000 inhabitants; atmospheric deposition monitoring network was established and assessment was undertaken.

f) Role of Agro-chemicals Pilot Study: Survey and stocktaking of agro-chemicals use in one catchment (Nyando) was carried out; trends of the use of agro-chemicals was established through repeated surveys; health impact awareness training amongst farmer/users was conducted.

g) Integrated Tertiary Effluent Treatment Pilot Study: This sub-component changed name during the course of the project. The core project *Industrial and Municipal Waste Management and Priority Waste Management* Investments was intended to directly address some of the pollution problems, where interventions and technologies were identified. The investments to upgrade the Kisumu wastewater treatment plant (WWTP) were deferred when it became likely that the IDA credit would not be extended and needed institutional changes could not be undertaken in time to allow completion of the investment prior to closing of the credit. The tertiary treatment of the municipal wastewater consequently did not materialize, as this was an add-on treatment to the Kisumu WWTP. An inventory of point sources of wastewater pollution (industry and municipal, including GPS positioning) was carried out with quantities and characteristics of discharges assessed; introductory seminar on cleaner production (CP) approaches in selected industries was undertaken (but no CP course was held); the Tertiary Industrial Treatment Pilot study was carried out by a PhD student at Pan African Pulp and Paper factory, and the pilot is still used for demonstration (mostly to students) but was not scaled up to address the total factory effluent discharge.

#### Water Hyacinth Control

*Objective: To establish sustainable long-term capacity for maintaining control of water hyacinth and other invasive weeds in Lake Victoria.* Water Hyacinth infestation has been reduced dramatically to biological equilibrium levels by approximately 85 % of the previous levels, using multiple control mechanisms, mainly biological (weevils and moths) and manual extraction (near critical infrastructure). The component established 18 weevil rearing units, of which 17 are functioning today (15 at schools and 2 in BMUs). An assessment was done enabling the component to target hotspots in the lake. A total of 85 community members trained and four persons graduated with advanced degrees (two PhDs and two M.Sc). Notably, this component used satellite photography and other tools to assess infestation in a more cost-effective way than on-lake monitoring. This approach was not undertaken by the other two countries. The use of schools (demonstration and as science related teaching tools) and communities (mainly fishing communities) has improved the sustainability of these activities.

#### 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.*

There was one core sub-component and one pilot, buffering capacity and sustainable use of wetland products, respectively complementing each other. The main outputs are as listed: National Wetlands map produced; Characterized wetlands ability to clean wastewater (Demos at Marula Swamp, Eldoret and Dionosoiyet, Kericho); The LVEMP research has been feeding into Wetlands Policy, which is now in a draft version in the Cabinet, as of August 05; A market survey covering 24 markets in four districts on three product categories (clay & plant products and fish); A number of capacity building activities undertaken (TV documentaries, posters, brochures, pamphlets and multiple barazas); Training of 48 local craftsmen in product quality improvement, financial management and marketing of wetlands products. The activities carried out by the component have to some extent been hampered by the lack of internet access in the premises of the component. Dominion Farms have started to drain a section of the Yala Swamp in order to turn it into agricultural land, by cutting of the inflow to the wetland (but still diverting some water to parts of the swamp). Eventually this could lead to an irreversible situation.

### 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.*

The component implemented by the Ministry of Agriculture covered four districts, targeting parts of the Nyando, Yala and Nzoia drainage basins. It was based on a micro-catchment scale participatory approach that targeted critical watershed issues, by working with the community based institutions (catchment committees) to develop community action plans (CAPs) for better land use practices. Among its key outputs are: (i) Participatory extension - planning of 7355 farms of which 60 % implemented; supported development of common interest groups; (ii) 189 PRA reports, CAPs and Resource maps; (iii) 756 farmer and district committee members trained; demand driven training of 58 common interest groups, 278 farmers exchange visits; (iv) Microproject community investments including 275 kms of conservation structures, 29 fruit/tree nurseries, 15 protected springs, 7 water pans/storage structures constructed; (v) Enhanced community capacity in soil and water conservation (with 30-45% female participation). The component collaborated with other institutions and initiatives (such as the University of Nairobi, Moi University, Tea Research Foundation of Kenya, Kenya Soil Survey of KARI - Nairobi, and KARI-Kibos, Kisumu) in conducting five research studies. This component also chaired a collaborative effort with other components (catchment afforestation, wetlands, water quality-management of pollution and agro-chemicals subprograms) in the Nyando, Yala and Moiben Rivers' Catchments.

### Catchment Afforestation

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

Outputs include: 5 micro projects (one beekeeping, one fish farming, two nursery expansions and one spring water protection); 1.2 million seedlings produced annually throughout the project period; 100 seedling nurseries were active at project closure in December 2005, 25 are foreseen to be able to sustain their activities and become autonomous; areas identified for afforestation or re-forestation; 18 springs protected (benefiting 40 households); raised awareness about environmental protection; 131 hectares of trust land was afforested or re-afforested. Unfortunately there is no mention of the survival rate of the 1.2 million tree seedlings produced annually or how many of the afforested hectares are being sustained.

### Capacity Building - Support to Moi University, Department of Fisheries and School of Environmental Sciences

*Objective: To strengthen facilities for environmental analysis and graduate teaching at Moi University (School of environmental Studies, Department of Fisheries)*

Capacity building (coordinating the training and capacity enhancement of component staff) and strengthening of the institutional capacity of Moi University School of Environmental Sciences and Fisheries Department took place. Graduates included three M Phil, one D Phil and 224 short course participants, including farmers. Facilities were strengthened - 46 operational fish ponds used for research and demonstration for community training, support to laboratory operations provided.

### Institutional Framework - National Secretariat

The national secretariat was originally under the Ministry of Environment, Natural Resources and Wildlife, reporting to the Permanent Secretary of the ministry. The secretariat office was located in Nairobi at the ministry headquarters and later moved to Kisumu in 2001/02 to be nearer the project operations, partly staffed by seconded ministerial staff and contract staff. At the end of 2002, the whole

Secretariat was dismissed. Kenya Agricultural Research Institute was then made the coordinating agency. The transition was far from smooth and the new KARI secretariat was only able to come on board in late 2003. This secretariat functioned strictly in a coordinating role and implementation was managed by the components.

#### Micro-projects and Community Participation

Guidance principles for community participation were prepared. NGOs were brought in to provide communities with training. Gender considerations were introduced and a gender strategy was developed. HIV/AIDS was a key issue in the operational areas and the project supported various initiatives such as community awareness raising, dissemination of information, inclusion of affected persons in community groups supported by the project. Many initiatives for awareness and information dissemination were conducted including Lake Victoria Day (annually for four years), use of media (radio, TV/ development of documentaries) in local languages etc. A beneficiary assessment was also conducted. The project met and exceeded the originally targeted 60 micro-projects by implementing 81 in all, of which 80 are functional.

<b>Table 1: Beneficiary concerns addressed directly and indirectly by micro-projects classified by thematic area</b>										
	Access road	Beach sanitation	Bridge	Cold storage	Fish farming	Health facility	Tree/Tea nursery	Water supply	Wetland products	Grand Total
<b>Directly</b>										
Health		2				14	2	4	1	<b>23</b>
Water		1				2	2	6	1	<b>12</b>
Sanitation		3				7		1		<b>11</b>
IGAs	1			1	1	1	2	3	2	<b>11</b>
Cold room				1						<b>1</b>
Afforestation and soil Conservation							5	2	1	<b>8</b>
Infrastructure development	1	2	1	1		7		3		<b>15</b>
Wetland products								1	2	<b>3</b>
Food production & security (Fish farming)					1		2		1	<b>4</b>
Food production & security (Beekeeping)							2			<b>2</b>
<b>Indirectly</b>										
Health	1		1				4	2	2	<b>10</b>
Water						3			1	<b>4</b>
Sanitation						1		2		<b>3</b>
IGAs	1	3	1		1	1	5	3	2	<b>17</b>
Cold room										
Afforestation and soil Conservation						1			1	<b>2</b>
Infrastructure development										
Wetland products										
Food production & security (Fish farming)		1				1	1	1		<b>4</b>
Food production & security (Beekeeping)							2			<b>2</b>

### **Institutional Development**

**Fisheries Management** There has undoubtedly been an increase in capacity, both institutional (for example, the LVFO) and infrastructural (such as the fish laboratories) to aid in developing future management interventions. There has been considerable increase in community awareness and skills through the co-management approach (BMUs).

**Fisheries Research**. The focus of the component was on strengthening research capacity and its institutional development impact is substantial.

**Water Quality and Ecosystem Management Component** The component has increased the knowledge of the component staff regarding overall sedimentation and eutrophication characteristics in the Winam Gulf, the hydraulics mechanism between the Gulf and the lake, and the establishment and running of monitoring networks (in the catchment and the lake).

**Water Hyacinth control**. The capacity built through the Ph.D. and M.Sc. degrees along with the short courses undertaken by project staff will be part of KARI continuous development. The use of schools and communities as local institutions in water hyacinth control has contributed to their capacity.

**Wetlands Management** The four M.Sc. graduates are still employed in NEMA, which ensures that the

knowledge gained have not been lost and will be able to continuously develop NEMA's institutional capacity within wetlands management. The initiated work on the model for the wetlands buffering capacity has not been successfully completed due to lack of capacity.

Soil and Water Conservation There has been considerable capacity built in the institutions. Community empowerment and the micro-projects approach also contributed to considerable strengthening of local initiatives in soil and water. Four staff trained at the masters level and 53 short courses, radio programs in Luo and Kalenjin, eight regional tours. Also the experience of the component has provided many opportunities for development and fine-tuning of strategies in dealing with land degradation through community-based activities.

Catchment Afforestation Five M.Sc. have been sponsored under the component leading to an upgrading of skills level in the MENR, which has positively impacted the ministry's human resource capacity. It is hoped that this capacity can contribute to the new agenda facing the institution (under the new Forest Act).

Capacity building in the Riparian Universities. There was an increase in the numbers of graduating students. Moi university also participated in some research conducted by the components.

National Secretariat. The secretariat coordinating for most of the project period (in MENR) was disbanded and the hand-over to KARI was problematic. The following coordinating secretariat office in Kisumu has been closed at the end of the project and the assets transferred to MENR, the coordinating agency for the Bridging phase. However, the experience of coordinating such a large project and the knowledge on the various issues pertaining to the lake hopefully remains with KARI.

Microprojects and community participation. These activities helped increase buy-in among the communities, raise awareness on the critical environmental issues and help empower communities. Microprojects, in general, were successful and highly demanded; it was commendable for its integrated approach towards the addressing of multiple needs of the communities, that also ensured the sustainability of these activities.

## **Sustainability**

Fisheries Management. The project helped lay the base for more intensive management but will need continued support. Operationalization of the Fish Levy Trust is essential.

Fisheries Research. The research and information gathered will remain after the project. The surveys would need to ongoing support to be continued. Some study surveys are unlikely to be replicated. Those outputs that have not been published or disseminated in a usable format may become less useful.

Water Quality and Ecosystem Management. While the monitoring of water quality in the lake and the catchment will not continue at the intensity that was done during the project due to lack of funds it is likely to continue during the Bridging Phase. A critical issue is the need for the intensity level to be determined based on a scientific need and in a cost-effective way.

Water Hyacinth Control. There is no income generation associated with running of the weevil rearing units and continued public support will be needed. Nevertheless, the units situated at schools are likely to be sustained as they so far have been part of the science educational program. The need to continue to train and keep the school contacts updated is central to the continuing success. The cost of a core monitoring and weevil rearing program is not very high (USD 60,000) and is likely to have considerable long-term economic, environmental and institutional benefits. Institutional support for these activities is likely to continue give the need to keep water hyacinths to a non-nuisance level.

Wetlands Management. The components activities have been implemented through NEMA. Hence some of the strategic activities will carry on in one or the other way under that agency. But it is unlikely that all the local community embedded activities will carry on, only the ones being financially viable will survive. The communities closer situated to the component headquarters have benefited more from the technical backstopping, giving them an advantage and higher likeliness to sustain their



activities than the community groups situated further afield. There has been considerable build-up empowerment and building of community capacity through such activities. Rich experience has been gained by communities involved in the production and marketing of the wetland product based handicrafts.

Soil and Water Conservation. The participatory approach and the effort to build developing institutional structures at the community level (common interest groups) are likely to yield results in terms of sustainability. It is clear that the land use management activities that have demonstrable benefits perceived by the farmers are those likely to last. This is a critical factor that needs to be considered during planning of any scaling up. Often, even the farmers who share a strong preference for conservation measures are reliant on project based inputs and funding. The mission observed that many of the stakeholders at the community levels (farmers, district officials) believe and associate the sustainability of project activities with continuing financial support.

Catchment Afforestation. The market for tree seedlings was weakly developed with the bulk of demand coming from the project. It is expected that the participating communities will appreciate the environmental benefits at a subsequent stage. The communities that undertook a diversified range of activities (combining nursery management with, for instance, beekeeping, horticulture, fish farming and other activities) have a higher likelihood of sustaining its returns after project closure. All activities were tied to the Department of Forestry, which increases the likelihood of some parts of the component being mainstreamed into the forestry department, but will be dependent on the resources available to the institution.

Capacity Building: Support to Riparian Universities. A few of the aquaculture activities are likely to bring in some funds. However they will not be sufficient to continue the capacity building and training program that was conducted during the project. The project supported an increase in the number of graduating students but that intensity of effort declined towards the end of the project.

Institutional Framework: National Secretariat. The secretariat at Kisumu has been closed with staff distributed among other KARI projects. Assets have been/are being transferred to the Ministry of Environment and Natural Resources which is the implementing agency for the bridging phase of the project. The information and capacity of the staff who worked on this project who continue with KARI, may remain.

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.	Universities – achieved to some degree Line ministries – achieved to some degree (project staff only) Secretariats – achieved to some degree Communities – achieved in pilot areas 3 MSc graduated 1 Phd rewarded 224 persons attended 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.
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 Fisheries Bill 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. The environmental standards especially concerning wastewater discharges and pollution/water quality have not been standardized, and the “polluter-pays” principle has not been accepted across the region; enforcement lax.
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.
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 245 active Beach Management Units (BMUs) progressing. Illegal fishing reduced in all countries.	Community Conservation Units need further strengthening.
5. Establishing sustainable long-term capacity for management	Biologically sustainable control of water hyacinth achieved (85%	Different locations for the weevil rearing stations were used,

and control of water hyacinth and other invasive weeds in Lake Victoria Basin, through integrated weed control methods and community involvement	reduction); Strong community involvement in control activities.	including schools, fishing villages etc., based on the incentives perceived by 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 episodic. 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. National wetlands maps and wetland inventory available in all countries. and classification of Lake Victoria wetlands; maps produced; Cost benefit analysis of wetlands produced.	More comprehensive wetland management plans were developed for a few pilot areas, using a participatory approach.

## Annex 2. Project Costs and Financing

The IDA credit was closed in 2002 with 70 percent disbursed. The secretariat of the project was shifted from the Ministry of Environment to KARI. Financial Management Tracking was very weak with poor handover between Secretariats. Information on expenditure by components is therefore available only for 2003-2005 when the secretariat was shifted to KARI.

**Table 1: LVEMP Regional - Project Financing Plan at Appraisal (USD, millions, all three countries)**

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

**Table 2: LVEMP Kenya - Project Costs Estimates (by component and financing source) at Appraisal**

Components (in USD, '000)	Appraisal Estimates (in SAR)					
	IDA	GEF	IDA+GEF	GoK	Total	Percent
Fisheries Research	1149.00	3107.00	4256.00	473.00	<b>4729.00</b>	18%
Fisheries Management	4719.00		4719.00	524.00	<b>5243.00</b>	19%
Water Quality Management		2881.00	2881.00	320.00	<b>3201.00</b>	12%
Industrial and Municipal Waste Management	3621.00		3621.00	569.00	<b>4190.00</b>	16%
Water Hyacinth Control	1005.00	1508.00	2513.00	279.00	<b>2792.00</b>	10%
Wetland Management	262.00	1411.00	1673.00	186.00	<b>1859.00</b>	7%
Land use (incl. pollution loading and agro-chemicals assessment)	811.00	1386.00	2197.00	244.00	<b>2441.00</b>	9%
Catchment Afforestation	995.00		995.00	111.00	<b>1106.00</b>	4%
Support to Riparian Universities		351.00	351.00	39.00	<b>390.00</b>	1%
Cordinating Secretariat		869.00	869.00	97.00	<b>966.00</b>	4%
<b>Total</b>	<b>12562.00</b>	<b>11513.00</b>	<b>24075.00</b>	<b>2842.00</b>	<b>26917.00</b>	<b>100%</b>

**Table 3: LVEMP Kenya: IDA Credit and GEF Grant - By Expenditure/Disbursement Category**

in USD '000	IDA			GEF		
Category	Allocated	Disbursed	Undisbursed	Allocated	Disbursed	Undist
Civil works	1,520.35	1,586.36	-66.01	502.00	264.28	
Vehicles and Equipment	2,085.39	2,085.39	0.00	2,284.00	1,763.72	
Consultant Services and Training	2,424.65	2,424.65	0.00	4,084.00	4,562.45	
Goods, Works, Services	723.27	1,221.81	-498.54	0.00	0.00	
Operating Costs	1,519.40	1,519.40	0.00	4,372.00	4,495.92	
Unallocated	553.45	0.00	553.45	233.00	0.00	
Special Account	0.00	-11.10	11.10	0.00	0.00	
<b>Totals</b>	<b>8,826.51</b>	<b>8,826.51</b>	<b>0.00</b>	<b>11,475.00</b>	<b>11,086.37</b>	

**IDA Credit****Signed amount: USD 13,137.023.00****Disbursed: USD 8,826,513.98****Cancelled USD 4,310,509.02****Table 4: LVEMP Kenya: GEF Grant - By Component Expenditures (2003-05, earlier data not available to ICR mission)**

Component, USD '000	Planned	Actual	Planned (%)	Actual (%)
Fisheries Management	632.24	428.87	12	6
Fisheries Research	877.59	545.63	16	7
Water Quality	2,249.40	3,522.69	42	47
Water Hyacinth	246.56	327.91	5	4
Wetlands	403.15	538.16	8	7
Soil & Water	192.88	176.50	4	2
Catchment Afforestation	246.64	404.60	5	5
Capacity Building	146.75	188.20	3	3
Coordination	359.01	1,361.10	7	18
<b>TOTAL</b>	<b>5,354.21</b>	<b>7,493.65</b>	<b>100</b>	<b>100</b>

### Annex 3. Economic Costs and Benefits

A standard ERR was not estimated in the SAR, as is often the case when a significant focus of the project is on capacity strengthening and institutional reform. The section below provides some indicative socio-economic data and a discussion of observed benefits, corresponding to the potential benefits presented in the SAR.

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 the duration of the project has increased from 25 million to an estimated 30 million people, while general standards of living are between USD 90-270 per capita per annum (based on national figures). It is estimated that fisheries contribute about 5 percent to the Kenyan economy. In Kenya, the population in the lake basin is young and constitutes 40 percent of the total for the country. The population density is 320 persons per square Kilometer. The quality of the environment and the status of the natural resources are critical for maintenance and growth of incomes and reduction of poverty.

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.

Fisheries contribute about three percent of the GDP of the riparian countries. 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. It is estimated that a majority of this production is artisanal fishery. Figures for Kenya on the gross employment in the sector are not available. Currently exports of Nile Perch from all three countries are estimated at USD 270 million. The Nile perch products are exported to Europe, Australia, Asia, Africa and America. Kenya's share of this market is estimated at about USD 57 million (2004).

The EU ban in 1999 resulted in a sudden decline in values received from exports of Nile Perch to the EU. The ban was motivated by concerns that fish and fishery products were contaminated by pesticides. While in terms of quantities, exports did not substantially decline, as Israel and other markets made up for the difference, the value received was not commensurate. If the EU ban had continued with the same level of exports, and assuming that 70 percent of the difference in values was made up through price increases in other markets (with 5 percent inflation), a rough estimation of avoided losses in the period 2000-2003 is **USD 26 million**, while the cost of upgrading the fish quality laboratory was in the range of USD 500,000.

The National ICR estimates that sustaining export earnings at the present level would therefore preserve export revenues with a present value of US \$200 million for Kenya.

Data have not been collected for a sufficient time to accurately estimate the Maximum Sustainable Yield (MSY) and there have been disagreements between Tanzania, Kenya, and Uganda regarding the estimates. The Tanzania National Fisheries Synthesis Report estimates MSY for the Lake to be about 348,184 tons from the acoustic survey and 220,000 tons from the trawl surveys (1999 – 2002 surveys). Fish prices have been stable during the period of late nineties and early 2000's at around one dollar.

The fishing industry is affected by several problems such as the disappearance of indigenous fish species, eutrophication, illegal fishing practices, increasing fishing effort, encroachment in the fish breeding areas.

The SAR estimated that the impact as a result of the spread of water hyacinth, including costs of 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 be about USD 6-10 million per annum. The water hyacinth infestation has been reduced to non-nuisance levels. Indicative avoided costs range between USD **25-40 million** in the period 2000-2005 for the whole lake. Estimates from the national ICR put the present value of avoided costs for Kenya at US \$ 8 – 13 million. (see below)

Appendix: National ICR estimates of Economic returns.

**1. Fisheries**

A major purpose of the project was avoidance of the predictable collapse in the fisheries. The current fish export value is US \$ 55.4 million (KShs 4.1 billion). Export value of uncontrolled fishery estimated at 50% of the current production, or US \$ 27.7 million. Assuming the current level of exports will be sustained, the present value of this revenue stream at a discount factor of 12 % starting from year 1 is:

Export value of present fishery (sustained)	US \$ 55.4 million
Export value of uncontrolled fishery	US \$ 27.7 million
Difference	US \$ 27.7 million

Present value at 12% discount factor is US \$ 226.7 million.

Sustaining of export earnings at the present level would therefore preserve export revenues with a present value of US \$ 0.2 billion.

The local communities will also benefit from local consumption of fish estimated at US \$ 1 million per annum (3% of total fish catch other than Nile Perch). In addition to the local fishermen, boat owners, and fish marketers will benefit through value adding activities estimated at US\$ 72 million per annum.

**2. Water Hyacinth Control**

The project has achieved notable progress under this component. Water hyacinth coverage has reduced by 80-90% from 17,000 ha to about 4,000ha presently. Consequently, a wide range of benefits have accrued to the lake community. Some of these are:

- (a) Faster commercial waterborne transport of people and goods;
- (b) Reduced fishing time as the beaches are not blocked;
- (c) Reduction of time taken to fetch water as a result of increased access to traditional water collection areas;
- (d) Increased agricultural output as a result of increased small-scale irrigation; schemes due to opening of pipes and channels that were previously covered by hyacinth;

Using data from studies carried out in the project area, we estimate that the total cost saving attributable to water hyacinth is US \$ 2 –3 million per annum with a present value of US \$ 8 – 13 million.



## 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
<b>Identification/Preparation</b>					
10/21/1992	1	1 TASK TEAM LEADER			
3/1/1993	2	1 TASK TEAM LEADER, 1 INSTITUTIONAL DEVELOPMENT OFFICER			
4/27/1994	2	1 TASK TEAM LEADER, 1 INSTITUTIONAL DEVELOPMENT OFFICER			
6/14/1994	2	1 TASK TEAM LEADER, 1 INSTITUTIONAL DEVELOPMENT OFFICER			
7/29/1994	2	1 TASK TEAM LEADER, 1 INSTITUTIONAL DEVELOPMENT OFFICER			
10/9/1994	2	1 TASK TEAM LEADER, 1 INSTITUTIONAL DEVELOPMENT OFFICER			
2/11/1995	2	1 TASK TEAM LEADER, 1 INSTITUTIONAL DEVELOPMENT OFFICER			
5/26/1995	2	1 TASK TEAM LEADER, 1 INSTITUTIONAL DEVELOPMENT OFFICER			
<b>Appraisal/Negotiation</b>					
12/01-22/1995					
05/20-22/1996					
<b>Supervision</b>					
11/08/1997	7	TASK TEAM LEADER (1); MONITORING (1); PROCUREMENT (1); PARTICIPATION (1); NGO OFFICER (1); INFO. TECH. ANALYST (1); COMMUNICATIONS (1)	S	S	
05/09/1998	5	TASK TEAM LEADER (1); CO-LEADER (1); PARTICIPATION (1); LIMNOLOGY (1); NGO OFFICER (1)	U	U	
06/16/2000	6	WATER HYACINTH CONTROL (1); TEAM LEADER/FISHERIES (1); WATER/BIODIVERSITY (1); FORESTRY/MICROPROJECTS	U	U	

	05/15/2001	6	(1); HIV/AIDS (1); FINANCIAL MANAGEMENT (1) OUTGOING TTL (1); NRM SPECIALIST (2); FISHERIES SPECIALIST (1); SOCIAL DEV. OFFICER (1); INCOMING TTL (1)	S	S
	6/10/2002	7	TASK TEAM LEADER (1), PROCUREMENT SPECIALIST (1), FINANCIAL MANAGEMENT SPECIALIST (1), SOCIAL DEVELOPMENT SPECIALIST (1), ENVIRONMENT SPECIALIST (1), CONSULTANTS (2)	U	S
	4/12/2004	5	LAND AFFORECTATION (1), MICRO PROJECTS,WETLANDS (1), FISHERIES, WATER QUALITY (1), FINANCIAL MANAGEMENT (1), PROCUREMENT (10)	S	S
	9/27/2004	7	TEAM LEADER (1), MICRIPROJEDTS, WETLANDS (10, FISHERIES (1), LAND MANAGEMENT AFFORESTATION (1), PROCUREMENT (1), FINANCIAL MANAGEMENT (1), CAPCITY BUILDING	S	S
<b>ICR</b>	April 17, 2006	3	TASK TEAM LEADER/ENVIRONMENT AL ECONOMIST (1), ENVIRONMENTAL SPECIALIST/INDEPENDE NT CONSULTANT (1), GEF SPECIALIST/OBSERVER (1)	U	U

(b) Staff:

Stage of Project Cycle	Actual/Latest Estimate	
	No. Staff weeks	US\$ ('000)
Identification/Preparation	n.a.	104*
Appraisal/Negotiation	n.a.	*
Supervision	59**	718
ICR	4	57
Total	n.a.	879

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)

	<u>Rating</u>				
<input type="checkbox"/> <i>Macro policies</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input checked="" type="checkbox"/> <i>Sector Policies</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input checked="" type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Physical</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Financial</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input checked="" type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Institutional Development</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Environmental</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<i>Social</i>					
<input checked="" type="checkbox"/> <i>Poverty Reduction</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Gender</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input checked="" type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Other (Please specify)</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Private sector development</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input checked="" type="checkbox"/> <i>Public sector management</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Other (Please specify)</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA

## Annex 6. Ratings of Bank and Borrower Performance

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

### 6.1 Bank performance

	<u>Rating</u>			
<input checked="" type="checkbox"/> Lending	<input type="radio"/> HS	<input checked="" type="radio"/> S	<input type="radio"/> U	<input type="radio"/> HU
<input checked="" type="checkbox"/> Supervision	<input type="radio"/> HS	<input checked="" type="radio"/> S	<input type="radio"/> U	<input type="radio"/> HU
<input checked="" type="checkbox"/> Overall	<input type="radio"/> HS	<input checked="" type="radio"/> S	<input type="radio"/> U	<input type="radio"/> HU

### 6.2 Borrower performance

	<u>Rating</u>			
<input checked="" type="checkbox"/> Preparation	<input type="radio"/> HS	<input checked="" type="radio"/> S	<input type="radio"/> U	<input type="radio"/> HU
<input checked="" type="checkbox"/> Government implementation performance	<input type="radio"/> HS	<input type="radio"/> S	<input checked="" type="radio"/> U	<input type="radio"/> HU
<input checked="" type="checkbox"/> Implementation agency performance	<input type="radio"/> HS	<input type="radio"/> S	<input checked="" type="radio"/> U	<input type="radio"/> HU
<input checked="" type="checkbox"/> Overall	<input type="radio"/> HS	<input type="radio"/> S	<input checked="" type="radio"/> U	<input type="radio"/> HU

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

Bank Lending **Moderately Satisfactory**

Bank Supervision **Moderately Satisfactory**

Borrower Preparation **Moderately Satisfactory**

Government Implementation **Unsatisfactory**

Implementing Agencies **Unsatisfactory**

## **Annex 7. List of Supporting Documents**

1. World Bank. Project Appraisal Document on a Proposed Credit in the Amount of SDR8,900,000 to the Republic of Kenya, Report No. 2907. 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. Lake Victoria Environmental Management Project, Phase 1, Policy And Institutional Framework, KENYA, Draft, Stocktaking Report, July, 2003
6. World Bank. Aide-Memoirs' from Project Identification Mission in 1992 to last Supervision Mission in December 2005. Washington D.C.
7. World Bank. Lake Victoria Environmental Management Project, Supplemental Credit, Report No.P7519, June, 2002
8. World Bank. Poverty Reduction Strategy Paper (PRSP) and joint assessment, Report No.28524, May, 2004
9. World Bank. Kenya - Country Assistance Strategy, Report No. 29038, May 2004
10. World Bank. Kenya - Country Assistance Strategy, Report No. 18391, September 1998
11. World Bank. Kenya - National environment action plan, Report No. E92, June 1994
12. World Bank, Implementation Completion Draft Report, Dr. Paul N. Mbatia, Consultant, Nairobi, December 2005 Implementation Status and Results Implementation Status and Results World Bank. Policy and Institutional Framework, Draft, Stocktaking Report, July, 2003
13. World Bank. Development Credit Agreement No. 2907-KE, Washington, DC, September 1996
14. World Bank. GEF Trust Fund Grant Agreement No. 23819, Washington, DC, September 1996
15. World Bank. Management Report and Recommendation in Response to the Inspection Panel Investigation Report, Water Hyacinth Chopping Pilot Activity, Report No.21781, IDA Credit 2907-KE, GEF TF23819, January, 2001
16. World Bank. Transboundary Diagnostic Analysis and Strategic Action Program Development for the Lake Victoria Basin Project, Report No. 29872, March 2004
17. World Bank. Report and Recommendations on Request for Inspection on Kenya Lake Victoria Environmental Management Project, IDA Credit 2907-KE, GEF TF23819, October – November 1999
18. World Bank. Inspection Panel Investigation Report No. 28219, December, 2000
19. World Bank. Knowledge and Experiences gained from managing The Lake Victoria Ecosystem, 2005
20. World Bank/UNEP. Discussion Paper on Regional Program for Environmental Management of Lake Victoria, November, 1992
21. World Bank. Back To Office Reports for. The Lake Victoria Environmental Management Program (FY1994) Project ID: P040551 –Loan/Credit No.2907-KE). Washington D.C.
22. 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
23. World Bank. Implementation Completion Report, Lake Victoria Environmental Management Project, Period July 1997 – December 2005, Draft Final Report, December, 2005
24. Full reference for the national implementation completion reports
25. 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.
26. Regional Synthesis report for Water Quality - Full reference

27. National Synthesis report on fisheries Management and Fisheries Research, Final Report, Kenya, 2005
28. National Synthesis report for Water Quality- Full reference
29. Lessons learned Report on the Institutional Framework, Mr. Mathenge Ichang'I, August 2005
30. Lessons Learnt From Land Use Management Through Integrated Soil And Water Conservation, Prof. Elijah K. Biamah, October 2005
31. Lessons Learnt on Micro Projects, Lorna Grace O. Okotto,
32. National Lessons Learnt Consultancy on Wetlands Component Activities, Phillip Raburu, Ph.D. Eldoret, Kenya, June, 2005
33. Lessons Learnt Report on the Capacity building Component of MOI University – School of Environmental Studies and Fisheries Department, Dr. Alfred M. Muthee, Head Consortium, Nairobi, October 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. Report on Kenya National Water Quality Synthesis, J.O.Z Abuoda, and R.E. Hecky, November 2005
41. Report on Beneficiary Assessment of LVEMP Supported Micro-Projects in Lake Victoria Basin, Final Report, Julius Otieno Manyala, Consultant, February-April 2005
42. Community Participation Assessment, Final Report, Professor Joyce Olenja, Nairobi, Kenya, December, 2005
43. Review Report on Lessons Learnt, Water Hyacinth Control Component, Prof. Mwakio P. Tole, Nairobi, Kenya, December, 2005
44. Scientific Stocktaking Report, Progress During LVEMP1 and Challenges for the Future, Prepared by Robert Hecky, August 25, 2003
45. Third Overall Performance Study of the Global Environment Facility, ICF Consulting and partners, June 2005
46. 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. Once the deteriorating pollution problem and the related emergence of water hyacinth infestation in the lake, as well as the over-fishing became obvious and in the beginning the 1990s, the need for a regional program of actions was recognized. 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. There was a very low level of regional cooperation and no other regional activities succeeded in getting off the ground, other than the preparation and launch of LVEMP at that time. Furthermore, the relations between Kenya and the donor community was strained.

The impact of the degrading Lake environment 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 to around 30 million people, up from 25 million at the start of the project), increased pressure on the resource. 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 and it was a key co-financier of the project, with a grant of 35 million (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 still are) prevalent under the LVEMP, can be briefly listed as follows:

### ***a) Political regional cooperation:***

Until LVEMP was launched, the level of cooperation between the three countries 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 revitalized EAC was established, which currently is the leading institution for political and overall coordination of the regional efforts. Finally, 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. The regional dissemination of the scientific project papers and reports has not been satisfactory, due to limited capacity and apparent lack of confidence and trust among the parties. Dissemination and regional cooperation in the future 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 major achievement. 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, notably in Uganda where the driving force is the substantial over-capacity in the fish processing industry (capacity utilization is less than 50% at present). Notably, Uganda also disagrees to the level of sustainable fish harvest established by the two other countries. There remains a need for ongoing monitoring of fish extraction combined with additional awareness raising and enforcement of regulations among the fishing communities.

***d) Eutrophication of the Lake:***

The high level of nutrients entering the lake enhanced the environment for water hyacinth infestation. The infestation was significantly reduced (by around 85 percent) to non-nuisance levels and is the most tangible and visible change on the lake. However, the pollution that contributes to the nutrification remains a concern and is a priority for the next phase. Additionally 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. Research has not yet conclusively established changes in levels of pollutants in the lake, but the trend appears to be upward.

This is a function of increased economic activity and a higher population in the basin resulting in increased municipal and industrial wastewater, and run-off from non-point urban and semi-urban pollution sources, with few measures to treat the discharges. A few pilot measures have been undertaken in the catchment areas in the three countries to decrease the rural non-point pollution through erosion, but these do not yet exert a significant impact. 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 waters are largely entering through precipitation (atmospheric deposition) and are likely long-distance transported pollution from the land-based activities (dust from wind, bush fires, etc.). It is not known whether this pollution is coming from within or from outside of the Lake Victoria basin. A GEF supported program is seeking to develop a monitoring program 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 bush fires contributes directly and through increased erosion to atmospheric deposition (that accounts for around 84% N and 75% P) of nutrients into the Lake. Over-grazing and unsustainable agricultural practices lead to increasing erosion and contribute to the increased silt content in the rivers and subsequent sedimentation at the river mouths and a certain distance into the lake itself. 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 resource health. The use of fertilizers is presently limited in the area, but this is likely to change with the quest for improving 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 effects of decreased soil erosion, increased yield and income for several farmers. Afforestation activities are expected to have had a limited beneficial impact as well. Other add-on activities in the form of micro-projects (notably protection of water sources, etc.) are supporting the anti-erosion efforts by giving opportunities to harmful practices to the population.

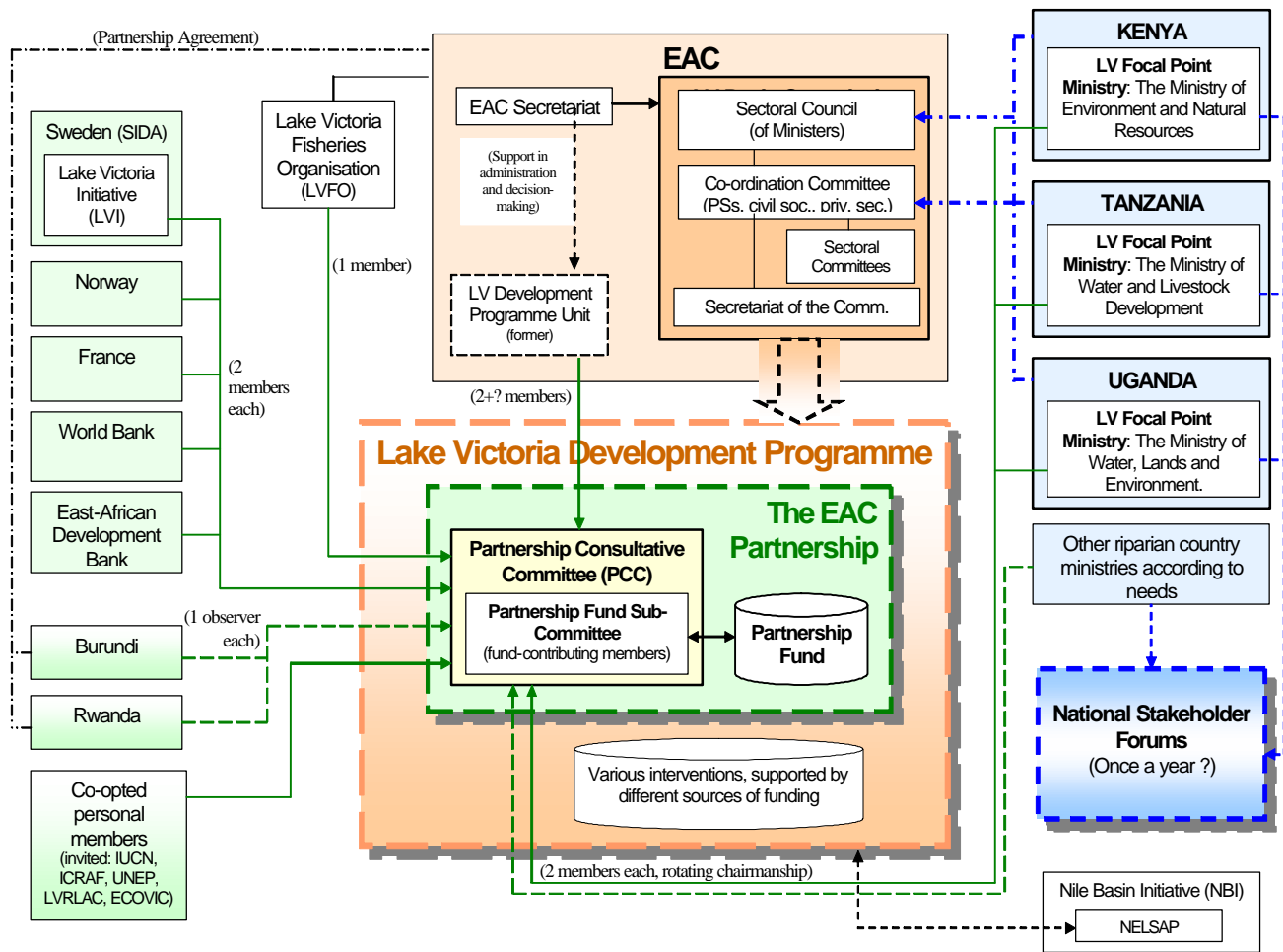
***f) The lake level and riparian communities:***

An issue which has clearly surfaced during the last two years, is the rapidly falling lake level, which cannot be attributed to activities of the LVEMP project, but which affects the outcomes of LVEMP activities. About half the reduction in lake levels can be attributed to the last three years' drought while the rest is a result of the over-abstraction of water for hydropower generation at Jinja, the main energy source of Uganda.

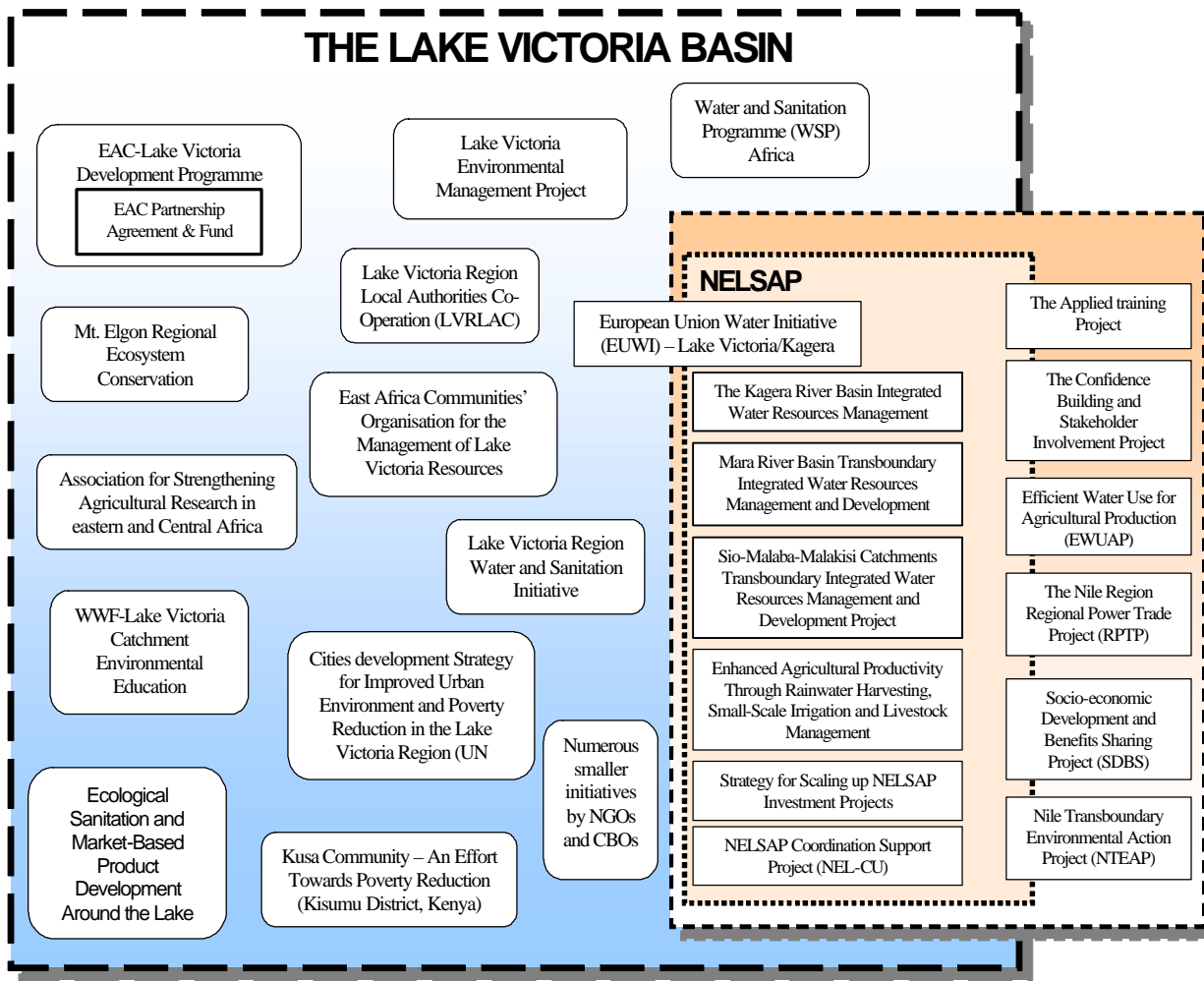
The reduced lake level has significantly and negatively affected the communities living on the lake shore. As the waters at the shore is shallow many places, the lake shore has moved several hundred meter at some locations, leaving the landing piers far up on dry land and making access to the lake difficult with boats and handling of fish more prone to pollution and reduced quality (see attached photo from Musoma). The low water level has also dried up some of the wetlands, resulting in people starting to cultivate in the wetlands (reference to photos from the Musoma and Mara Regions in Tanzania). The retracting lake shore has posed high economic costs on the use and maintenance of water supply infrastructures around the lake. The drying of wetlands also have impact on fish biodiversity, wetland fishing, production and utilization of wetland products for handicraft. In addition, the reduced level threatens the spawning grounds for fish, creating potentially significant risks to the fishing effort.

***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 topics of concern. There are numerous NGO-based activities, many having 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. Establishment of the LVBC in Kisumu with an explicit mandate to coordinate efforts should result in better synchrony 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)



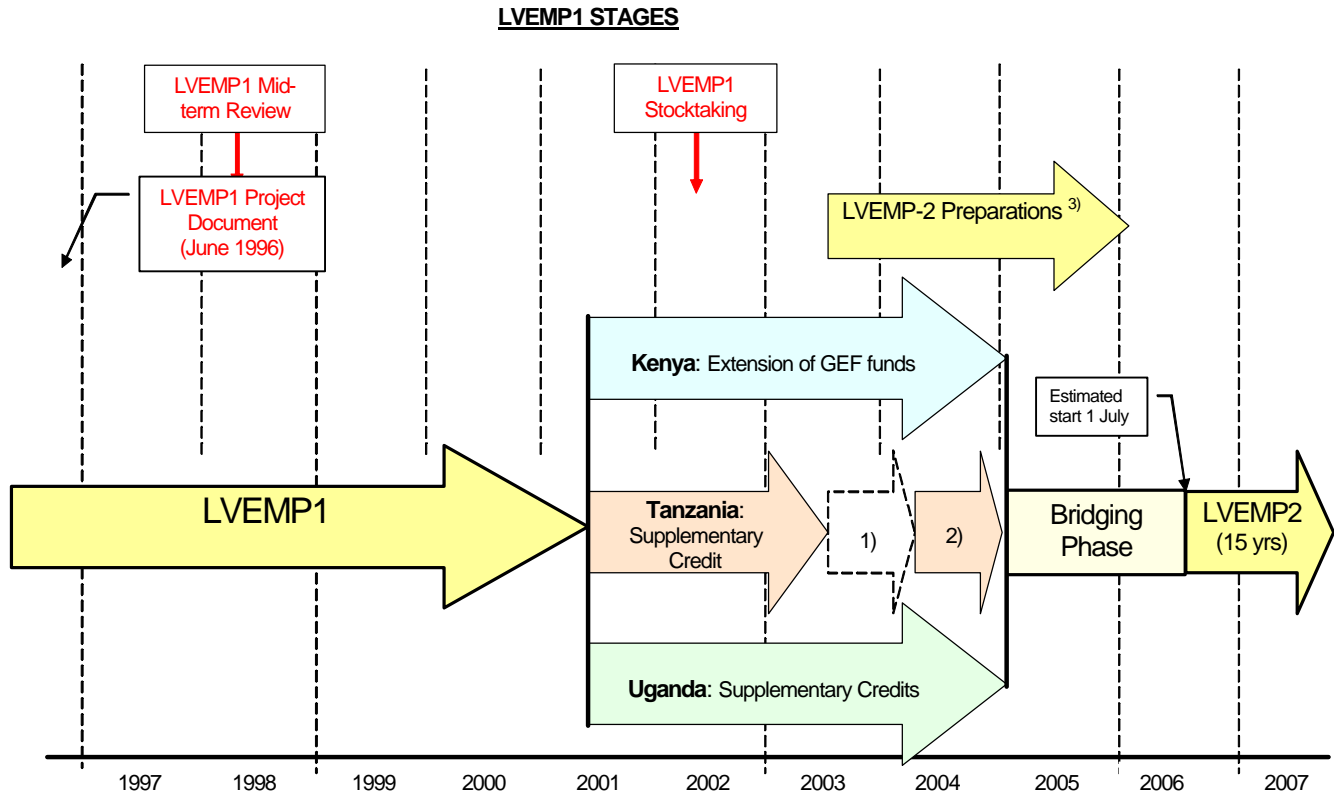
**Effects of reduction of Lake Victoria water level at Musoma, Tanzania** (© Tore laugerud, NCG March 2006)



**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:**

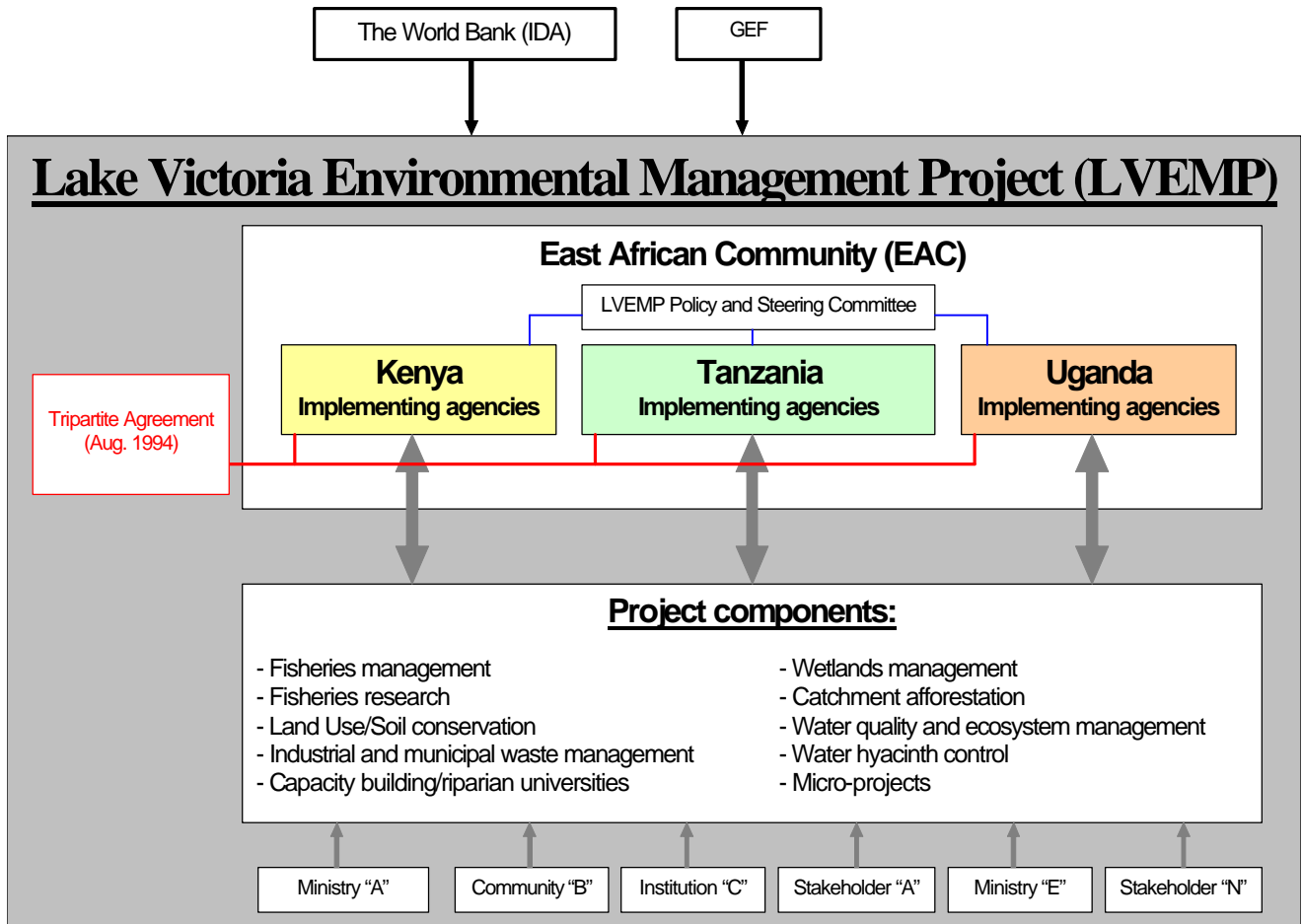
1): Activities continued for 8 months with counterpart funds only

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
<b><u>In KENYA</u></b>		
Dahir Warsame	Sen. Procurement Officer	World Bank Office, Nairobi
Hezron R. Mogaka	Project Coordinator LVEMP 2	Ministry of Environment and Natural Resources
Ephraim A. Mukusira	Deputy Director, Research & Technology	Kenya Agricultural Research Institute (KARI)
Jane W. Wamuongo	Assistant Director, Project Manager LVEMP 1	---“---, Land and Water Management
James M. Wandaba	Finance Officer	---“---
Stephen W. Njoka	Project Coordinator LVEMP 1	---“---, Project Office Kisumu
Agnes C. Yobterik	Community Participation Officer	---“---
Eddah Kaguthi	Management Information Officer	---“---
Samuel C. Ondieki	Deputy Director of Agriculture	Ministry of Agriculture (Desk Officer LVEMP)
David Kithale	Distr. Environment & Land Development Officer	Min. of Agriculture, Kericho District
Margaret Outa	District Environment and Land Use Officer	---“---
John Chirchir	Chairman	Ogirgir Focal Area, Kericho District
Alice K.	Officer in Charge	---“---
Various people	Members	---“---
Jonah Kebeney	District Land Use Planning Officer	Min. of Agriculture, Nandi South District
Josian Sang	Divisional Extension Officer	Nandi South District, Nandi Hills Division, Kibareng Community Group
Simon Lubira	Chief Technician	Capacity Building Component, Moi University, School of Environmental Studies
Gelas M. Sumiyu	Task Leader (??)	---“---, Environmental Health Division
Benard O. Orinda	Component Coordinator	Catchment Afforestation Component, Min. of Environment, Natural Resources and Wildlife, Kericho
Beatrice Mbula	Task Leader	---“---
Charity Munsyasya	Task Leader	---“---
George E. Karanu	Forester	---“---
Julius Sawe	Chairman	Kiplombe Chibarus CBO, Nandi North District
Justin Busienei	Secretary	Kamulati Tree Nursery, Chepngochoi Self Help Group, Uasin Gishu District
Susan W. Imende	Component Coordinator	Fisheries Management Comp., Fisheries

		Department, Min. of Livestock and Fisheries Development
Sonam Etyang	District fisheries Officer	---“---
Maurice Otieno	Senior Fisheries Officer	---“---
David o. Mbuya	Fisheries officer	---“---
Various people	Members	Kaloka Beach Management Unit
Various people	Members	Ogal Beach Management Unit
E. Wakwabi	Component Coordinator	Fisheries Research Component, KMFRI, Min. of Livestock and Fisheries Development
Job Mwanburi	Task Coordinator Fish Biology	---“---
Precilla Boera	Task Leader Aquaculture	---“---
Edna Wilhaka	Task Leader Information and Database	---“---
Ernest O. Tongo	Task Leader Socio-Economics	---“---
Mwende Kusewa	Component Coordinator	Kenya Agricultural Research Institute (KARI), Kisumu
John Okungu	Component Coordinator	Water Department, Ministry of Water Resources, Kisumu
Peter Muiruri	Biologist	---“---
Peterlis O. Opango	Scientist	---“---
Christabel Ogola	Procurement Officer	---“---
Felix Sangale	Scientist	---“---
Patrick Khisa	Scientist	---“---
Jenifer, John, Charles, Haidu, Kenipinus	Members	Bunyala handicraft & Produce Cooperative Society Ltd., Mubwayo Village, Yala Swamp
Stephen Katua	Component Coordinator	Wetland Management Component, National Environment Management Authority (NEMA), Min. of Environment, Natural Resources and Wildlife, Busia
Stanley Ambaza	Component Staff	---“---
Clement K. Wangai	Assistant Hydrologist	Wetland Management Component, Water Resources Management Authority (Lake Victoria North Catchment), Busia
<b><u>ELSEWHERE</u></b>		
Ladisy K. Chengula	Sen. Natural Resources Management Specialist. LVEMP Team Leader	The World Bank, Nairobi
Moses Wasike	Financial Manager	---“---
Ernst Lutz	Sr. Sector Economist, Former LVEMP Team Leader/Current Back-up Team Leader	The World Bank, Washington
William Lane	Former LVEMP Team Leader	---“---
Richard Kaguamba	Former LVEMP Team Leader	---“---
Graeme Donovan	Former LVEMP Team Leader	Retiree
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	---“---

