

**ENVIRONMENTAL MANAGEMENT
PROJECT**

OF

LAKE VICTORIA

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Acc. no. 4193.

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REGIONAL PROGRAM
FOR
ENVIRONMENTAL MANAGEMENT OF LAKE VICTORIA

Discussion Paper

Prepared by a World Bank/UNEP Reconnaissance Mission
November, 1992

1. A World Bank/UNEP mission visited Kenya, Tanzania and Uganda October 21 to November 7, 1992 to review the nature and extent of environmental degradation of the Lake Victoria Basin and to discuss with Government officials and scientists the prospects and modalities for regional cooperation in addressing such degradation.^{1/} This paper summarizes the mission's findings, conclusions and recommendations.^{2/} Part A outlines the problem. Objectives and trade-offs for a regional management program are discussed in Part B. Components and major activities under such a program are presented in Part C, followed by proposals for institutional arrangements in Part D, estimates of program cost and funding in Part E and, finally, recommendations for immediate action in Part F.

2. The paper is a discussion paper. It does not purport to have concrete and definite answers to pressing and complex questions. However, to move discussion towards action it puts forward for review and discussion a proposal for a four year "Regional Program for Environmental Management of Lake Victoria", comprising four program components covering twelve activities at a total cost of US\$ 20 million. Such a program addresses areas where regional action can proceed based on what are known facts regarding the state of the Lake Basin. It also addresses the need for more and better information to allow action in other areas to proceed. Above all, the proposal focuses on the need for establishing a process of regional cooperation, backed by national commitments and supported by the international community. The mission proposes therefore that the paper be given wide circulation among Government agencies as well as within the scientific, donor and NGO community.

A. Overview of the Problem

^{1/} A list of agencies visited and people met is enclosed in Attachment.

^{2/} The findings, conclusions and recommendations presented in this note are those of the World Bank/UNEP mission (Messrs. L. Vidaeus, World Bank, and G. Schneider, UNEP) which visited Uganda, Tanzania and Kenya and are subject to review by World Bank and UNEP management.

3. With a surface area of 68,800 km² and an adjoining catchment area of 184,000 km², Lake Victoria is a source of life for tens of millions of people. As the second largest freshwater body in the world (by surface), the lake and its ecosystem also harbor unique biological resources representing a global heritage.
4. The ecosystem of the lake has undergone significant and by some considered alarming changes over the last three decades. A prolific indigenous fish species diversity (300 species plus) is facing extinction. Phytoplankton productivity has increased two to three-fold, and the biomass of the lake has increased probably by a factor of ten. Simultaneously, water clarity, oxygen content and silica concentrations have been dramatically reduced. Scientist, still examining the causes of these extensive changes, focus on three contributing factors: (a) the introduction of Nile perch as an exotic species, heavily predated on the plankton- and detritus feeding haplochromine cichlids, thereby altering the food web and the trophic structure, (b) nutrient inputs from the adjoining catchment area causing eutrophication 3/, and (c) recent climate changes favoring the development of bluegreen algae and loss of oxygen in bottom waters.
5. The three riparian countries of Kenya, Tanzania and Uganda control 6%, 51% and 43% respectively of the area of the lake. Within each of these national sectors and their catchments, the natural resources are used to obtain food, shelter and energy, to secure residential and industrial water supply and transport needs, to irrigate land, and to dispose of human, agricultural and industrial waste. As the population around the lake increased and foreign organisms were directly or indirectly introduced into the lake ecosystem, the uses of the lake basin's resources have increasingly come into sharper conflict with each other. This has contributed to render the ecosystem unstable.
6. Each of the three riparian Governments has embarked on, or is committed to the preparation of a National Environmental Action Plan. Under each plan, Lake Victoria figures as an element demanding appropriate attention. There is an increasing realization that national action plans in respect to effective management of lake basin resources within national jurisdictions need to be coordinated at the regional level.
7. Despite extensive research and studies carried out on various aspects of the lake and its resources, the structure and functions of the ecosystem of the lake are yet to be fully understood 4/. Nevertheless, scientists and resource managers have raised concern

3/ The process whereby the water body is enriched by dissolved nutrients.

4/ Systematic biological survey and research work on Lake Victoria dates back to the British Colonial Service (1927-28). A Lake Victoria Fisheries Research Laboratory was established in Jinja, Uganda, in 1948. This facility subsequently evolved into the East African Freshwater Research Organization under the East African Community and, after independence, into the Uganda Freshwater Fisheries Research Organization (UFFRO). Simultaneously, Kenya and Tanzania established their own freshwater fisheries research organizations with centers at Kisumu (KFMRI) and Mwanza (TAFIRI). All organizations are dependent on donor funding. The EEC has supported the rehabilitation of research

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about the lack of a coordinated framework for management of the lake basin. In the continued absence of such a framework the viability of the lake basin may well be at stake.^{5/} Most recently a call for action was made by a gathering of regional and international scientists at the Jinja Workshop on People, Fisheries, Biodiversity and the Future of Lake Victoria in August 1992. Partly as a follow up to this call, representatives from the Governments of Kenya, Tanzania and Uganda agreed in principle at a meeting in Dar-Es-Salaam on October 22, 1992 to establish a Lake Victoria Fisheries Commission.

Summary of Major Issues

8. What are then some of the key questions and issues that a regional program for environmental management of Lake Victoria needs to address? Based on the available scientific information, the user conflicts and their underlying forces may be summarized as follows:

9. **Fishing Pressure and Sustainability of Fish Stocks.** Overall fishing pressure has reached levels which have prompted fishery scientists to predict reductions in fish stocks and total catches. The introduction of exotic species (notably the Nile perch and the Nile tilapia) into the lake some 30 years ago, led over time to an increase in the total fish biomass in the lake. Since the early 1970s, total catches have increased four to five fold. Indications are, however, that total catches have been levelling off in recent years without a commensurate drop in fishing effort. It is expected, therefore, that the maximum sustainable yield of the lake fishery is below the present level of exploitation.
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infrastructure in the three countries. The International Development Research Centre (Canada) has funded research at UFFRO and TAFIRI. The University of Leiden (Netherlands) has sponsored research on the Haplochromine species in Tanzania. USAID, NOAA, EPA and NSF have funded research in collaboration with KFMRI. These efforts supplemented by funding from the International Science Foundation (Sweden) have fostered the development of a network of international scientists cooperating in furthering the knowledge of the Lake Victoria ecosystem. Most recently, this alliance of researchers including their East African representatives met at a workshop in Jinja, Uganda, in August 1992.

^{5/} The FAO sponsored CIFA-Subcommittee for Lake Victoria has provided a regional forum for exchange of views on the management of the Lake's fisheries. However, recommendations of this Committees have not been politically binding.

^{6/} A recent review of the Lake Victoria fisheries is found in "The Fisheries of Lake Victoria: Review of Basic Data" (Draft), UNDP/FAO Regional Project for Inland Fisheries Planning Development and Management in Eastern/Central/Southern Africa (August 1992).

10. The present upward pressure on fishing effort is fueled not only by rising population and demand for animal protein among riparian communities. In recent years, however, expanded export market demand for the prime table fishes (Nile perch and tilapia) is believed to have been the main inducement for increased efforts. Investments in fish processing (filleting and freezing) plants are continuing unchecked and threaten to deplete stocks and or divert catches from being locally marketed by artisanal fishermen to meet local food demands.

11. **Biodiversity.** The introduction of the exotic species resulted in a substantial increase in the total availability of food from the lake. However, it also changed, or contributed to an already ongoing change in the food web structure of the lake.^{7/} This in turn led to a dramatic decline in the diversity of fish species in the lake. A large number of the 300 or so original species in the lake are now extinct or facing depletion.

12. Reduced biodiversity is of concern for several reasons. First, the reduction in the stocks of haplochromine species has contributed to an increased prevalence of algae and thereby to oxygen depletion at deeper levels of the lake.^{8/} Such oxygen deficiency threatens the survival of fish, in particular the Nile perch, thus reinforcing downward pressures on fish stocks. Second, a broader species fauna provides for greater variety in the diet of local people, and a greater variety in fishing effort, thereby spreading the economic benefits from the fishery. Finally, the conservation of indigenous species in Lake Victoria is of outstanding scientific importance to the international community. The adaptation of such species to ecological niches provides for rare opportunities in the study of evolutionary processes.

13. **Pollution and the Lake Basin Environment.** The use of Lake Victoria as a depository for waste is expanding with rapid population growth in the lake basin. Deteriorating water quality reduces benefits to riparian communities from using the lake, streams and rivers as sources of drinking water or for fishing. Polluted waters mean worsened sanitary conditions and spreading of water borne diseases, including cholera and typhoid fever. Finally, pollution of the lake and its tributaries changes the environment for living resources and threatens the biodiversity of the lake basin.

14. Lake pollution comes from many and dispersed sources. Eutrophication, caused by nitrate and phosphate inputs, is considered the greatest threat to the lake's water

^{7/} Scientists have also pointed to overfishing as a possible cause of the decline in the haplochromine species.

^{8/} An alternative hypothesis explaining the increase in phytoplankton is that algae productivity and biomass were stimulated by nutrient inputs from the catchment or from the atmosphere. A third hypothesis is that climatic changes in combination with increased atmospheric loading of nutrients are responsible for the biological and chemical changes in the lake.

quality. It adversely affects fisheries through induced algae blooms, oxygen deficiency at lower depths of the lake, and subsequent upwelling and mixing of waters resulting in fish kills. Much of the pollution originates with economic activities undertaken far from the lake shore in the upper parts of the basin (this is most significant on the Kenyan side of the lake). Agricultural run-offs, aggravated through deforestation, and associated land erosion play a major role in the pollution process. Thus, land use in the catchment is a major issue in lake management.

15. **Land Use in the Riparian Zone and Catchment.** Wetlands act as natural filters for nutrients and silt from agricultural lands and rivers. The wetlands around Lake Victoria are increasingly unable to perform such functions as they become converted to agricultural or industrial use. Also, extensive deforestation of the riparian zone has been caused by the woodfuel needs of an expanding lakeshore population. All of this directly contributes to the eutrophication of the lake and associated problems. Since wetlands also provide breeding and nursery grounds for many species, their conversion to agricultural or other uses adversely affects the diversity of fish species and recruitment of young fish to the commercial fishery. Also, the role of wetlands for bird life should not be overlooked.

16. Increased pressures on land in all three riparian countries has led to high rates of deforestation, increased soil erosion, and high loads of silt and fertilizers being transported through tributaries into the lake thereby contributing to eutrophication problems. Most of the rivers draining into Lake Victoria are found on the Kenyan side. The catchment of these rivers covers an area (seven administrative districts) of close to 50,000 km², accounting for 8 percent of the total land area of Kenya, and with a population equivalent to about 40 percent of Kenya's population. Thus, land use in this predominant catchment area of the lake basin is directly impacting on the environmental state of Lake Victoria.

17. **Threat of the Water Hyacinth.**^{9/} The infestation of the water hyacinth (*Eichhornia crassipes*) which has occurred in recent years in Lake Victoria poses an

^{9/} The water hyacinth occurs naturally in floodplain of South America, where its growth and spread is contained by periodical changes in water levels (and availability) and also by insects, fungi and diseases. At the turn of the century the plant was introduced on the African continent, first in Egypt followed by South Africa, and spread to Zimbabwe in 1937 and to Mozambique in 1942. It appeared in the Zaire River basin and in the Upper Nile swamps of central Sudan in the 1950s. Unrestricted by space, nutrients and natural enemies, a single plant can produce 140 million daughter plants every year, enough to cover 140 hectares with a fresh weight of 28,000 tons. The plant also produces seeds which can survive in mud for 30 years, posing severe reinfestation problems in cleared areas. Water hyacinth was reported on Lake Victoria in 1990, when it was officially spotted in the Ugandan sector. The plant is believed to have entered the lake, possibly even earlier than 1990, from the Kagera River flowing into the lake from Rwanda.

urgent management problem. The prolific spreading of this exotic weed is adversely impacting the biological productivity of the lake (reduced levels of dissolved oxygen and penetration of sunlight), restricts fish breeding and nursing areas, limits access by fishermen to landing areas, impairs water supply, provides suitable habitats for vectors of various human diseases, e.g. schistosomiasis and malaria, and encumbers lake transport and hydro-power generation. Due to its high rate of evapotranspiration (about four times that of an open water body), the water hyacinth fosters the drying up of the riparian/wetland zone, thus enabling non-wetland species to invade this zone. These problems are most acute along Ugandan shores of the lake. However, they are now rapidly spreading in Tanzania (mainly along the western lake shore) and in Kenyan waters (north and south of the entrance to the Nyanza Gulf). Regional cooperation in the control of the water hyacinth would involve visible activities that generate tangible results. As such they may prove valuable in spurring the development of a broader regional management program for the lake.

Rationale for a Regional Management Framework

18. Lake Victoria is a shared water body. Resource use by one riparian state impacts the activities of the riparian partners, a classic illustration of externalities both from the point of view of a common pool situation and interdependent production functions (para. 20-21). Hence, resource development and management by riparian Governments within national jurisdictions has to proceed and be coordinated within a regional cooperative framework backed by a strong political commitment from the partner countries. Strategies, policies and action plans need to be coordinated with reference to broad regional objectives and guidelines. Cooperation in research and monitoring will assist in joint strategy formulation and implementation.

B. Management Objectives and Trade-Offs

19. The overall objective for environmental management of the lake basin should be to maximize the benefits to the riparian countries from using resources within the basin to

- (a) generate food, employment and income to the people around the lake;
- (b) increase value added to the riparian countries from the development of industrial export oriented fish processing;
- (c) supply safe water supplies and a disease free environment for riparian communities; and
- (d) conserve biodiversity and genetic resources, contributing *inter alia* to regional benefits from tourism and to the preservation of a global natural heritage.

20. The development and management of the uses of the basin's resources (fishing, waste disposal, land use practices, residential and industrial location etc) has to consider trade-offs between the above objectives. For example:

- (a) Maximizing sustainable yield for the lake fishery in the longer run may require reduction in fishing effort from current levels with consequent sacrifice of income to the present generation of fishermen.
- (b) Development of an export-oriented industrial fishery will increase export earnings and value added but may, unless properly managed, reduce long term sustainable yield from the fishery and/or availability of food for the people around the lake.
- (c) Human settlement and associated food production systems in the riparian zone (especially wetlands) may adversely affect the biological environment supporting fish production.
- (d) Fish production from the lake is significantly impacted by land use in wetlands and catchment areas.
- (e) Industrial enterprises dumping untreated waste into the lake pass on costs to lake fishermen in the form of reduced fish catches.
- (f) Preservation of biodiversity may require giving up short term gains for future production related benefits.

21. The management problem is further complicated by the fact that these user conflicts or trade-offs have transboundary implications to varying and at this stage not fully known degrees. Some illustrative examples:

- (a) The level of discharge of pollutants by shore based industries or municipalities in one part of the lake will, dependent on the nature of the circulation system in the water body, raise costs to resource users (fishermen and/or urban drinking water pumping stations) in other parts of the lake.
- (b) Farmers and agricultural estates in western Kenya, for example, through their agricultural and land use practices, related to sugar, tea, coffee and small holder food crop production, are impacting fish production in the Winam Gulf (the Kenyan sector of the lake) via agricultural run offs. Again, dependent on the lake's circulatory system and the biodegradation of wastes, transport of pollution to other sectors of the lake will link production functions for agriculture on one side of the lake to fish or drinking water supply in other parts of the lake.

- (c) Artisanal fishermen in any one of the three countries who fish for species that migrate across national sectors of the lake (such as the Nile perch) will be adversely affected by an expanding artisanal or industrial fisheries in waters controlled by other countries.

22. The following may therefore be concluded: To be effective, the management of lake basin resources needs to be integrated across resources uses. That is, management decisions regarding land use and agricultural development in the riparian zone and the wider catchment and regulation of pollution into the lake have to consider the implications on the lake's fish and water resources and be coordinated with management decisions regarding the use of such resources. Such integration, however, is a necessary but not sufficient condition for successful lake basin management. There will be little incentive or feasibility for riparian countries to implement integrated management programs covering the portion of the basin under their respective control. A regional cooperative approach to management is required to harmonize management objectives and to provide a framework within which to resolve transboundary issues.

23. It is proposed that such cooperation should (initially) focus on four main program areas or components. Each such component impacts one or more of the management objectives defined above. The four components are:

- (a) **fisheries management** to benefit food production, income and employment, value added and preservation of biodiversity; *and genetic resources.*
- (b) **management of lake pollution and water quality** to ensure safe drinking water, reduce water born diseases and conserve the lake ecosystem and its biodiversity, and to help sustain food production, employment and value added from fisheries;
- (c) **management of wetlands** and other habitats of the riparian zone as a strategy to control lake pollution (indirectly impacting fish production and water supply objectives), but also to provide food, income and employment to local communities, with the **control of the water hyacinth** being a pressing priority; and
- (d) **management of land use in the catchment** to minimize adverse impact on the lake ecosystem as well as production and conservation objectives related to its use.

C. Program Components

24. It may be useful to think of these four components as making up the thrust of what could be referred to as a "Regional Program for Environmental Management of Lake

Victoria". Each of the components would comprise a set of individual activities. Some 11 such activities are proposed below.

A - Fisheries Management

Background

25. Over 100,000 artisanal fishermen using more than 20,000 small craft caught an estimated 550,000 tons of fish in 1990, which represents a sixfold increase from 1975 catches.^{10/} The landed value of the catch equaled an estimated US\$90 million and about US\$280 million at the market level. The accomplishment of these levels of employment, food availability and incomes was made possible by the introduction of the Nile perch in the 1960s. Recent analysis of the available information of effort and production indicate that the impressive yield and benefits are starting to level off. Nile perch catches are at a peak and believed to be decreasing in Kenya and Uganda. These trends, coupled with decreases in catches per unit effort and mesh sizes used by fishermen, may signal a rapid decline in the Nile perch fishery. The Nile perch has been observed to change its feeding behavior, including reverting to cannibalism (feeding on its young). Such changes could be interpreted as the Nile perch adapting to a narrower Nile perch's food base.

26. Given the unstable ecosystem, it is difficult to predict at what level the fishery will stabilize. However, it is clear that a regional management regime urgently needs to be instituted for the lake fisheries to minimize future declines in fish stocks and the adverse socio-economic impact that would be expected to follow. The three main strategies would include management of fishing effort, control of expansion of the fish processing industry, and protection of endangered species.

- (a) **Management of Fishing Effort.**^{11/} Direct regulation of fishing effort, through controlling the number of boats fishing in an artisanal fishery is likely to meet with limited success. Therefore, primary consideration needs to be given to management measures that prevent use of small mesh fishing nets and indiscriminate beach seining, and promotion of more selective fishing gear, all serving to protect premature catches of young fish and

^{10/} Fisherfolks and dependents around the lake number an estimated 1.3 million.

^{11/} Management of the fishing effort in the Nile perch fishery is of immediate importance. However, management of the lake fisheries need also to examine fundamental and complex issues related to options of nursing the present fishery based on primarily three species (a result of the earlier introduction of the exotic species) or promoting through management and possibly restocking (involving aquaculture) a revival of a more diversified multi-species fishery.

- (c) Artisanal fishermen in any one of the three countries who fish for species that migrate across national sectors of the lake (such as the Nile perch) will be adversely affected by an expanding artisanal or industrial fisheries in waters controlled by other countries.

22. The following may therefore be concluded: To be effective, the management of lake basin resources needs to be integrated across resources uses. That is, management decisions regarding land use and agricultural development in the riparian zone and the wider catchment and regulation of pollution into the lake have to consider the implications on the lake's fish and water resources and be coordinated with management decisions regarding the use of such resources. Such integration, however, is a necessary but not sufficient condition for successful lake basin management. There will be little incentive or feasibility for riparian countries to implement integrated management programs covering the portion of the basin under their respective control. A regional cooperative approach to management is required to harmonize management objectives and to provide a framework within which to resolve transboundary issues.

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increase the recruitment to the fishery. To be effective, such measures need to be coordinated and harmonized across the fishing zones controlled by the three riparian countries.

- (b) **Control of Expansion of Industrial Processing.** Industrial processing of fish and export licensing are related priority issues. The rapid and virtually unchecked (even officially sanctioned) build up of fish processing capacity along lake shores of all three countries supports large scale trawling and threatens to divert supplies of food for the region for export. Limitations or outright bans on further investments in processing capacity need to be imposed, while impacts of industrial processing on local communities (food supplies, prices, incomes, employment etc) is thoroughly examined. Again any such measures need to be planned and implemented jointly by fisheries administrations in the three riparian countries.
- (c) **Protection of Endangered Fish Species.** An indiscriminate use of small meshed fishing nets continues to threaten the survival of small endemic fish species. Management of lake-wide artisanal fisheries must contribute to reducing this threat. This may involve excluding fishing effort from some areas (protected areas or fish parks) and prohibit fishing during certain seasons. Prudent management of wetlands, controlling the water hyacinth, reducing lake pollution and conservation through captive breeding programs are other means by which the objective of species diversity will need to be addressed.

Component Activities

27. Strategies to address the above management priorities need to be formulated and implemented through appropriate institutional arrangements for regional cooperation in fisheries management. A proposal for a Lake Victoria Fisheries Commission is under active consideration. Management strategies also need to be supported by improved scientific knowledge and a better fisheries performance data base.^{12/} Successful execution of regional management strategies further depends on the implementation capacities of national fisheries administrations. Hence, the establishment of a regional

^{12/} The only comprehensive assessment of the fish stocks dates back to 1969/71 when the lake was a multi-species fishery area based on indigenous species. Since the transformation of the fishery, which followed the proliferation of the Nile perch, no scientific information has been provided on the status of fish stocks in offshore waters of the lake, and no systematic stock assessment has been made at the regional level. Furthermore, historical and recent fisheries statistics are unreliable as a result of weak national systems for collection of data on catches and effort. This state of affairs introduces considerable uncertainty for analysis of the performance of the fisheries and the planning of fisheries management and development generally.

fisheries management program involves three interrelated activities: (1) the establishment of an appropriate regional agency for fisheries management to set a common policy, adopt regulations, and coordinate implementation of management measures (2) the improvement of the management information base, including a fisheries research program, and (3) the strengthening of the fisheries administrations of the riparian Governments.

28. **Establishment of a Lake Victoria Fisheries Commission.**^{13/} The declared intent of the three riparian Governments to establish a Lake Victoria Fisheries Commission is a significant first step. The draft convention adopted by senior national fisheries administrators officials in October 1992 in Dar-Es-Salaam provides for the following organizational structure: (i) establishment of a three member Commission, consisting of the "chief executive officers" of the Ministries responsible for fisheries management, to be assisted by senior executive officers responsible for fisheries administration, and senior scientists responsible for fisheries research, (ii) a permanent Secretariat headed by an Executive Secretary, and (iii) a Fisheries Management Committee and a Scientific Committee. The mandate of the Commission would be to promote cooperation in resource management, adopt regulatory measures to be enforced by the parties to the Convention, provide for research and dissemination of research results, and to seek and allocate funds in support of the activities of the Commission or its contracting parties.^{14/}

29. The next steps would be as follows:

- (a) The three Governments would review the draft convention and ratify the commission agreement (process underway, completion expected by mid 1993).

^{13/} The mission reserves judgement on the appropriateness of the provisions contained in the draft convention document.

^{14/} "Draft Convention on the Establishment of the Lake Victoria Fisheries Commission" (revision 2. 22.10.92 PM). This document specifies the functions of the Commission to be the following: (a) foster cooperation and harmonization of national measures among the three countries in connection with the management, development, exploitation and conservation of the living resources of Lake Victoria; (b) develop and adopt conservation and management measures for any fishery on the basis of best available information, with parties to the Convention being obligated to implement and enforce the Commission's decisions; (c) provide for conduct of research related to living resources of Lake Victoria, water quality, and pollution, and the dissemination of research results; and (d) seek and allocate funds to the activities of the Commission or the contracting parties.

- (b) A meeting would be convened to formally establish the Commission (this could possibly be done by FAO as part of its mandate under the CIFA Subcommittee).
- (c) Preparation of operating guidelines (protocols), appoint key officers and recruit staff of the Commission's Secretariat and Committees.
- (d) Securing the necessary initial resource support for the Commission, its Secretariat, and committees (Fisheries Management Committee and Scientific Committee).

30. **Improvement of the Information Base for Fisheries Management.** A regional fisheries management program for Lake Victoria needs to be supported by fish stock assessments, surveys and research in fish biology and limnology, better and standardized information on fish landings. It also depends on an improved understanding of the socio-economic environment in which artisanal fishermen operate. Such an understanding is critical to determine mobility of capital and labor in and out of artisanal lake fisheries. Relevant research areas are already fairly well identified. 15/

31. The next steps would be to prepare, adopt, secure funding, and implement a master plan for fishery research and resource assessment work required to support regulatory decision making by the proposed Commission. In the preparation of such a plan, consideration should be given to the need for

- (a) establishing an effective regional mechanism (the Commission's Scientific Committee) to plan, coordinate resource support, and monitor implementation of a regional fisheries research plan; and
- (b) strengthening of the capability of national fishery research institutes and organizations in the three countries to implement individual components of a regional fisheries research program, including support for the necessary collaborative agreements with international research organizations.

32. **Strengthening Extension, Monitoring and Enforcement Capabilities of National Fisheries Administrations.** Effective enforcement of the Commission's

15/ The recent international workshop in Jinja, Uganda, concluded that effective management of the lake fisheries depends on a coordinated regional research program covering limnology, fish biology and socio-economics. Research priorities have also been identified through the preparation of a Lake Victoria Aquatic Resources Research Project which has been submitted to the EEC for funding (as Phase 2 of a Regional Fisheries Research Project). The meeting of Governments in Dar-es-Salaam in late October, 1992 also considered a set of proposals for urgently required research projects.

regulatory decisions depends on substantial strengthening of the capabilities of national fisheries administrations to

- (a) establish and maintain a fisheries statistics and performance data base that allows for the monitoring and evaluation of the fishery and the impact of regulatory measures; ^{16/}
- (b) maintain a fisheries extension service to work with fishing communities in adopting schemes to facilitate compatibility with regionally established fishery regulations, and a field enforcement capability involving trained staff and required vehicles (speed boats, vehicles); and to
- (c) have such a field capability backed by regulations with appropriate penalties and fines governing the violations of fishery regulations.

33. The next steps would be to prepare and adopt programs and secure funding for strengthening the capability of national fisheries administrations to monitor the performance of lake fisheries, carry out effective fisheries extension work and enforce fisheries management regulations.

- (a) Recognizing that government budgetary resources for administering fisheries management and development will continue to be restricted, realistic criteria must be adopted for the design of systems and structures for monitoring and evaluation of the performance of fisheries and for fisheries extension and enforcement of fisheries regulations.
- (b) Based on such criteria design, a monitoring and evaluation system and a fisheries enforcement organization should be designed, the present capabilities in these areas evaluated, and a time bound program with resource requirements prepared for implementing improved systems.
- (c) It is expected that external financial assistance will initially be required to finance the implementation of upgraded national systems. However, national funds will be required to sustain the systems over time, and cost recovery through taxing fish exports needs to be considered early on.

B - Management of Lake Pollution and Water Quality

Background

^{16/} In Uganda (possibly also in Kenya and Tanzania) efforts have been made in recent years under an FAO project to upgrade the fisheries statistics collection system.

34. The main contributors to the pollution of the waters of Lake Victoria and its tributaries are municipalities, agro-industries and other industries, as well as farmers and agricultural estates.

- (a) Sewerage is discharged by municipalities into the lake, rivers or streams with little or no treatment. Wherever treatment facilities have been installed, they tend to be inadequate, ill-maintained, or broken down. (Some municipalities treat their sewage mechanically. In Kampala, such mechanically treated sewage is released into a wetland area, where further biological treatment is expected to occur).
- (b) Pesticides and other agro-chemicals from farm land or agro-processing in the catchment find their way to the lake via agricultural run-offs into streams and rivers. This process is accelerated by extensive loss of vegetative cover in large portions of the catchment. Such loss in turn results from clearing forest for agriculture or bush or woodlands for fuelwood. Soil erosion associated with deforestation also results in siltation of rivers and sedimentation of the lake.
- (c) Industrial discharges go essentially untreated into rivers, streams or the lake. In all three countries the lake shore and the riparian zone are the sites of food processing plants such as sugar factories, coffee processing (hulling/washing) plants, dairy-plants, fish processing plants, breweries), other agro-industrial enterprises such as textile mills, tanneries, and oil seed mills, or other industries such as soap and cosmetics factories, agro-chemical and bottling plants. These plants discharge biodegradable and nutrient-rich effluent, as well as smaller quantities of industrial chemicals such as heavy metal compounds, organochlorines, PCBs, and petroleum products.^{17/}

35. The causes for this state of affairs are many and complex. The lack of municipal treatment of sewage results from lack of funds and equipment on part of local authorities. This in turn stems from their inability to collect revenues. While there exist regulatory frameworks for controlling pollution of water bodies in all three countries, Government agencies are unable to effectively enforce them. The ability of such agencies to provide proof of violation or evidence of adverse impact is severely restricted given a limited

^{17/} The Ugandan Factory Inspectorate has an inventory of the about 5000 "factories", including small workshops, in the Ugandan part of the catchment, the processes they use, and approximate estimates of the quantities and quality of sewage they discharge into the lake. Also, Kenyan and Tanzanian authorities have information on quantities and quality of industrial pollutants. However, all riparian countries heavily rely on data provided by the industries themselves, and do not have any independent effluent monitoring system in place.

capacity for monitoring of water quality, sampling of effluent and laboratory analysis.^{18/} Moreover, penalties for violation of existing regulations are too low to deter polluters from continuing with their practices or installing control measures.

36. Pollution and its impact on the lake environment is of particular concern in the Kenyan sector of the lake, due to the number and concentration of sources of pollution discharging into the Winam Gulf.^{19/} A recent study carried out by the Kenyan Lake Basin Authority (LBDA) and FAO attempted to quantify urban, industrial and agricultural loads in this part of the lake.^{20/} It identified eutrophication due to high phosphate loads as the major water quality problem, and recommended that control and reduction of the phosphate inputs into the lake should become a top management priority. Other priorities involved reduction of high urban and industrial organic BOD loads and pesticide management.

37. While equivalent pollution studies are yet to be undertaken in other parts of the lake, one may assume that the identification of management priorities done under the Winam Gulf Study are reasonably representative for Lake Victoria as a whole. If, as suggested by the Winam Gulf Study, phosphate feeding by agricultural run-offs is a major issue, the implication is that management of land use in the catchment areas holds one of the keys to arresting the environmental degradation of the lake. To reduce agricultural pollution appears to be a difficult task. As a non-point pollution, numerous very small sources account for the various nutrients/pesticides ending up in the lake and its tributaries. To do something in this field means directly affecting the land-use pattern in the whole catchment. Nevertheless, this is an important issue to be tackled.

^{18/} Across the region fisheries research organizations, water development and supply departments, universities, parastatals, and municipalities are to varying degrees involved with collecting and evaluating water quality data, focusing on parameters of main interest to the respective organizations. Systematic and continuous gathering, interpretation and exchange of water quality data for management purposes, however, is lacking at the national as well as the regional level.

^{19/} On the Ugandan side, the NEAP Issues Paper addressing water resources notes that "throughout Uganda water quality is impaired, often severely, by pollution from industrial wastes, poor land management, agro-chemical applications and improper sanitation." In the context of assessing water quality management priorities for Tanzania, a recent World Bank environmental mission pointed out that Lake Victoria would appear to be particularly affected by poor water quality, as a result of discharges from point sources in the Mwanza area and agricultural run off from the hinterland.

^{20/} See Aketch (LBDA), Calamari (FAO) and Ochumba (KFMRI): Preliminary Report on the Conservation of Aquatic Environment in the Winam Gulf Basin Area, April 1992.

38. The challenge of controlling industrial pollution calls for a combination of incentives to industry to reduce pollution and better enforcement of stricter regulations. The latter needs to be harmonized throughout the lake area.

Component Activities

39. The program component would involve five interrelated activities: (1) strengthening and harmonization of national regulatory and incentive frameworks, (2) strengthening national enforcement capabilities, (3) improvement of the management information base, (4) programming of investment requirements, and (5) institutional support for regional coordination.

40. **Strengthening and Harmonization of National Regulatory and Incentive Frameworks.** This will initially require a review of national regulations governing pollution standards (effluent standards, daily maximum loads, reporting requirements) and penalties for discharges of key pollutants into water bodies with the view to deterring industrial and municipal pollution. Simultaneously, consideration should be given to the strengthening of incentives, for example through investment tax credits, to induce industries to implement pollution control measures or to switch to new and less polluting manufacturing/processing technologies.

41. National proposals to revise current regulations should be harmonized with respect to regional objectives to control water quality to prevent industries moving to countries with the "softest" standards.

42. The next steps would be as follows:

(a) The three Governments should as part of the preparation of their individual National Environmental Action Plans (NEAPs) review and propose revisions to their regulatory frameworks for discharges of pollutants into water bodies. Work on this is scheduled under the Uganda NEAP, needs to be planned in the case of the Tanzania NEAP (which is scheduled to follow its National Conservation Strategy), and has to be worked into the NEAP process expected to get underway in Kenya shortly.

(b) Once such national proposals have been prepared they should be reviewed and harmonized with respect to regional objectives for water quality in Lake Victoria. This work would have to be done through a suitable regional mechanism for coordinating lake pollution and water quality control. Such a regional coordination unit would have to develop regional water quality control objectives and guidelines for pollution control applicable to Lake Victoria.

43. **Strengthening National Enforcement Capabilities.** The capability of Government agencies to enforce regulations pertaining to pollution and water quality

control needs to be enhanced by (a) strengthening the operations of relevant departments (such as the Water Law Office in Tanzania); (b) upgrading the capabilities (skills, procedures and equipment) of Government laboratories to collect and analyze water samples; and (c) streamlining responsibilities of Government agencies.

44. The next steps would be for relevant Government agencies to prepare programs aimed at putting such measures in place in a cost effective manner. While it can be expected that donor funding of such programs will be required, their design and scope must consider the paramount objective of sustainability.

45. **Improvement of the Information Base for Controlling Lake Pollution and Water Quality.** Effective control of lake pollution and water quality depends on

- (a) the establishment and operation of a regional water quality monitoring program for the whole lake and its major tributaries, to be built from national program components; and
- (b) improved scientific understanding of the effect of pollution activities on the lake environment and resource uses through regional collaboration and coordination of research related *inter alia* to the lake's capacity to absorb and biodegrade waste (including the lake's internal phosphorus cycle), the lake's circulatory system and how it impacts transport of pollutants from one part of the lake to others, and sources of pollution.

46. The next steps would involve the following:

- (a) National institutions involved in water quality measurements need to clearly define their monitoring objectives and interests, such as parameters, frequency of measurements, and location of sampling stations. Given such objectives, national programs for collection, analysis and exchange of water quality data should be designed based on a cost-effective assignment of tasks and responsibilities between involved institutes and laboratories.^{21/}
- (b) In a subsequent step, and within the framework of a suitable regional coordinating body, a regional program for monitoring water quality could be developed. This monitoring program would build on the national systems and, wherever feasible, on ongoing regional initiatives such as the HYDROMET project or the Global Environmental Monitoring System supported by UNEP. The

^{21/} In all three countries the fragmentation among agencies of the responsibility for water quality monitoring is considerable. The situation calls for consolidation based on blue prints for national water quality monitoring.

program could also involve the establishment of a regional data base, a regional reference laboratory, and regional training programs.

47. **Programming of Investment Requirements.** Municipalities need to improve their sewage collection system and treatment plants, increasing the efficiency of mechanical treatment and introducing biological treatment. While such measures could be addressed with the help of external financial and technical assistance, the limiting factor will ultimately be the ability of municipalities to raise the necessary funds to sustain maintenance and operations of such facilities.

48. The next steps would involve the following:

- (a) National agencies should review the needs and priorities for investments by municipalities and other local authorities around Lake Victoria for rehabilitation of existing or installation of improved sewage collection or treatment facilities.
- (b) On the basis of this work, a regional coordinating committee on lake pollution and water quality control (see para. 50), with an appropriate representation including senior from Government water, industry, local Government and environment agencies, would provide technical guidance on evaluation of project proposals and coordinate preparation of detailed investment projects.

49. **Institutional Support for Regional Coordination.** Actions proposed under B.1 - B.4 above need to be coordinated by a regional task force or committee on lake pollution and water quality control. Such a task force could evolve into a permanent committee for regional coordination. Further action needs to be taken to ensure integration at the regional level of objectives, policies and programs for lake pollution and water quality control with those related to the management of other resource uses.

50. The next step would therefore be the establishment of a Regional Coordination Committee on Lake Pollution and Water Control, consisting of senior officials from national water resource management agencies. This Committee would have the responsibility to serve as a technical forum for harmonizing national regulatory and incentive frameworks, prepare a regional water quality monitoring program, and coordinate the preparation of an investment program for municipal sewage collection and treatment facilities.

C - Management of Wetlands 22/

22/ Including adjacent habitats of the riparian zone.

Background

51. Kenya, Uganda and Tanzania have substantial inland water bodies in the form of lakes and associated river systems. Management of wetlands is therefore a key subject matter to be addressed under each country's National Environmental Action Plan.^{23/} However, development and management of wetlands are also of regional concern. Not only do wetlands extend across national boundaries, but the use of wetlands in one part of a shared water body affects water quality and biological life in other parts. For example, extensive loss of wetlands has occurred along the Ugandan shores of Lake Victoria through draining of swamps for agriculture and settlement and destruction of swamp forests for harvesting of fuelwood. As a consequence, the deposition of nutrients and silt in the lake increases through reduced wetland filtration of nutrients and trapping of silt. This in turn impacts lake wide artisanal fisheries or preservation of biodiversity. Hence, there is a need for harmonization of national wetlands policies and coordination of their implementation.

52. As indicated in para. 17, the proliferation of the water hyacinth on Lake Victoria poses an urgent management problem. The area covered by the water hyacinth in the Uganda sector has expanded rapidly, as reported by surveys carried out by Ugandan scientists.^{24/} If unchecked, the prediction is that the weed will spread to cover four out of five fish landing areas on the Ugandan shore line. ^{25/} The weed has already spread to the Tanzanian and Kenyan sectors of the lake. It is feared that if the weed is allowed to establish itself in this relatively shallow part of the lake, the potential disruptive impact on local fisheries, biodiversity and the lake environment would be far reaching. Hence, the control of its further spreading and the recovery of areas already infested constitute an extension of the management of wetlands component.

53. There is broad agreement among resource managers, whether concerned with fisheries or water supply, as well as fishery scientists that arresting the spread of the weed is of highest priority. The control of the water hyacinth needs to be an integrated and

^{23/} In Uganda wetlands cover one-tenth of the total land area. A National Wetlands Conservation and Management Program was launched by the Ministry of Environmental Protection in 1989 with assistance from NORAD and IUCN. A national policy for sustainable use and rational management of wetlands is expected to be adopted as part of the NEAP process.

^{24/} See "The Potential for Further Proliferation of Water Hyacinth in Lakes Victoria and Kyoga and Some Urgent Aspects of Research", by T. Twongo, F.W. B. Bugenyi and F. Wanda of Uganda Freshwater Fisheries Research Organization (paper presented at the CIFA Sub-Committee for Management and Development of the Fisheries of Lake Victoria, Sixth Session, 10-13 February, 1992, Jinja, Uganda).

^{25/} Personal communication Mr. T. Twongo, UFFRO.

urgent part of the management of the resources of the lake basin. 26/ Studies of the problem have been made and seminars and workshops have been held in recent years. Most of these activities have focused on the Ugandan situation, where Lake Kyoga, because of its shallow water body, has already amply demonstrated the extensive damage that the water hyacinth is capable of inflicting in a short period of time. However, little remedial action has been initiated so far. 27/

54. A single country can for obvious reasons not expect to successfully control the water hyacinth in its own sector of the lake. Effective control has to involve all three riparian countries (Kenya, Tanzania and Uganda) and possibly Rwanda and Burundi. The latter two countries serve as "hosts" for water hyacinth entering Lake Victoria through river Kagera. 28/ Regional cooperation on resolving the water hyacinth problem is therefore imperative.

55. The design of a control program has to consider two basic questions: the choice of control technology and organization of program implementation. With regard to technology, the options for controlling water hyacinth involve manual, mechanical, chemical and biological methods or combinations thereof. 29/ International experience

26/ This was emphatically concluded at the Jinja Conference in August 1992 and in the meeting of Government representatives in Dar Es Salaam in October, 1992.

27/ An UNDP/FAO Consultant (Mr. K. Thompson) visited Uganda in 1991 to assess the water hyacinth infestation and formulate a national action plan and project proposal. A National Workshop on the Water Hyacinth in Uganda was held in Uganda in October, 1991. These efforts resulted in the preparation of a proposal for a US\$ 1.5 million 4 year national (Uganda) project "Water Hyacinth Control in Lake Kyoga and Lake Victoria". Action on this proposal by the donor side has been delayed pending the development of a workable regional approach to a Lake Victoria control program. More recently, FAO has been discussing with the riparian Governments and Rwanda the possibility of support under its Technical Cooperation Programmed for the preparation of a 4-5 year project to establish technically sound system of water weed control in East Africa and to introduce biological control of the water hyacinth in the sub-region.

28/ It needs to be ascertained whether it would be possible to sufficiently control the inflow of water hyacinth plants from the river Kagera mouth into Lake Victoria so that successful actions on part of Kenya, Tanzania and Uganda to control the weed in the Lake Victoria itself could be sustained even if Rwanda and Burundi would not participate in a regional weed control program.

29/ Biological control programs involving Amazonian weevils have been tried with good results in the Nile waters south of Khartoum in the late 70s and early 80s (biological controls facilitated the phasing out of the chemical control programmed, but continue to rely extensively on mechanical and manual control methods). Biological control programs in Australia (Commonwealth Scientific and Industrial Research Organization) are

confirms the effectiveness of biological control. An FAO Weed Control Specialist examining in detail the Lake Victorian infestation problem in 1991 concluded that the introduction of weevils will be the long run solution to control water hyacinth across large areas of its distribution in Uganda. ^{30/} Any introduction of natural enemies of the water hyacinth must, however, be done with extreme care. As experience elsewhere in the world has shown, not all effects (some detrimental) of such an introduction can be predicted with absolute certainty. Manual and mechanical methods are likely to be necessary but extremely costly (based on Sudanese experience) in the short to medium term to address situations where "landing sites, fishing grounds, navigation channels and water supply intake points must be protected from being choked off by hyacinth mats". ^{31/}

56. In theory, utilization of the water hyacinth has high potential as a means of control. ^{32/} The practical viability must be examined carefully in individual cases (the cost of harvesting the plant often being the prohibitive factor). With regard to the organization of program implementation, a key feature of any control program would be to ensure local community involvement and "ownership" in the planning, implementation and maintenance phases of the program. Without it, the sustainability of any effort may simply not be possible. A Government Fisheries Department while needed to help plan controls and extend technology cannot be relied upon to carry out all control activities.

reporting good results in respect to large infestations and infestations in permanent waters. Similarly, biological control programs in the Southeastern United States (US Department of Agriculture) are also credited as meeting with good results, and biological control through introduction of insects are increasingly taking over the traditional controls through mechanical and chemical methods. Also, successful biological control of water hyacinth has been reported in Argentina and India. In Egypt (Research Institute of Weed Control and Channel Maintenance), adequate results of a program to control water hyacinth in irrigation canals were obtained from a combination of mechanical, chemical, biological (grass carp) and manual means.

^{30/} The Ugandan Ministry of Agriculture and Livestock has already initiated a research program at its Kawanda Research Station supporting the future introduction of weevils for biological controls of water hyacinth.

^{31/} Draft Terminal Statement on FAO/TCP/UGA/9135A "Uganda Water Hyacinth Surveillance and Control in Uganda", April 1992.

^{32/} Theoretically water hyacinth may be used as livestock fodder, for potash production, as a compost and mulch, and for paper and biogas. However, due to its chemical composition, it is a very poor fodder for livestock and would have to be mixed with other substrates. Therefore, it would appear that possible (e.g. economically viable) uses would be those using the plants' biomass, especially for biogas production, and as potassium rich compost/mulch.

57. It is necessary, therefore, that the three riparian Governments on Lake Victoria initially cooperate in a program to seek out optimum control technology, including the evaluation of utilization as a control strategy element, establish the necessary technical, environmental and institutional conditions for the "safe" use of biological controls, and to test various models, including incentive schemes, for involving local communities.

Component Activities

58. The program component would include two main activities: (1) coordination of national policies for wetlands management, and (2) preparation and implementation of a regional program to control the water hyacinth infestation.

59. **Coordination of National Wetland Policies and Regulations.** Promote regional coordination of the implementation of wetland policies related to Lake Victoria and integration of wetland management policies and programs with management strategies for other resource uses (fisheries, lake pollution).

60. Next steps could be as follows:

- (a) As part of ongoing or planned National Environmental Action Plans Governments should adopt national policies for management of wetlands.
- (b) A coordinating mechanism would be established to (1) serve as a focal regional point for exchange of views and experiences related to wetlands research and policy formulation, and (2) help coordinate implementation among riparian countries of national wetland policies and pertaining to Lake Victoria. Such a mechanism could be a regional committee for Lake Victoria wetland management and development consisting of senior governmental planners and resource managers, and scientists from the universities of the region.
- (c) At the regional level objectives, policies and programs for management of wetlands should be coordinated with those for other resource uses.

61. **Regional Program to Control the Water Hyacinth Infestation.** As a top priority a phased regional program needs to be prepared to control the infestation of water hyacinth and to seek the participation of Rwanda and Burundi. The first phase of this program should be initiated with a minimum of delay.

62. Action to this effect would involve the following steps:

- (a) Building on existing preliminary proposals presented by various donors and Government of Uganda agencies, a comprehensive draft Water Hyacinth Control Program should be prepared to be submitted to Governments and donors for consideration at a meeting as early as possible in 1993.

- (b) The action program could be split into two phases:
 - (i) A first phase of up to two years would involve a series of pilot subprojects for testing and evaluating in the local context water hyacinth removal technologies (manual, mechanical, biological or chemical) or strategies (e.g. utilization vs. elimination of the plant), and approaches and incentive systems to involve lakeshore communities. This first phase would also establish the necessary technical and organizational arrangements for supporting biological controls (testing, production and release of weevils). The subprojects would be carried out in selected areas around Lake Victoria, and with the involvement of all riparian countries.
 - (ii) During a second follow up phase results from the pilot phase would be applied in an expanded program which gradually would reach full lake coverage, with national removal control programs in all three countries, while at same time intensifying regional cooperation with Rwanda and Burundi on the control of the Kagera River which is the source of inflow of the weed into Lake Victoria.
- (c) The necessary cooperative agreements with international organizations and research institutes with experience in water weed eradication should be established.

D - Management of Land Use in the Catchment

Background

63. The present and potential impact of land use and farming systems in the lake's catchment on the characteristics of the water body has been referred to above. Of special concern is the Kenyan part of the catchment, since most of the rivers in the basin flow into the lake through Kenyan territory. But it is throughout the lake basin that agricultural and other development activities, which affect land use, impact the lake environment and the users of the resources of the lake. However, the precise nature and extent of the interdependencies are not yet known. Given the present and shared concerns over the state of the lake environment, this information gap needs to be filled, thus suggesting an immediate area of regional cooperation.

64. From the standpoint of integrated basin management, a regionally coordinated research program needs to focus on two key questions:

- (a) First, under present land use farming practices, what is the extent of external costs imposed by land users in the catchment on users of other lake basin resources within and outside the national confine?

- (b) Second, in considering agricultural and other land related development programs for various parts of the catchment, what changes can be introduced in land use practices that will result in a "win-win" situation, i.e. where land users as well as lake users benefit?

65. It seems that the higher the costs imposed on external resource users, given present practices and the lower the probability to find "win-win" strategies in inducing change to such practices, the greater is the justification for formally including the management of land use in the catchment under a regional program for environmental management of the lake basin.

Component Activities

66. The program component would include two items: (1) coordination of national planning for catchment development, and (2) improvement of the management information base

67. **Coordination of National Planning for Catchment Development.** A formal regional coordination in policy formulation and catchment development is likely to be premature. Yet there is a need for a forum to be created through which catchment planners from the three countries can consult and advise on development or management proposals, conduct joint reviews of development efforts, and generally exchange views on catchment development, particularly as it relates to the environmental health of Lake Victoria.

68. A useful next step, therefore, would be to set up a regional consultative group on Lake Victoria catchment development. Since the Kagera River accounts for one fourth of the total inflow of water in Lake Victoria, such a group needs to include representatives from Rwanda and Burundi. Such cooperation could be solicited through the Kagera Basin Commission, in which Tanzania as well as Rwanda and Burundi are participants.

69. **Improvement of the Management Information Base.** The objective is to establish and implement a regionally coordinated research program to map the various key technical, economic and social aspects of the impact of land uses and practices in the catchment on the users of the lake resources. Such mapping will depend *inter alia* on an improved understanding in the following two areas:

- (a) the nature of land use and the processes by which particular land use practices in various sections of the catchment generate silt, nutrients, and toxic matter for delivery to the shores of the lake; and
- (b) the processes by which these substances are transported throughout the lake, the resulting changes in the lake environment and the quality and stock of the lake's living resources, and their impact on fishermen, urban

and rural water suppliers and consumers as well as the preservation of biodiversity.

70. Next steps could therefore include the following:
- (a) Identification at the national level of ongoing or potential research projects on areas related to land use in the catchment, and of the public and private sector organizations/institutions involved in such research; determination of how these national research programs could be enhanced, modified or supplemented by research in various areas, including those of fish biology and limnology, to address the salient questions with regard to impacts on the users of lake resources.
 - (b) Establishment and support for national focal points for undertaking this work and carrying the process further.
 - (c) Use of the regional consultative mechanism referred to above (para.67) to
 - (i) coordinate programming of and support for national research efforts related to land use in the Lake Victoria catchment;
 - (ii) encourage regional exchange of research results; and
 - (iii) promote exchange of views and experience on salient topics with other regional basin authorities in the region.

D. Institutional Arrangements

71. The basic idea behind a program along the lines outlined above is to foster a process of dialogue, consultation, cooperation across national boundaries and interests. Without such a process the establishment of rational regional policies, adoption of regulatory measures, and coordination of the implementation of such measures under national programs will not materialize.

72. The institutional arrangements need to be sensitive to this idea. Hence, they need generally to allow for a transparent and participatory approach in reviewing issues, examining strategy alternatives and formulating program content. It would also be prudent to keep the institutional arrangements for designing and implementing the program as simple as possible, and to avoid large top-heavy regional bureaucratic structures. Involvement in an advisory capacity of international planners, resource managers and scientists bringing relevant outside perspectives and experiences to the Lake Victoria program should be actively pursued. Institutional arrangements of a more formal and permanent nature will probably best evolve from experience and as a result of the cooperative process itself.

73. Possible organizational arrangements of program implementation have been suggested under the discussion of program components and activities in Part C. Governments in the lake region have already moved to establish a Joint Fisheries Commission. If properly mandated and established, this Commission would be the regional mechanism for the implementation of the regional fisheries management program. The other components would need to be implemented through a combination of national (technical) focal points and regional coordinating committees (senior technical representatives). As suggested in Part C, these regional coordinating/consultative committees would involve two coordinating committees under the proposed Fisheries Commission (the Science Committee and the Fisheries Management Committee), and three regional committees related to lake pollution and water quality control, wetland management and development, and catchment development.

74. Such a structure would need to be supported by an umbrella mechanism for regional coordination to ensure the integration of program components and to provide for accountability to some inter-governmental body with a mandate to oversee the process of regional coordination and to ensure that joint regional decisions are followed up for implementation at the national level.

E. Program Costs and Funding

Costs

75. A very rough estimate of the cost of a 3-4 year program as outlined above would be in the range of US\$ 20 million (investment and incremental recurrent costs). An indicative first breakdown by program components would be:

- (a) US\$ 6 million for the fisheries management component, including establishment and annual operating costs for the proposed fisheries commission, support for fisheries related studies and research, and institutional support to national fisheries administrations;
- (b) US\$ 4 million for the lake pollution and water quality control component, including establishment and operating costs for a regional water monitoring system, support to national water law enforcement agencies, but excluding costs of national investments in pollution abatement;
- (c) US\$ 6 million for the management of the wetlands component, with the bulk for the first pilot phase and the preparation of the second phase of the regional program to control the water hyacinth infestation;

- (d) US\$ 1.5 million for the management of land use in the catchment component, including studies and regional coordination of planning related to land use in catchment; and
- (e) US\$ 2.5 million for institutional support for the overall regional coordination of the program.

76. About a quarter of the above program costs would relate to regional coordination activities of various kinds (the proposed Fisheries Commission, regional coordination committees, a coordination unit for overall regional program etc). One would expect that about half of the costs would be attributable to the implementation of regional projects, primarily focused on helping riparian partners jointly find optimum solutions to shared management problems (pilot projects, regional studies and research projects). Another 25 percent of program costs would be for implementation of national projects, such as strengthening of national environmental/natural resource management agencies.

Sources of Funding

77. Funding of the program would come from the three Governments (budgetary contributions) and the international donor community. The commitments by the Governments to jointly resolve environmental management priorities for Lake Victoria would need to be demonstrated through agreements on contributions to the funding of the initial costs of establishing and operating the program. While it is expected that external funding would be required for incremental recurrent costs incurred under the program, these contributions would need to be phased out over a period of 4-5 years as Governments assume full responsibility for funding the program and sustain it in the longer run.

78. The mission considers that the program should be submitted to the Global Environment Facility for consideration of funding an appropriate share of those program costs that relate to regional coordination and regional project implementation (regional water quality monitoring and water hyacinth control). This would appear justified given that

- (a) Lake Victoria is a shared water body (ref. GEF's project category for management of international waters);
- (b) the establishment of a regional cooperative framework is critical to riparian Governments implementing rational management practices (since a regionally coordinated environmental management program is expected to generate greater benefits than the sum of individual country programs); and that

- (c) the program has the potential to significantly contribute to the preservation of biodiversity (this, again, would be enhanced by effective regional coordination).

79. The mission is convinced that a comprehensive and realistically targeted program for environmental management of Lake Victoria prepared and "owned" by the three riparian Governments would meet with considerable interests among international financing agencies. An early indication of likely GEF involvement would serve to enhance such interests.

F. Next Steps

80. If there is a consensus among the three riparian Governments that the broad outline of the proposed program is a helpful starting point, the following actions would help to facilitate program preparation and the subsequent process of securing funding:

- (a) **Regional Anchoring of Program Preparation.** A joint Government mechanism to coordinate program preparation is required. An Intergovernmental Task Force on Preparation of a Regional Program for Environmental Management of Lake Victoria would be established. The three Governments would each nominate one member drawing as they wish from the NEAP processes (action to be taken by January 31, 1993). A regional seminar on Regional Priorities for Environmental Management of Lake Victoria, involving Government officials, scientists, donors, and NGOs may be helpful to kick off the work of such a Task Force
- (b) **Task Management and Initial Funding.** The proposed Task Force, supported by the necessary technical assistance complement, and working with a joint World Bank/UNEP Task Management would assume overall responsibility of program preparation. In the initial stages such preparation will involve national task forces/working groups, expected to be largely drawn from the present arrangements for preparation of National Environmental Action Plans. Appropriate and early arrangements for funding the work of the regional and national task Force would need to be secured.
- (c) **Early Involvement of Donor/Technical Agencies Community.** Special and early arrangements would be made to closely involve donors and the relevant UN Technical agencies as well as key NGO's such as IUCN in the preparatory process. In particular, it will be essential to secure FAO's technical involvement in the preparation of the program, with emphasis on components related to Fisheries Management and Management of Wetlands.

81. The mission will recommend to World Bank management and UNEP management that following Government nominations for membership of the Intergovernmental Task Force, a first preparation mission be fielded to agree on contents, work schedule and organizational arrangements for program preparation. The target date for such mission would be February 15, 1993.

Washington, D.C. and Nairobi
December 14, 1992

Annexes

- I. List of Documents Received by Mission
- II. Agencies contacted and Persons Met

Annex I

Inventory of documents received during the mission

I Project Proposals

- 1) Lake Victoria Aquatic Resources Research Project (Phase II of an EEC project being completed), (UFFRO).
- 2) a) Proposed Lake Victoria Fisheries Commission; a Review of Historical Trends and Guidelines for the Future (by Mr. Sichone, former Commissioner of Fisheries, Tanzania).
b) Draft Convention on the Establishment of the Lake Victoria Fisheries Commission.
- 3) Nabugabo Cichlid Conservation Project (UFFRO).
- 4) Water Resources Management Policy and Institutions in the Lake Victoria Region (FAO).
- 5) A Proposed Study of Euhydrophytes and Associated Phytophilous Macroinvertebrates in the Nymphaea Swamps of Kisubi Bay, Lake Victoria (University of Makerere).
- 6) Project Proposal for a Biological Control Programme for Water Hyacinth in Africa (International Institute of Biological Control).
- 7) a) Water Hyacinth Control in Lake Kyoga and Lake Victoria (UNDP/FAO?).
b) Draft Proposal for the Technical Co-operation Project "Water Hyacinth Control in East Africa"
- 8) Project Profiles: Lake Victoria Fisheries Research and Management (this is a collection of 9 project proposals which were discussed and endorsed by senior fisheries officials of the three riparian countries during a recent meeting in Dar es Salaam).

II Reports

- 1) Lake Victoria Fisheries Research Vessel, Review and Proposals (Mac Alister, Elliott & Partners).
- 2) National Environment Action Plan for Uganda:
 - a) Topic Paper on Water Resources, Wetlands, Aquatic Biodiversity and Irrigated Agriculture;
 - b) Issues Paper on Wetlands, Water Resources, Fisheries, Aquatic Biodiversity and Irrigated Agriculture;
 - c) Environment Issues Pertaining to Mining, Industry, Toxic Chemicals and Hazardous Materials.

- 3) Project fact sheet of EEC project "Lake Victoria Aquatic Resources Research Project", Phase I).
- 4) Pages 13 and 31 of EEC Annual Report 1991, describing briefly EEC fisheries projects in Uganda.
- 5) Water Hyacinth Surveillance and Control in Uganda. Terminal Statement of the Project (FAO/Government of Uganda).
- 6) Brief on FAO Lake Victoria/Water Hyacinth Activities.
- 7) The Water Hyacinth in Uganda. Ecology, Distribution, Problems and Strategies for Control. Proceedings of a National Workshop, 22-23 October, Kampala (FAO/Government of Uganda).
- 8) Water Hyacinth Surveillance and Control in Uganda (Keith Thompson/FAO).
- 9) Programme of a regional symposium on applications of biotechnology and aquaculture to the cultivation, sustenance and improvement of aquatic species in Lake Victoria and other East African Lakes, to be held from 6-11 December 1992, (or later) in Kisumu (Maseno University College).
- 10) The fisheries of Lake Victoria: Review of basic data (Greboval and Mannini; UNDP/FAO Regional Project for Inland Fisheries Planning, Development and Management in Eastern/Central/Southern Africa).
- 11) Project Document "Institutional Support for the Protection of East African Biodiversity" (UNDP/FAO/Governments of Kenya, Uganda, Tanzania).
- 12) Briefing Paper on Environmental Activities of the Lake Basin Development Authority, Kisumu.
- 13) The Study of Integrated Regional Development Master Plan for the Lake Basin Development Area (Lake Basin Development Authority/JICA).
- 14) Resolutions of the Workshop on People, Fisheries, Biodiversity, and the future of Lake Victoria, held at Jinja in August 1992.
- 15) Course Programme for obtaining a M.Sc. Degree in Hydrobiology at University of Makerere.
- 16) 1 Videotape on the spreading of Water Hyacinth in Uganda.

III Scientific Papers

- 1) Ogutu-Ohwayo, R. (1990): The decline of the native fishes of Lakes Victoria and Kyoga (East Africa) and the impact of introduced species, especially the Nile Perch, *Lates niloticus*, and the Nile Tilapia, *Oreochromis niloticus*. In: *Environmental Biology of Fishes* 27, p. 81-86.
- 2) Oguto-Ohwayo, R. (1990): The reduction of fish species diversity in Lakes Victoria and Kyoga (East Africa) following human exploitation and introduction of non-native fishes. In: *Journal of Fish Biology* 37 (Supplement A), p. 207-208.
- 3) Oguto-Ohwayo, R.; Hecky, R. (1991): Fish introductions in Africa and some of their implications. In: *Canadian Journal of Fisheries and Aquatic Sciences* 48, Supplement 1, p. 8-12.
- 4) Twongo, T.; Bugenyi, F.; Wanda, F. (1992): The potential for further proliferation of Water Hyacinth in Lakes Victoria and Kyoga and some urgent aspects for research. Paper presented at CIFA Sub-Committee for Management and Development of the Fisheries of Lake Victoria, 6th session.
- 5) Kaufman, L. (1992): Catastrophic Change in Species-Rich Freshwater Ecosystems; the lessons of Lake Victoria.
In: *BioScience* Vol. 42 No 11.

Annex II

Persons met by joint World Bank/UNEP missionI Uganda

- 1) At National Environment Action Plan Secretariat, Kampala:
Mr. H. Aryamanya-Mugisha, NEAP co-ordinator; Mr. T. Twongo, researcher; other staff.
- 2) At Ministry for Agriculture, Animal Industry and Fisheries, Entebbe:
Mrs. V. Sekitoreko, Minister for Agriculture, Animal Industry and Fisheries.
- 3) At Department of Fisheries, Entebbe: Mr. E. Kanyike, Commissioner for Fisheries; Mr. F. Orach-Meza, Deputy Commissioner for Fisheries; Mr. C. Dhatemwa, Assistant Commissioner for Fisheries.
- 4) At HYDROMET project headquarters, Entebbe: Mr. M. Tawfik, Project Director, and staff.
- 5) At Water Development Department, Kampala: Mr. P. Kahangire, Deputy Commissioner for Water Development; Mr. J. Karundu, Officer for Rural Water Supply; Mr. Nsubuga-Senfuma, Senior Chemical Analyst; Mr. J. Odul, Assistant Commissioner for Water Resources.
- 6) At Ministry of Labour & Social Welfare, Kampala: Mr. Ogaram, Commissioner for Occupational Health; Mr. J. Otim-Ogwal, Deputy Commissioner of the Factory Inspectorate.
- 7) At Ministry of Environment, Kampala: Mrs. Ocaya-Lakidi, Permanent Secretary for Environment.
- 8) At Uganda Freshwater Fisheries Research Organisation headquarters, Jinja: Mr. D. OcenOdongo, Deputy Director; Mr. C. Odongkare, fisheries economist; Mr. R. Ogutu-Ohwayo, researcher, Mr. J. Obbo Okaronon, researcher;
- 9) At EEC Res. Rep. Office: Mr. P. Mikos, Rural Development Adviser.
- 10) At Danish Embassy: Mr. G. Andersen, Charge d' Affairs.
- 11) At University of Makerere,
 - a) Department of Zoology: Mr. P. Kasoma, Head of the Department
 - b) Institute of Environment: Mr. E. Kateyo, scientist.
- 12) At FAO Res.Rep. Office, Kampala: Mr. A. Khalil, FAO Res. Rep.; Mr. H. Aaskov, Programme Officer.

mechanism and approach for developing and promoting regional coordination. Initially they would be consolidated under some form of project administration unit or project secretariat which would be responsible for overall program coordination but would not get involved in detailed technical management. Eventually this administrative unit should evolve into a permanent secretariate for the regional program.

6. The approach to developing regional coordination would likely be somewhat different across the four thematic areas. For example, regional coordination has already been initiated in the area of fisheries management, with the agreement in principle to establish a regional Fisheries Commission. Similarly, there has been some discussion and regional and international collaboration in highlighting the problem of pollution and water quality management, with several meetings of concerned scientists already. The aim of the GEF project in such cases would be to foster these initiatives and assist them to grow into effective regional programs with appropriate institutional frameworks. This is likely to include support to regional activities such as consultative meetings and networking, lake-wide data collection, analysis and management, and harmonization of regulations (eg. common water quality standards) as well as support for building national regulatory capacity which is essential for countries to be able to implement regional agreements. Both external reviewers stressed the importance of GEF support for research, particularly by investigators from the region. GEF could also support the identification of the elements of national investment programs, to be funded by governments with conventional bilateral and multilateral development assistance. In the areas of wetlands management, water hyacinth control and catchment land use management overall, there is as yet no incipient regional initiatives, and regional benefits will largely be a result of improvements in resource management practices within each country. In this case, the GEF project should focus on providing incremental support for appropriate national activities, particularly the relevant task forces and working groups operating within the framework of the National Environmental Action Plan currently under development in each of the three countries. By helping to make regional issues involving Lake Victoria in the national agenda and planning efforts, the GEF can lay the groundwork for later regional cooperation in these areas as well. The GEF could also support pilot activities (e.g. as proposed for water hyacinth control) to test approaches and stimulate later investment by governments and bilateral donors.

7. The meeting provided some recommendations for the next phase of project preparation, in terms of orientation, organization and resources. The main points are summarized as follows:

- (1) All noted that, in view of its complexity, this project will require very significant resources for preparation, appraisal and particularly supervision (considerably above the levels normally provided for Bank projects).
- (2) It was agreed that the project must continue to be driven by regional actors and institutions, with external technical support as needed. In view of the complexity of the proposed program (technical, institutional multi-national aspects), a full-time onsite coordinator will be needed to assist the preparation phase, particularly organizing and guiding national and regional task forces.
- (3) Attention should be given to involving regional/pan-African organizations such as the African Development Bank during the preparation phase. However, it should not be necessary to involve the Nile Basin Commission (i.e. downstream riparian states) as there will be no issues of water allocation involved.

Environmental Aspects

16. An environmental assessment of the proposed project would be carried out prior to appraisal, consistent with Bank procedures. The assessment is expected to flow out of the work (to be initiated) of the national working groups and regional task force on fisheries management, lake pollution and water quality control and land use in the riparian zone and catchment.

Program Benefits

17. A regionally coordinated environmental management program is expected to generate greater benefits than the sum of individual country programs, since it reduces uncertainty in respect to actions by riparian partners and lowers the probability that benefits of actions taken by an individual Government will be offset by actions or non-actions taken by others. Economic and social benefits would be directly linked to the implementation of the regional management program. The latter would be expected to generate (a) increased economic benefits from higher sustainable yields from lake fisheries, (b) reduced costs of other resource users (safe drinking water to urban areas, transport, power generation), (c) diminished incidence of disease among riparian communities as a result of improved quality of water and sanitary environment, and (d) greater biodiversity, producing benefits to local communities, tourists and the global community, all compared to a "non-program" situation.

Risks

18. The main risk is that the strength of the commitments by the three Governments will fail to sustain a regional environmental management program for the lake basin. This may express itself through inadequate budgetary arrangements to fund regional regulatory bodies (fisheries commission) or coordinating agencies, erosion over time of the powers given to such institution, or unwillingness or lack of capacity to follow-up on regional regulatory decisions or guidelines through enforcement at the national level. Project design will need to adequately address these risks along the lines suggested above.

Preparation

19. Program and preparation will build on the NEAP processes underway in the three countries. The participatory and phased approach will start with national working group proposals for a Lake Victoria environmental management program and evolve into regional proposals through regional task forces. While such a preparatory initiative would be firmly anchored within the region and with national focal points, the process would be supported by the community of donors, NGOs and international scientists.

Staff Review Arrangements

20. Staff responsible for program preparation, review and supervision are as follows:

Task Manager	Lars Vidaeus, AF2AE
Department Director	Francis X. Colaco, AF2DR
Division Chief	Sushma Ganguly, AF2AE
Peer Reviewers:	To be selected.

Project Sustainability.

12. The sustainability of a regional management program for Lake Victoria hinges on a political commitment on part of the three Governments to work together. It also depends on financing of the program beyond the duration of the project. The political commitment is outside the control of the project. However, the emphasis of the project is on supporting processes that foster collaboration and joint decision making. As such, it should help strengthen the commitments of the riparian partners to the program. Regarding financing, it is expected that external funding would be required for incremental recurrent costs incurred under the program. These contributions would need to be phased out over the project period as Governments assume full responsibility for funding the program and sustain it in the longer run.

Rationale for GEF Funding.

13. The project fits four out of six GEF criteria for project eligibility (minimum of two required) in respect to the objective of protection of international waters. More generally, GEF funding is justified because (a) concessionary funding would lower the perceived costs to the riparian partners of establishing a regional cooperative framework for management of the lake basin, thereby paving the way for rational management of the lake environment as a "common pool"; (b) the benefits from improved management would extend to the global community through enhanced preservation of biodiversity; (c) it would catalyze donor support for a realistically targeted management program that is prepared and "owned" by the three riparian Governments, with this catalytic impact extending to donor support for national follow up investments in areas such as municipal sewage collection and waste water treatment; (d) the regional cooperative approach to integration of management of conflicting resource uses within a lake ecosystem should have important replicability; and (e) successful project implementation would boost regional cooperation between the three Governments in other areas, thus enhancing regional economic benefits beyond the immediate project scope.

Issues and Actions

14. The immediate task is to build consensus among the three Governments on a project supported regional management program within the scope and along the lines outlined above. A key task will be to seek agreement on the technical priorities of the program and an appropriate balance between early management actions with tangible benefits and investments in enhancing the knowledge base for management. Support for this process has to be coordinated between GEF partners (World Bank, UNEP and UNDP), the FAO, and key bilateral donors with strong involvement in environmental planning or management in the three countries.

15. In addition two important issues need to be reviewed and agreed upon by the three Governments during further preparation and processing. First, to ensure incentives for sustainability, the Governments will need to demonstrate a commitment to a cooperative management framework through appropriate contributions to the funding of initial investment costs and gradual assumption of full funding of the recurrent costs of the program. At the latest, this would require agreements at negotiations latest on cost sharing between Governments and budgetary provisions to assume full recurrent cost financing. Second, agreement has to be sought at the time of appraisal on detailed institutional arrangements for regional coordination and links to national implementation mechanisms (also including the role of an international advisory panel of scientists and resource managers).

managers have increasingly warned that the absence of a regional management framework may threaten the future viability of the lake basin. A first step toward establishing such a framework was taken in October 1992 when the three Governments agreed in principle to establish a Lake Victoria Fisheries Commission. This initiative now needs to be broadened to encompass environmental management of the Lake Victoria basin.

5. The objectives of a Regional Program for Environmental Management of Lake Victoria would be to maximize the benefits to riparian communities from using resources within the basin to (a) generate food, employment and income; (b) increase value added from the development of export oriented fish processing; (c) supply safe water and a disease free environment; and (d) conserve biodiversity and genetic resources. Pursuit of these objectives involves significant trade-offs. While the lake basin ecosystem remains less than fully understood, it is clear that human settlement and associated food production systems in the riparian zone adversely affect the biological environment supporting fish production. Dumping of untreated waste into the lake passes on costs to fishermen. Preservation of biodiversity may require giving up short-term production gains. Conflicts of this nature cut across national boundaries. A regional management framework is needed to harmonize management objectives between countries and resources uses. Against the backdrop of such a framework, individual riparian countries would have the incentive to implement management programs within their respective sectors that aim to reverse the ongoing environmental degradation.

Project Objectives

6. The project would provide a vehicle or a process which the Governments of Kenya, Uganda and Tanzania would use to (a) establish and begin implementing a regional program to manage fisheries, lake pollution and land use in the wetland, focusing on the water hyacinth as a pressing priority, and the catchment, and (b) strengthen national resource management institutions which would be required to implement a regional program. As a consequence, the project would pave the way for or enhance the benefits of national investment programs and projects related to management or development of the resources of the lake basin. Project success would be largely measured in terms of how effectively it will foster regional cooperation on management questions, generate regional solutions to joint problems, promote inter-country dialogue on development planning in relationship to the lake basin, and encourage exchange of scientific information. The objectives thus defined fall within GEF's generic criteria for protection of international waters as well as of biodiversity. The former criterion is proposed as the operative one for the project, given the significance of transboundary issues in the management of the lake ecosystem.

Project Description.

7. The project would support the following specific regional program activities: (a) fisheries management, involving the establishment and operations of a lake fisheries commission; improvement of the information base for fisheries management (fisheries and fisheries related research, fish population assessments and surveys, the socioeconomic environment of the artisanal fisheries); and strengthening of extension, monitoring and enforcement capabilities of national fisheries administrations; (b) management of lake pollution and water quality, including strengthening and harmonizing national regulatory and incentive frameworks; enhancing national enforcement capabilities; improving the information base for controlling lake pollution and water quality (establishing a lake wide water quality monitoring system); and programming (but not financing the implementation of) investment requirements; (c) management of wetlands, including coordination of national policies and regulations; a pilot project to demonstrate the feasibility of

maintenance of water-based biodiversity, (c) develop lake basin wide monitoring and inventories of pollution resources, and (d) facilitate the establishment of management plans for pollution reduction.

7. **Sustainability.** The sustainability of a regional management program for Lake Victoria hinges on a political commitment on part of the three Governments to work together and on financing of the program beyond the duration of the project. The political commitment is outside the control of any project, but the proposed project supports processes that foster collaboration and joint decision-making. It is expected that external funding would be required for incremental recurrent costs incurred under the program. These contributions would be phased out over the project period as Governments assume full responsibility for funding the program and sustain it in the longer run.

8. **Monitoring and Evaluation.** Monitoring and evaluation of the implementation of an environmental management program for the Lake Victoria Basin would be facilitated by the very monitoring systems and programs related to fish production, water quality, and pollution sources that the project will help establish. Institutional arrangements for project design will involve international lake ecosystem scientists, resource managers, and NCOs in a transparent process of evaluating the progress made in reversing the environmental degradation.

LV/GEF/crt
December 30, 1992

THE WORLD BANK/IFC/M.I.G.A.

Headquarters: Washington, D.C. 20433 U.S.A.

Tel. No. (202) 477-1234 // Fax Tel. No. (202) 477-6391 // Telex No. RCA 248423

FACSIMILE COVER SHEET AND MESSAGE

DATE: May 20, 1993

NO. OF PAGES:
(including this sheet)

MESSAGE NUMBER: \

TO

Name: Mr. Stephen O'Brien
Organization: Chief, Regional Mission in Eastern Africa

Fax Tel. No. \
City: Nairobi
Country: Kenya

FROM

Name: Sushma Ganguly *SG*
Dept./Div. AF2AE
Room No. \

Fax Tel. No. 202-477-0515
Dept/Div No. 224/20
Tel. No. \

SUBJECT: Environmental Management of Lake Victoria

MESSAGE:

1. Attached is a letter addressed to Mr. Okeyo, Permanent Secretary Environment, with a copy of the Aide-memoire of the World Bank/UNEP/FAO mission that visited Kenya, Uganda and Tanzania in March this year.
2. The letter proposes a meeting of the three Governments in Nairobi June 21-23 (UNDP has agreed to host) with the objectives for the Governments to: (a) agree on a collaborative mechanism for preparing an environmental management program for Lake Victoria, and (b) take the necessary steps to jointly ask donors (incl. GEF) for preparatory funding assistance.
3. The proposed meeting would be the first test of the commitments of the Governments to moving this initiative forward. Two consecutive Bank missions have paved the way so far. It is now up to the three Governments to take the next steps. As you realize we need to make a sincere effort to bringing delegations from the three countries together on the proposed dates. Hence UNDP has graciously agreed to foot the bill for travel and accommodation for the Government delegations.
4. We therefore ask for your/Gajan's kind assistance in (a) ensuring that the letter with the attached Aide-Memoire reaches Mr. Okeyo with minimum delay to allow maximum time for Government to review of the attached documentation, (b) impressing on Mr. Okeyo through direct personal communication the significance of this meeting and the need for an early reaction to the proposal for the June 21-23 meeting. In brief, we need to have a response whether the Kenyans are prepared to participate in the meeting and who the participants are likely to be. May we also ask Gajan through copy of this letter to distribute copies of the attached letter to addressees as marked on the attached page.
5. Would be grateful if you could treat this as a matter of high priority and urgency.

cc. Pathmanathan, Kiss

Transmission authorized by: Sushma Ganguly *Sushma Ganguly*

May 20, 1993

Mr. Michael G. Okeyo
Permanent Secretary
Ministry of Environment and Natural Resources
Nairobi, Kenya

Dear Mr. Okeyo:

Re. Lake Victoria Environmental Management Program

A joint World Bank/UNEP/FAO mission comprising Messrs. B. Nekby, G. Schneider, J. Kapetzky and D. Greboval visited Kenya, Tanzania and Uganda in March to hold discussions with Government officials on the subject of preparation of a regional program for environmental management of Lake Victoria. The mission followed up on the earlier deliberations that a World Bank/UNEP mission last November held with Government representatives, resource managers, scientists and the donor community.

We would like to thank you for the cooperation and assistance you and representatives of your Government extended to the mission. In particular, we are pleased to note from the mission's Aide-Memoire (attached) that there now seems to be a strong consensus emerging on the objectives and scope of an environmental management program for Lake Victoria. On the basis of such a consensus, the next step would be for the three Governments of Kenya, Tanzania and Uganda to launch a collaborative effort to prepare a management program.

The mission held extensive discussions with representatives of all three Governments on this matter. It has prepared an outline of substantive points to be covered under an agreement between the three Governments to jointly prepare an environmental management program for Lake Victoria (Annex II of the Aide-Memoire). This outline with its attachments covers objectives, organization, responsibilities, resource requirements and a preparation schedule. While the outline remains under review, we believe that it is sufficiently comprehensive to merit detailed considerations by the three Governments as a modus operandi for proceeding with the planning of program preparation. A draft agreement addressing the substantive points outlined in Annex II of the Aide-Memoire is being prepared and will be sent to you for your consideration shortly.

It is proposed that a Regional Policy and Steering Committee, assisted by a small regional secretariat, guide the preparation by Regional Task Forces of program proposals in two main areas: fisheries management and water hyacinth control, and management of water quality and land use (including wetlands). These Regional Task Forces would have broad representation from the public and private sectors, including representation from the scientific community and non-governmental organizations. They would be supported by local and international consultants. Their work would be based on proposals presented by National Working Groups coordinated by National Secretariats (linked to the NEAP or NCS secretariats currently in place).

Two consecutive donor missions have now engaged in detailed discussions with representatives of each of the three respective Governments. The response and enthusiasm shown by the three

May 20, 1993

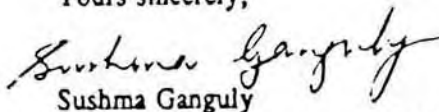
Governments have been encouraging. To build on this momentum and to initiate a process of collaboration, it is now essential that the focal points in each of the three Governments meet to discuss the next steps, namely first adopting a collaborative mechanism for preparing a regional program and, second, requesting donor assistance for the preparation of the program. We would propose that Annex II of the enclosed Aide-Memoire may serve as a starting point for such discussions, once it has been given the necessary review and consideration at the national level.

The Resident Representative of UNDP in Nairobi has kindly offered to host such a meeting in Nairobi and is prepared to extend the necessary travel and accommodation facilities for delegations from the three countries to attend the meeting. The proposed dates for this meeting are June 21 to 23, 1993. The first two days could be devoted to discussions between the three Government delegations. If convenient to the Government delegations, the third day could be used for meeting with the donor community to discuss next joint steps in getting a collaborative preparatory effort underway.

We look forward to receiving your early views and reactions to the proposal for a joint meeting by the three Governments, and have requested our Resident Representative in Nairobi to stay in touch with you on this matter. As you will appreciate the proposed meeting will only materialize if all three Governments find it convenient to meet at an agreed venue at an agreed date. To facilitate a process leading to such an agreement and the timely preparations for the meeting, we would ask for your early consideration and communication on the proposed initiative. Pleased be advised that we have sent letters, with copies of the attached documentation, proposing the joint meeting of the three Governments in Nairobi on June 21-23 to Mr. Paul Mkanga, Principal Secretary, Ministry of Tourism, Natural Resources and Environment, Tanzania, and Mr. Emmanuel Tumusiime-Mutebile, Permanent Secretary, Ministry of Finance and Economic Planning, Uganda.

Finally, let me assure you that we stand ready, together with the donor community at large, to assist you and your colleagues from Tanzania and Uganda to bring this exciting initiative to fruition. We shall be prepared to assist in any possible way to make the discussions at the proposed June meeting in Nairobi as productive as possible.

Yours sincerely,



Sushma Ganguly

Division Chief, Agriculture and Environment Operations
East Africa Country Department

Attachment

cc:

Permanent Secretary, Office of the Vice President, Ministry of Planning and National Development
Permanent Secretary, Ministry of Research Science and Technology
Permanent Secretary, Ministry of Regional Development
Director, Fisheries Department, Ministry of Regional Development

UNDP GEF Coordinator New York

4

THE WORLD BANK/IFC/M.I.G.A.

Headquarters: Washington, D.C. 20433 U.S.A.

Tel. No. (202) 477-1234 // Fax Tel. No. (202) 477-6391 // Telex No. RCA 248423
FACSIMILE COVER SHEET AND MESSAGE

DATE: May 20, 1993

NO. OF PAGES:
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MESSAGE NUMBER: \

TO
Name: Mr. C. Obidegwu
Organization: Acting Resident Representative

Fax Tel. No. \
City: Kampala
Country: Uganda

FROM
Name: Sushma Ganguly *SG*
Dept./Div. AF2AE
Room No. \

Fax Tel. No. 202-477-0515
Dept/Div No. 224/20
Tel. No. \

SUBJECT: Environmental Management of Lake Victoria

MESSAGE:

1. Attached is a letter addressed to Mr. Tumusiime-Mutebile, with a copy of the Aide-memoire of the World Bank/UNEP/FAO mission that visited Uganda, Tanzania and Kenya in March this year. Brian Falconer will deliver this letter to Mr. Tumusiime-Mutebile at the Paris meeting next week.
2. The letter proposes a meeting of the three Governments in Nairobi June 21-23 (UNDP Nairobi has agreed to host) with the objectives for the Governments to: (a) agree on a collaborative mechanism for preparing an environmental management program for Lake Victoria, and (b) take the necessary steps to jointly ask donors (incl. GEF) for preparatory funding assistance.
3. The proposed meeting would be the first test of the commitments of the Governments to moving this initiative forward. Two consecutive Bank missions have paved the way so far. It is now up to the three Governments to take the next steps. As you realize we need to make a sincere effort to bringing delegations from the three countries together on the proposed dates. Hence, UNDP has graciously agreed to foot the bill for travel and accommodation for the Government delegations.
4. While Brian will discuss matter with Mr. Tumusiime-Mutebile in Paris, may we also ask the help of the Resident Mission office in distributing as soon as possible copies of the attached letter to addressees as marked on the attached page. Most importantly, copies need to be delivered to the Permanent Secretary and the the Secretary for Environment.
5. Would be grateful if you could treat this as a matter of high priority.

Thanks for your help on this matter.

cc. Falconer, Loganathan

Transmission authorized by: Sushma Ganguly *Sushma Ganguly*

May 20, 1993

Mr. Emmanuel Tumusiime-Mutebile
Permanent Secretary
Ministry of Finance and Economic Planning
Kampala Uganda

Dear Mr. Tumusiime-Mutebile:

Re. Lake Victoria Environmental Management Program

A joint World Bank/UNEP/FAO mission comprising Messrs. B. Nekby, G. Schneider, J. Kapetzky and D. Greboval visited Uganda, Kenya and Tanzania in March to hold discussions with Government officials on the subject of preparation of a regional program for environmental management of Lake Victoria. The mission followed up on the earlier deliberations that a World Bank/UNEP mission last November held with Government representatives, resource managers, scientists and the donor community.

We would like to thank you for the cooperation and assistance you and representatives of your Government extended to the mission. In particular, we are pleased to note from the mission's Aide-Memoire (attached) that there now seems to be a strong consensus emerging on the objectives and scope of an environmental management program for Lake Victoria. On the basis of such a consensus, the next step would be for the three Governments of Uganda, Kenya and Tanzania to launch a collaborative effort to prepare a management program.

The mission held extensive discussions with representatives of all three Governments on this matter. It has prepared an outline of substantive points to be covered under an agreement between the three Governments to jointly prepare an environmental management program for Lake Victoria (Annex II of the Aide-Memoire). This outline with its attachments covers objectives, organization, responsibilities, resource requirements and a preparation schedule. While the outline remains under review, we believe that it is sufficiently comprehensive to merit detailed considerations by the three Governments as a modus operandi for proceeding with the planning of program preparation. A draft agreement addressing the substantive points outlined in Annex II of the Aide-Memoire is being prepared and will be sent to you for your consideration shortly.

It is proposed that a Regional Policy and Steering Committee, assisted by a small regional secretariat, guide the preparation by Regional Task Forces of program proposals in two main areas: fisheries management and water hyacinth control, and management of water quality and land use (including wetlands). These Regional Task Forces would have broad representation from the public and private sectors, including representation from the scientific community and non-governmental organizations. They would be supported by local and international consultants. Their work would be based on proposals presented by National Working Groups coordinated by National Secretariats (linked to the NEAP or NCS secretariats currently in place).

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May 20, 1993

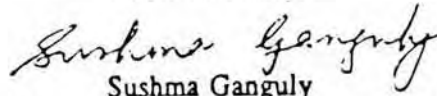
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The Resident Representative of UNDP in Nairobi has kindly offered to host such a meeting in Nairobi and is prepared to extend the necessary travel and accommodation facilities for delegations from the three countries to attend the meeting. The proposed dates for this meeting are June 21 to 23, 1993. The first two days could be devoted to discussions between the three Government delegations. If convenient to the Government delegations, the third day could be used for meeting with the donor community to discuss next joint steps in getting a collaborative preparatory effort underway.

We look forward to receiving your early views and reactions to the proposal for a joint meeting by the three Governments, and have requested our Resident Representative in Kampala to stay in touch with you on this matter. As you will appreciate the proposed meeting will only materialize if all three Governments find it convenient to meet at an agreed venue at an agreed date. To facilitate a process leading to such an agreement and the timely preparations for the meeting, we would ask for your early consideration and communication on the proposed initiative. Please be advised that we have sent letters, with copies of the attached documentation, proposing the joint meeting of the three Governments in Nairobi on June 21-23 to Mr. Michael G. Okeyo, Permanent Secretary, Ministry of Environment and Natural Resources, Kenya and Mr. Paul Mkanga, Principal Secretary, Ministry of Tourism, Natural Resources and Environment, Tanzania.

Finally, let me assure you that we stand ready, together with the donor community at large, to assist you and your colleagues from Kenya and Tanzania to bring this exciting initiative to fruition. We shall be prepared to assist in any possible way to make the discussions at the proposed June meeting in Nairobi as productive as possible.

Yours sincerely,



Sushma Ganguly

Division Chief, Agriculture and Environment Operations
East Africa Country Department

Attachment

cc: Permanent Secretary, Ministry of Water, Energy, Minerals and Environment Protection
Secretary of Environment, Ministry of Water, Energy, Minerals and Environment Protection
Permanent Secretary, Ministry of Fisheries, Ministry of Agriculture, Animal Industries, and
Fisheries
NEAP Coordinator, Ministry of Water, Energy, Minerals, and Environment Protection

May 20, 1993

UNDP GEF Coordinator New York
UNDP Resident Representative Nairobi
UNDP Resident Representative Kampala
UNEP Chief GEF Unit, Nairobi
FAO GEF Coordinator and Chief Inland Fisheries Service, Rome
FAO Representative, Kampala
EC, Uganda Desk Officer, Brussels
EC Delegate, Kampala
USAID, Regional Office Nairobi
USAID Representative Kampala
Royal Danish Embassy Kampala
World Bank Resident Representative, Kampala

THE WORLD BANK/IFC/M.I.G.A.

Headquarters: Washington, D.C. 20433 U.S.A.

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FACSIMILE COVER SHEET AND MESSAGE

DATE: May 20, 1993

NO. OF PAGES:
(including this sheet)

MESSAGE NUMBER: \

TO

Name: Mr. M. Konishi
Organization: Resident Representative

Fax Tel. No. \
City: Dar-Es-Salaam
Country: Tanzania

FROM

Name: Sushma Ganguly / *SG*
Dept./Div. AF2AE
Room No. \

Fax Tel. No. 202-477-0515
Dept/Div No. 224/20
Tel. No. \

SUBJECT: Environmental Management of Lake Victoria

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1. Attached is a letter addressed to Mr. Mkanga, Principal Secretary Environment, with a copy of the Aide-memoire of the World Bank/UNEP/FAO mission that visited Tanzania, Uganda and Kenya in March this year.
2. The letter proposes a meeting of the three Governments in Nairobi June 21-23 (UNDP Nairobi has agreed to host) with the objectives for the Governments to: (a) agree on a collaborative mechanism for preparing an environmental management program for Lake Victoria, and (b) take the necessary steps to jointly ask donors (incl. GEF) for preparatory funding assistance.
3. The proposed meeting would be the first test of the commitments of the Governments to moving this initiative forward. Two consecutive Bank missions have paved the way so far. It is now up to the three Governments to take the next steps. As you realize we need to make a sincere effort to bringing delegations from the three countries together on the proposed dates. Hence, UNDP has graciously agreed to foot the bill for travel and accommodation for the Government delegations.
4. We therefore ask for your kind assistance in (a) ensuring that the letter with the attached Aide-Memoire reaches Mr. Mkanga with minimum delay to allow maximum time for Government to review of the attached documentation, (b) impressing on Mr. Mkanga through direct personal communication the significance of this meeting and the need for an early reaction to the proposal for the June 21-23 meeting. In brief, we need to have a response whether the Tanzanians are prepared to participate in the meeting and who the participants are likely to be. May we also ask the help of your office in distributing as soon as possible copies of the attached letter to addressees as marked on the attached page.
5. Would be grateful if you could treat this as a matter of high priority and urgency.

cc. Southworth, Sharma

Transmission authorized by: Sushma Ganguly

Sushma Ganguly

9

Resident Mission in Dar-es-Salaam to pls arrange for urgent distribution of copies of letter and attachments to the following marked addressees:

- * Principal Secretary, Ministry of Finance
- * Principal Secretary, Planning Commission
- * Principal Secretary, Ministry of Agriculture
- * Principal Secretary, Ministry of Water, Energy and Minerals
- * Director General, National Environmental Management Council
- * Director of Fisheries, Ministry of Tourism, Natural Resources and Environment

UNDP GEF Coordinator New York

- * UNDP Resident Representative Dar-es-Salaam
- UNDP Resident Representative Nairobi
- UNEP Chief GEF Unit, Nairobi
- FAO GEF Coordinator and Chief Inland Fisheries Service, Rome
- * FAO Representative, Dar-es-Salaam
- * Royal Netherlands Embassy, Dar-es-Salaam
- * EC Delegate, Dar-es-Salaam
- * USAID Representative, Dar-es-Salaam
- * SIDA, Dar-es-Salaam
- * World Bank Resident Representative, Dar-es-Salaam

THE WORLD BANK/IFC/MIGA
OFFICE MEMORANDUM

DATE: December 15, 1992

TO: Mr. Francis X. Colaço, Director, AF2

THROUGH: Ms. Vijaya Mackrandilal, Acting Division Chief, AF2AE

FROM: L. Videmus, Pr. Economist, AF2AE

REFERENCE: 34188

SUBJECT: Regional Management of Lake Victoria Basin
Reconnaissance Mission
Back-to-Office Report

1. As per terms of reference dated October 19, 1992 I visited Uganda, Tanzania and Uganda October 21 to November 7, 1992. I was joined on this mission by Mr. Gerhart Schneider, Program Officer, UNEP.

2. Given the exploratory nature of the mission, no Aide-Memoire was left in the field. However, upon return to office on November 20, I finalized together with my colleague a discussion paper entitled "Regional Program for Environmental Management of Lake Victoria" (Attachment 1). The paper summarizes mission findings and conclusions. More importantly, it puts forward for review and discussion an outline of a four-year regional integrated program for management of the lake basin. The paper does not claim to have definite answers to complex and difficult questions. It is a "think piece" designed to provoke discussion and a move toward action. Hence, I propose to circulate this paper to key senior Government officials, representatives of Government technical agencies, scientists and donors.^{1/}

3. The purpose of this memorandum is to propose answers to the following questions: What is happening to Lake Victoria? What needs to be done? How can the Bank assist? What should be the approach? And where do we start?

What is Happening to Lake Victoria?

4. Lake Victoria as an ecosystem has undergone significant and dramatic changes in recent times. Intensive fishing, the introduction of exotic species (Nile perch and tilapia), land use practices (in particular deforestation), and pollution have all contributed to depletion of oxygen in the lake, deteriorating water quality, and the mass extinction of indigenous fishes. This has led some observers to let out calls that the lake is "dying". Others claim

^{1/} Annex 1 of the attached Discussion Paper contains a list of senior Government officials, staff at Government technical department and agencies, scientists in and outside the region, and representatives from donor and UN technical agencies with whom the mission met.

Annex 1

Agencies Contacted and Persons Met
by
Joint World Bank/UNEP Mission (October-November 1992)

I Uganda

- 1) At Ministry for Agriculture, Animal Industry and Fisheries, Entebbe:
Mrs. V. Sekitoleko, Minister for Agriculture, Animal Industry and Fisheries.
- 2) At Ministry of Finance and Economic Planning, Kampala: Mr. E. Tumusiime-Mutebile,
Permanent Secretary
- 3) At Ministry of Environment, Kampala: Mrs. Ocaya-Lakidi, Permanent Secretary for
Environment.
- 4) At National Environment Action Plan Secretariat, Kampala:
Mr. H. Aryamanya-Mugisha, NEAP Co-ordinator; Mr. T. Twongo, Researcher;
- 5) At Department of Fisheries, Entebbe: Mr. E. Kanyike, Commissioner for Fisheries; Dr.
F.L. Orach-Meza, Deputy Commissioner for Fisheries; Mr. C. Dhatemwa, Assistant
Commissioner for Fisheries.
- 6) At HYDROMET project headquarters, Entebbe: Mr. M. Tawfik, Project Director, and
staff.
- 7) At Water Development Department, Kampala: Mr. P. Kahangire, Deputy Commissioner
for Water Development; Mr. J. Karundu, Officer for Rural Water Supply; Mr. Nsubuga-
Senfuma, Senior Chemical Analyst;
Mr. J. Odul, Assistant Commissioner for Water Resources.
- 8) At Ministry of Labour & Social Welfare, Kampala: Commissioner for Occupational
Health; Mr. J. Otim-Ogwal, Deputy Commissioner of the Factory Inspectorate.
- 9) At Uganda Freshwater Fisheries Research Organisation, Jinja: Messrs. D. Ocenodongo,
Deputy Director, J. Obbo Okaronon, Assistant Director of Research, C. Odongkawa,
Fisheries Economist, R. Ogutu-Ohwayo, Fishery Biologist, P. Basasibwaki, Fishery
Biologist.
- 10) At University of Makerere Department of Zoology: Mr. P. Kasoma, Head of the
Department; Institute of Environment: Mr. E. Kateyo, Scientist.
- 11) At UNDP Resident Mission: Mr. Tadlai-Teshome, Resident Representative
- 12) At EEC Res. Rep. Office: Mr. P. Mikos, Rural Development Adviser.
- 13) At Danish Embassy: Messrs. A. Qvartrup and B. Fredriksson
- 14) At FAO Res. Rep. office, Kampala: Mr. A. Khalil, FAO Res. Rep.;

Annex II

List of Documents Received by Mission

I Project Proposals

- 1) Lake Victoria Aquatic Resources Research Project (Phase II of an EEC project being completed), (UFFRO).
- 2) Proposed Lake Victoria Fisheries Commission; a Review of Historical Trends and Guidelines for the Future (by Mr. Sichone, former Commissioner of Fisheries, Tanzania).
- 3) Nabugabo Cichlid Conservation Project (UFFRO).
- 4) Water Resources Management Policy and Institutions in the Lake Victoria Region (FAO).
- 5) A Proposed Study of Euhydrophytes and Associated Phytophilous Macroinvertebrates in the Nymphaea Swamps of Kisubi Bay, Lake Victoria (University of Makerere).
- 6) Project Proposal for a Biological Control Programme for Water Hyacinth in Africa (International Institute of Biological Control).
- 7) Water Hyacinth Control in Lake Kyoga and Lake Victoria (UNDP/FAO?).
- 8) Project Profiles: Lake Victoria Fisheries Research and Management (this is a collection of 9 project proposals which were discussed and endorsed by senior fisheries officials of the three riparian countries during a recent meeting in Dar es Salaam).
- 9) Draft Convention on the Establishment of the Lake Victoria Fisheries Commission (revision 2, 22.10.92 PM) (FAO)

II Reports

- 1) Lake Victoria Fisheries Research Vessel, Review and Proposals (MacAlister, Elliott & Partners).
- 2) Draft National Environment Action Plan for Uganda:
 - a) Topic Paper on Water Resources, Wetlands, Aquatic Biodiversity and Irrigated Agriculture;
 - b) Issues Paper on Wetlands, Water Resources, Fisheries, Aquatic Biodiversity and Irrigated Agriculture;
 - c) Environment Issues Pertaining to Mining, Industry, Toxic Chemicals and Hazardous Materials.
- 3) Project fact sheet of EEC project "Lake Victoria Aquatic Resources Research Project", Phase I).



Environment
Canada

Environment
Canada

Conservation and
Protection

Conservation et
Protection



TO: Mr. Lars Vidæus
Principal Economist
Agriculture and Environment Operations
East Africa Department
World Bank
Washington

Route 1 - 1000

Route 1 - 1000

578
12/28

FAX: 202 477-0515

FROM: E.D. Ongley
National Water Research Institute
Canada Centre for Inland Waters
Environment Canada
P.O. Box 5050
Burlington, Ontario L7R 4A6
Canada

DATE: December 24, 1992

SUBJECT: REGIONAL PROGRAM FOR ENVIRONMENTAL MANAGEMENT OF LAKE VICTORIA - STAP Review

In response to your telephone call of Dec. 22, I am pleased to be able to provide this review of the above document. As I must turn this around within 36 hours, my comments will be quite brief. As you probably know, I provided comments on an earlier GEF proposal, "Integrated Management of the Lake Victoria Basin", on August 20 directly to UNEP.

OVERVIEW


I find this document to be an excellent working document. It is factually correct (within my area of competence -- except that Lake Victoria is the second largest lake [para.3] only in regards to surface area; it rates much further down the list in terms of volume), well focused, logically organized, easy to read, balanced in respect both of scientific and institutional issues, and pragmatic in terms of implementation. The document appears to be written by individuals who, collectively, have successfully integrated environmental and economic perspectives. I find no major flaws of omission or commission with the exception that I do question the details of the implementation recommendations in Section F. By focusing on process mechanisms, the

Canada

recycled paper



RECYCLE



**New
England
Aquarium**

CENTRAL WHARF
BOSTON, MASSACHUSETTS 02146-1773
TEL: 273-5200

MEMORANDUM

DATE: December 24, 1992

TO: Mr. Lars Vidaeus
The World Bank
Washington, D.C. 20433

FROM: Dr. Les Kaufman *LK*
Chief Scientist
New England Aquarium
Central Wharf, Boston MA 02146

RE: Regional Programme for Environmental Management
of Lake Victoria

Here are a few general comments on the draft Regional Programme for Environmental Management of Lake Victoria, which I was honored to have had the opportunity to examine. I speak on behalf of the delegates to the Jinja workshop on People, Biodiversity, Fisheries, and the Future of Lake Victoria, and on behalf of the New England Aquarium, which since 1989 has been a participant in, and coordinator of collaborative, international research and conservation efforts on Lake Victoria. It is excellent that you have had the opportunity to visit and speak directly with many of our colleagues in East Africa, allowing us to base this discussion from their perspective, as much as possible.

The draft is an excellent piece of work. The four-part structure of the proposed program- i.e., fisheries, environmental quality, riparian habitats, and land use, is insightful and sound. The essential elements are there.

Several very important themes in the proposal might well be heightened or clarified. These are: (1) present resources (short-term management of fisheries, forestry and water quality); (2) future resources (conservation of biodiversity and ecological restoration); and (3) sustainability (strengthening the lake's ecological resiliency through ecosystem manipulations). The document is presently strong in area 1, weaker in the other two.

May 20, 1993

Mr. P. Mkanga
Principal Secretary
Ministry of Tourism, Natural Resources and Environment
Dar-es-Salaam, Tanzania

Dear Mr. Mkanga:

Re. Lake Victoria Environmental Management Program

A joint World Bank/UNEP/FAO mission comprising Messrs. B. Nekby, G. Schneider, J. Kapetzky and D. Greboval visited Tanzania, Kenya and Uganda in March to hold discussions with Government officials on the subject of preparation of a regional program for environmental management of Lake Victoria. The mission followed up on the earlier deliberations that a World Bank/UNEP mission last November held with Government representatives, resource managers, scientists and the donor community.

We would like to thank you for the cooperation and assistance you and representatives of your Government extended to the mission. In particular, we are pleased to note from the mission's Aide-Memoire (attached) that there now seems to be a strong consensus emerging on the objectives and scope of an environmental management program for Lake Victoria. On the basis of such a consensus, the next step would be for the three Governments of Tanzania, Kenya and Uganda to launch a collaborative effort to prepare a management program.

The mission held extensive discussions with representatives of all three Governments on this matter. It has prepared an outline of substantive points to be covered under an agreement between the three Governments to jointly prepare an environmental management program for Lake Victoria (Annex II of the Aide-Memoire). This outline with its attachments covers objectives, organization, responsibilities, resource requirements and a preparation schedule. While the outline remains under review, we believe that it is sufficiently comprehensive to merit detailed considerations by the three Governments as a modus operandi for proceeding with the planning of program preparation. A draft agreement addressing the substantive points outlined in Annex II of the Aide-Memoire is being prepared and will be sent to you for your consideration shortly.

It is proposed that a Regional Policy and Steering Committee, assisted by a small regional secretariat, guide the preparation by Regional Task Forces of program proposals in two main areas: fisheries management and water hyacinth control, and management of water quality and land use (including wetlands). These Regional Task Forces would have broad representation from the public and private sectors, including representation from the scientific community and non-governmental organizations. They would be supported by local and international consultants. Their work would be based on proposals presented by National Working Groups coordinated by National Secretariats (linked to the NEAP or NCS secretariats currently in place).

Two consecutive donor missions have now engaged in detailed discussions with representatives of each of the three respective Governments. The response and enthusiasm shown by the three

May 20, 1993

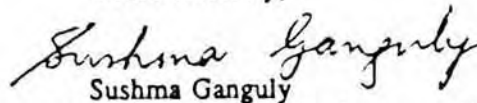
Governments have been encouraging. To build on this momentum and to initiate a process of collaboration, it is now essential that the focal points in each of the three Governments meet to discuss the next steps, namely first adopting a collaborative mechanism for preparing a regional program and, second, jointly requesting donor assistance for the preparation of the program. We would propose that Annex II of the enclosed Aide-Memoire may serve as a starting point for such discussions, once it has been given the necessary review and consideration at the national level.

The Resident Representative of UNDP in Nairobi has kindly offered to host such a meeting in Nairobi and is prepared to extend the necessary travel and accommodation facilities for delegations from the three countries to attend the meeting. The proposed dates for this meeting are June 21 to 23, 1993. The first two days could be devoted to discussions between the three Government delegations. If convenient to the Government delegations, the third day could be used for meeting with the donor community to discuss next joint steps in getting a collaborative preparatory effort underway.

We look forward to receiving your early views and reactions to the proposal for a joint meeting by the three Governments, and have requested our Resident Representative in Dar-Es-Salaam to stay in touch with you on this matter. As you will appreciate the proposed meeting will only materialize if all three Governments find it convenient to meet at an agreed venue at an agreed date. To facilitate a process leading to such an agreement and the timely preparations for the meeting, we would ask for your early consideration and communication on the proposed initiative. Please be advised that we have sent letters, with copies of the attached documentation, proposing the joint meeting of the three Governments in Nairobi on June 21-23 to Mr. Michael G. Okeyo, Permanent Secretary, Ministry of Environment and Natural Resources, Kenya and Mr. Emmanuel Tumusiime-Mutebile, Permanent Secretary, Ministry of Finance and Economic Planning, Uganda.

Finally, let me assure you that we stand ready, together with the donor community at large, to assist you and your colleagues from Kenya and Uganda to bring this exciting initiative to fruition. We shall be prepared to assist in any possible way to make the discussions at the proposed June meeting in Nairobi as productive as possible.

Yours sincerely,



Sushma Ganguly

Division Chief, Agriculture and Environment Operations
East Africa Country Department

Attachment

cc: Principal Secretary, Ministry of Finance
Principal Secretary, Planning Commission
Principal Secretary, Ministry of Agriculture
Principal Secretary, Ministry of Water, Energy and Minerals
Director General, National Environmental Management Council
Director of Fisheries, Ministry of Tourism, Natural Resources and Environment

May 20, 1993

- UNDP GEF Coordinator New York
- UNDP Resident Representative Dar-es-Salaam
- UNDP Resident Representative Nairobi
- UNEP Chief GEF Unit, Nairobi
- FAO GEF Coordinator and Chief Inland Fisheries Service, Rome
- FAO Representative, Dar-es-Salaam
- Royal Netherlands Embassy, Dar-es-Salaam
- EC Delegate, Dar-es-Salaam
- USAID Representative, Dar-es-Salaam
- SIDA, Dar-es-Salaam
- World Bank Resident Representative, Dar-es-Salaam

LAKE VICTORIA ENVIRONMENTAL MANAGEMENT PROGRAM

Aide-Memoire

World Bank/UNEP/FAO Mission, March 1993

1. During the World Bank annual meeting in Washington in 1992 the Finance Ministers of the Governments of Kenya, Tanzania and Uganda suggested that attention be given to the environmental problems of Lake Victoria. Being an international water body and subject of a long standing interest and involvement by UNEP, Lake Victoria and a regional program for its environmental management would merit consideration for the Global Environment Facility (GEF). A World Bank/UNEP reconnaissance mission in October/November 1992 interacted with Government agencies and NGOs in the three countries as well as with donors in an attempt to define the problems and explore possible solutions. The findings of the mission were summarized in a discussion paper entitled "Regional Program for Environmental Management of Lake Victoria," dated November 1992.

2. A follow-up mission consisting of Messrs G. Schneider (UNEP), J. Kapetsky (FAO, part-time), D. Greboval (FAO, IFIP, part-time) and B. Nekby (World Bank, consultant) visited Kenya March 1 to 4 and 18 to 19, Uganda March 4 to 11, and Tanzania March 11 to 17, 1993. The objectives have been twofold: first, to solicit the reactions in the three countries to the discussion paper outlining the major problems and program components to address these problems; and second, to discuss the mounting of a regional effort to prepare for international funding and to implement a regional program in relation to the environmental problems of Lake Victoria. The latter discussion was based on an early draft of a proposed collaboration agreement between the three countries. A list of agencies contacted is presented in Annex I.

3. Both in the Government discussions and in reviews within the donor community the interest in a Lake Victoria Environmental Management Program was much in evidence. The issues raised during these intense and wide-ranging discussions are summarized below. They include issues related to the content of the program, the organization of program preparation, and processing and funding. Attached is an outline of Substantive Points for a Collaboration Agreement for consideration of the three countries, which reflects the recommendations of the follow-up mission on the content and the organization of the envisaged preparation effort (Annex II).

Issues Related to the Content of the Program

4. The mission found considerable support for the problem definition in the discussion paper (summarized in the first section of Annex II). Rapid population growth in the area was indicated as a basic factor behind the increasing pollution in Lake Victoria. The need to analyze fisheries production over time with and without measures to counter the environmental problems was also emphasized. The present level of knowledge does not allow firm projections, but there is considerable risk that fisheries production will collapse if stocks are too heavily exploited and oxygen concentrations in the lake continue to decrease.

5. The program components proposed in the discussion paper, i.e. fisheries management, management of pollution and water quality, management of wetlands and water hyacinth control, and management of land use in the catchment were unanimously endorsed. It may be possible to

group these four components in two broad areas, one focussing on the lake and the other on the catchment. The lake component would concern fisheries and water hyacinth control, while the catchment component would deal with water quality and the impacts of industrial, municipal and agricultural pollution, and land use in the catchment, including wetlands management. ^{1/} Due to the enormous size of the catchment (18 million ha) it is essential to narrow the task by pinpointing and prioritizing critical sources of pollution. The balance between further studies and research and early action was the subject of much discussion. In the discussion paper such a balance was advocated by suggesting strengthening fisheries extension, monitoring and enforcement, and control measures in the case of water hyacinth. It is clear that the three Governments would like to see more investments, particularly in relation to critical sources of pollution.

6. The complexities of a multisectoral and multinational program to address the environmental problems of Lake Victoria are immense. It is of paramount importance, at least initially, to focus the attention on a few key components. Suggestions to broaden the scope of the program must be weighed against that necessity. A component to deal with the health problems around the lake, including AIDS, was frequently proposed in the discussions. However, the need to tackle these problems on a regional basis is not very apparent, except possibly in the case of water-borne diseases. If the proposal merely implies raising the awareness level through messages included in extension or other contacts with the local population under one of the components, this may well be possible. But if it implies a separate health component with a full scale involvement of the countries' health administrations in the regional collaboration, the prospects for effective implementation could be jeopardized. A sanitation component in relation to different sizes of communities has both a health and pollution dimension and would seem to merit some further consideration.

7. Another issue mentioned was that transport across Lake Victoria, particularly of petroleum, imposes some obvious hazards. However, apart from reviewing safety regulations and their enforcement there seems to be little scope for intervention.

8. The dramatic decline in biodiversity associated with the introduction of exotic fish species was one of the major problems highlighted in the discussion paper. During the review it was noted that the discussion paper is relatively silent on remedial action. Some of the smaller lakes adjacent to Lake Victoria could be utilized to preserve biodiversity. Aquaculture may play a role in reintroducing endangered species in Lake Victoria in connection with improved fisheries management.

9. **Recommendations.** Apart from the four components outlined in the discussion paper, attention during program preparation should be given to:

- analyzing scenarios for fisheries production with and without remedial action;
- exploring the scope for early investment to deal with critical sources of pollution;
- raising awareness around the lake about AIDS and water-borne diseases;

^{1/} While water quality control would be primarily a matter for the second component in as much as the sources of water quality problems are concerned, the first component would need to address the question of effects of water quality on living organisms and the monitoring of such effects.

- reviewing existing conditions and formulating proposals to improve sanitary conditions;
- reviewing safety standards for transport across the lake and their enforcement; and
- formulating proposals to counter the loss of biodiversity, including the use of adjacent lakes as biodiversity reserves and eventually the reestablishment of endangered species as one of the management activities.

Issues Related to the Organization of Program Preparation

10. It was agreed that the organizational arrangements for program preparation should be such that, with slight modification, they would also be applicable to the implementation phase. Using the two-pronged approach with a lake and a catchment component (as advocated in para. 5), one would need groups both at the national and the regional level which focus on the lake component (fisheries management and water hyacinth control) and the catchment component (management of water quality and land use, including wetlands). Such national and regional groups would need to be guided on policy matters and overall program orientation by a regional policy and steering committee, assisted by a small regional secretariat. The chart in Annex II, Attachment 6 shows possible organizational arrangements. Terms of Reference for the proposed organizational entities are presented in Annex II, Attachment 2.

11. **National Working Groups.** At the national level each country would set up two working groups dealing with the lake and the catchment component, respectively. The members of these National Working Groups would need to be drawn from different parts of the administration, from the scientific community, and from representatives of local interests. They would propose a national action program, prepare the ground for the regional deliberations, and guide program execution at a later stage. A National Secretariat (possibly forming part of the NEAP/NEMC secretariat) for the Lake Victoria program would be required in each country to provide logistical support to the two national working groups, to coordinate their work and prepare a national position in relation to the agenda of the Regional Policy and Steering Committee (para. 14).

12. **Regional Task Forces.** Two Regional Task Forces, one on Fisheries Management and Water Hyacinth Control (Regional Task Force 1) and one on Management of Water Quality and Land Use, including Wetlands (Regional Task Force 2), would be established to prepare program proposals based on the output of the National Working Groups. The proposed Regional Task Force for Fisheries Management and Water Hyacinth Control would be replaced by the Fisheries Commission for Lake Victoria, once the latter has established with its two committees, the Management Committee and the Scientific Committee.

13. Research on the environmental problems is well underway under miscellaneous auspices and would be intensified under the program. A priority for research is to determine the present status of the fishery resources and the sustainability of the fisheries. Studies for this purpose would embrace stock assessment, fisheries biology, limnology, biodiversity conservation and fish population genetics, as well as the socio-economic impact of various policy options. During program preparation these would be more sharply defined and integrated in order to focus and supplement ongoing efforts. In the case of pollution, research to identify critical sources, to understand the lake's capacity to absorb and biodegrade waste, and to map its circulatory system and how pollutants are transported from one part of the lake to others would be promoted. The

filtering effects of the wetlands would need to be better understood, and research/testing of ways and means to ameliorate the negative effects of changes in wetland use undertaken. The question arose during the mission whether the Scientific Committee could be broadened to include also the pollution aspects noted above. If so, the Scientific Committee could attempt to focus the research effort on key problems and to channel funds to appropriate institutions in the three countries. It could then over time try to build a central data base for information on the lake and at regular intervals summarize such information in a publication on the state of Lake Victoria.

14. **Regional Coordination and Collaboration.** The preparation and implementation of the Lake Victoria Environmental Management Program would be guided by a Regional Policy and Steering Committee. Each country would need to determine its representation. On the basis of the discussions held, a delegation of maximum three members headed by a person at permanent secretary level may be suggested. An appointed chairman, such as a part-time senior (retired) civil servant acceptable to all three countries, would lead the deliberations and promote the recommendations.

15. A small Regional Secretariat would serve as the executive arm for the Regional Policy and Steering Committee. It would be headed by a full-time Executive Officer who would be responsible for guiding and monitoring program preparation according to a schedule approved by the Regional Policy and Steering Committee. Together with the heads of the three National Secretariats, the Executive Officer would be responsible for the preparation of the draft final program report to be considered by the Governments and subsequently by donors.

16. A variation on the above arrangement has been suggested to the mission by Uganda. It would involve setting up the framework for regional collaboration on Lake Victoria under the auspices of the East African Development Bank (EADB) which is the only remaining organization for collaboration in the region. Such an arrangement could involve linking the Regional Secretariat to EADB's central regional office and the National Secretariats to EADB's offices in the three countries.^{2/}

17. The commitment to regional collaboration will to a large extent determine the prospects for the Lake Victoria Environmental Management Program. Past experience has often been discouraging. There is reportedly some ongoing deliberations on the revival of parts of the East African Community efforts. With respect to Lake Victoria the signing of the Collaboration Agreement, the establishment of the Fisheries Commission, and the resolution of the TECCONILE difficulties would provide early indications of the scope for a regional program.^{3/}

^{2/} With EADB being a legal entity with offices in all three capitals, it may be well positioned to handle the logistics of regional collaboration in preparing an environmental management program for Lake Victoria based on external funding support.

^{3/} The Fisheries Commission would be constituted as envisaged in the draft Convention for the Lake Victoria Fisheries Commission. The finalization of the Convention is reported to be well advanced in the three countries. A firm decision should precede the launching of program preparation and provide concrete evidence of the willingness of the three countries for regional collaboration. Suggestions to broaden the scope of the Fisheries Commission to a Lake Victoria Commission may be premature, but could be considered once the scope for regional efforts has been demonstrated more clearly. Regional collaboration with a bearing on Lake Victoria is currently facing adversities in respect to TECCONILE (previously HYDROMET) which, among other tasks, plays an important role in monitoring water quality. Kenya is presently considering whether to continue her participation in TECCONILE. It is beyond the scope of this mission to pass any judgement about the difficulties.

The formulation of a joint action program and the handling of a few selected policy issues preparation would provide further evidence. The subsequent requests for appraisal and the negotiation of an operation in support of the funding of a Lake Victoria Environmental Management Program would give additional opportunity to gauge the determination and the prospects for success. (2)

18. The Kagera river is reported to be a major source of silt, nutrients, and water hyacinth infestation in Lake Victoria. Its catchment involves—apart from Tanzania and Uganda—also Rwanda, Burundi, and Zaire. The Kagera Basin Organization formed by these countries is presently not very active. One would need to explore whether the Kagera Basin Organization could be supported to play a role in addressing some of the problems emanating in the Kagera basin.

19. Recommendations. Summarizing, the following is recommended:

- The organization of the preparation effort would be based on the arrangements outlined in the attached chart (Annex II, Attachment 6). The three Governments would sign a collaboration agreement. The composition of the Policy and Steering Committee would be as described in para. 14.
- The Scientific Committee under the Fisheries Commission would be broadened to guide and support research on all aspects of environmental management, to provide a data bank, and to prepare in due course regular reports on the state of Lake Victoria.
- Decision on the Lake Victoria Fisheries Commission and resolution of the TECCONILE conflict would precede launching of preparation efforts. Some selected policy issues would be addressed during program preparation.
- The Kagera Basin Organization would be contacted to explore suitable forms for collaboration.

Issues Related to Processing and Funding

20. Follow-up Meeting. The two rounds of discussions, which have been held between the World Bank/UNEP/FAO identification missions and the Governments, donor agencies and some NGOs in each of the three countries, must now be followed by a joint meeting of the Governments to finalize the Collaboration Agreement for the preparation of a Lake Victoria Environmental Management Program. The meeting should be convened as soon as the Governments have had the time required to consider the recommendations of this Aide-Memoire and the attached Annex II. It should be a three-day meeting with the first day being devoted to interaction between the Government representatives and the World Bank/UNEP/FAO mission to discuss and clarify some of the recommendations presented in the Aide-Memoire. The second day could be devoted to negotiations between the Government representatives to derive a mutually agreeable framework for program preparation. This may include a review of the position on the establishment of the Fisheries Commission and the resolution of the TECCONILE difficulties.

but a solution must be found as part of the broader collaboration agreement for Lake Victoria.

The third day may be devoted to a presentation by the representatives of the three Governments to interested donors of the program for the preparatory phase and the required support.

21. **Preparatory Funding.** After signing a collaboration agreement, each Government would nominate its participants in the National Working Groups, Regional Task Forces and the Regional Policy and Steering Committee, and request funding from the Global Environment Fund (GEF) and other donors to support program preparation. Possible GEF funding of the preparatory phase could come in the form of a Project Preparation Advance (PPA), managed by the World Bank, or through the UNDP managed Preinvestment Facility (PRIF). The choice of facility, to be made by the Governments together with GEF institutions, would be influenced by the nature of the final collaboration agreement and the ease and speed of processing requests for funding support.

22. If the PPA facility is used, there would be one PPA for each of the three countries. Each PPA would cover the work of the two National Working Groups, the National Secretariats, and one of three regional functions (two Regional Task Forces and the Regional Secretariat) for which an individual country would have the lead function. The lead function would only imply that the country in question would chair the meetings and request external assistance for the operations of the entity. (Under the option of using EADB as framework for regional collaboration in preparing the program, there would be four PPAs, one for each of the three countries to cover National Working Groups and the National Secretariats, and one for EADB for regional collaboration).

23. **Tentative Preparation Schedule.** Assuming that the Governments can finalize and sign a collaboration agreement by early July 1993, followed by a request for funding assistance to GEF/other donors later in the month, it should be possible for the preparation work to start in October 1993. It is expected that the work of national working groups, regional task forces, assisted by consultants and guided by the regional coordination mechanisms proposed, could lead to the completion of a comprehensive report on a proposed environmental management program by mid 1994.

24. The key actions and their preliminary timing would be as follows:

- 1. Execute a collaboration agreement 7/93
- 2. Request GEF/donor preparatory funding 7/93
- 3. Appoint members to Working Groups, Task Forces, Secretariats, etc. 8/93
- 4. Complete preparations for tendering of consultant services and other procurement 9/93
- 5. Appointment of consultants 10/93
- 6. Procurement of equipment 10/93
- 7. National Working Groups meeting 10/93-2/94
- 8. Regional Task Forces meeting 10/93-3/94
- 9. Completion first draft of Preparation Report 05/94
- 9. Policy Steering Committee meetings
 - Inception Meeting 10/93
 - Mid-Term Review 01/94
 - Final Review 05/94
- 10. Review by Governments 06/94
- 11. Request by Governments to donors for appraisal 07/94

12. Regional Seminar

08/94

The above schedule should, however, not preclude projects or programs that are already underway or in advanced stages of consideration from going ahead.

25. Donor Coordination and Support. The GEF can be expected to fund a substantial part (say 60 percent) of the preparation costs which have tentatively been estimated to be about US\$ 2.0 million, and a smaller part of the implementation cost. It is thus of vital importance to involve other interested donor agencies from the start.

26. From discussions in the field it appears that the Netherlands, USAID, and DANIDA (monitoring water quality) have a definite interest, while the interest of other bilateral donor agencies such NORAD, SIDA (soil and moisture conservation in Kenya), and ODA may be further explored. The EC is about to appraise a second phase of a crucial regional fisheries research project on Lake Victoria. FAO is executing a regional biodiversity project and is set to embark on regional TCP projects to support water hyacinth control and the establishment of the Fisheries Commission. The successful UNDP financed and FAO executed regional Inland Fisheries Project is about to close due to lack of funds within UNDP for regional undertakings. UNEP is closely affiliated with the TECCONILE endeavor. A number of organizations including IDRC are supporting research around Lake Victoria. Research institutions, particularly in Uganda, presently receive support under a number of IDA projects. IUCN with finance from various bilateral donors is promoting national policies in relation to wetlands. This work is far advanced in the case of Uganda and is at an initial stage in Kenya and Tanzania.

27. To achieve a comprehensive effort in addressing the environmental problems of Lake Victoria, it will be necessary to integrate and coordinate this external assistance. There is a need for a partnership among donors in support of an agreement between the three countries to prepare an environmental management program. Membership in such a partnership should reflect a willingness to work within the framework set by a collaboration agreement, to support the preparation effort (or ongoing key project activities), and to participate in the review meetings during preparation and in the subsequent appraisal with the ultimate aim of contributing to the funding of implementation if an acceptable basis for such support emerges.

28. With this in mind, the two identification missions have attempted to consult with the donor community on the content and organization of the preparation effort. However, it is essential to ensure among interested donors that the plans reflected in the draft Collaboration Agreement represent an acceptable basis on which to proceed. A memorandum of understanding or intent signed by interested donors linked to a collaboration agreement between the Governments may be one way of formalizing the partnership. During the proposed follow-up meeting (para. 20) it would be necessary to find a suitable form for the partnership and to finalize contributions to the preparation process. With respect to a possible GEF grant, one should also discuss the provision of consultancies and other support for the preparation through one or more contracts with suitable agencies or consultancy firms.

29. Recommendations. In summary, the following is recommended:

- A three-day meeting, involving "focal points" from the three Governments, should be convened as soon as possible to finalize an agreement of collaboration and to discuss donor support.

- The program should be processed in accordance with the schedule presented in para. 24.
- For success of the program some form of partnership among donors in support of collaboration between the three Governments will be necessary.

Annexes

- I List of Agencies Contacted
- II Substantive Points for a Collaboration Agreement (with Attachments)

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List of Agencies Contacted

Kenya

Ministry of Environment and Natural Resources
Kenya Marine Fisheries Research Institute
Hydromet/TECCONILE
British High Commission
Danida
EC
FAO
German Embassy
IDRC
IUCN
Netherlands Embassy
OECF, Japan
SIDA (RSCU)
UNDP
UNFPA
UNDP
UNEP
USAID
Winrock International
World Bank Resident Mission

Tanzania

Ministry of Tourism, Natural Resources and Environment
Ministry of Water, Energy and Minerals
Ministry of Agriculture
National Environment Management Council
Tanzania Fisheries Research Institute
CIDA
EC
FAO
Netherlands Embassy
SIDA
UNDP
World Bank Resident Mission

Uganda

Ministry of Finance and Economic Planning
Ministry of Agriculture, Animal Industries and Fisheries (Fisheries Department)

Ministry of Energy, Water and Environment
National Environment Action Plan Secretariat
Bank of Uganda (Agricultural Secretariat)
Uganda Freshwater Fisheries Research Organization
East African Development Bank
EC
Danida
FAO
IUCN
UNDP
USAID
World Bank Resident Mission

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LAKE VICTORIA ENVIRONMENTAL MANAGEMENT PROGRAM

Substantive Points for a Collaboration Agreement

1. Statement of Problem

1.1 The present level of exploitation of the fisheries resources of Lake Victoria, fueled by increased local and export demand, is likely to exceed the sustainable yield of the lake fishery.

1.2 The introduction of exotic species has resulted in a substantial increase of production but also in a dramatic decline in the diversity of fish species. A large number of original species are now extinct or facing depletion which in turn has contributed to increased prevalence of algae and to oxygen depletion at deeper levels of the lake, thereby posing a threat to the Nile Perch itself and to other living resources.

1.3 Discharge of sewage and industrial waste adversely affects fisheries and sanitary conditions. In particular,

- (a) intensified farming and depletion of vegetative coverage have caused siltation and leakage of nutrients into the lake, thus further contributing to eutrophication; and
- (b) wetlands which served as filters have increasingly come under cultivation.

2. Objectives of Collaboration

2.1 With the aim of ensuring sustainable production from Lake Victoria, providing safe water and preserving biodiversity and the natural heritage, the Governments of Kenya, Tanzania and Uganda hereby agree to embark on a process to build and implement over time effective mechanisms for regional collaboration in the environmental management of Lake Victoria. Such mechanisms would aim at joint management of common resources (including consideration of tradeoffs between production and conservation objectives), resolution of transboundary conflicts, effective monitoring of key parameters in all parts of the lake, harmonization of legislation and policy, research collaboration, and the identification of regional investment priorities.

2.2 The environmental management will require a sustained longterm effort. As a first phase the Governments agree to embark upon the preparation of a five-year program to strengthen regional coordination in management of fisheries, lake pollution and water quality, water hyacinth control, wetlands, and land use in the lake catchment. The action program is expected to provide a framework for donor support. The components of the proposed five year program and the focus of the preparation efforts are elaborated in Attachment I.

3. Organization of the Preparation Effort

3.1 Having decided to establish the Fisheries Commission the Governments now agree to set up institutional mechanisms for broader regional collaboration in the preparation of a Lake Victoria Environmental Management Program. These mechanisms, shown in the chart in

Attachment 6, consist at the regional level of a Regional Policy and Steering Committee, assisted by a small Regional Secretariat, and two Regional Task Forces.

3.2 The Regional Policy Steering Committee is expected to be led by an appointed part-time chairman, acceptable to all Governments, and to include a maximum of three representatives of each country headed by an officer at permanent secretary level. A full-time Executive Secretary would be responsible for monitoring progress, preparing review meetings and compiling the preparation report.

3.3 The two Regional Task Forces would be concerned with fisheries management and water hyacinth control (Regional Task Force 1), and pollution, wetlands management, water quality control and land use in catchment (Regional Task Force 2) and would consist of selected members from corresponding National Working Groups. Both national working groups and regional task forces would have their membership drawn from the public and private sectors, including representation from the scientific community and non-governmental organizations.

3.4 At the national level, the working groups would include both administrative and scientific staff and a special effort would be made to incorporate local community interests, NGOs and academic institutions. A small secretariat would be provided in each country to lend logistical support, integrate the findings of the working groups and prepare for the regional deliberations. The heads of the national secretariats would assist the Executive Secretary of the Regional Secretariat in preparing for review meetings and compiling the preparation report. The National Secretariat would be linked to the existing institutional arrangements for preparation of National Environmental Action Plans or National Conservation Strategies. The terms of reference of the different organizational entities are outlined in Attachment 2.

4. Responsibilities

4.1 Each Government would assume the responsibility for organizing the national working groups and the national secretariat. In addition, each of the three Governments would assume the lead responsibility for one of the three regional collaborative mechanisms, namely the small regional secretariat serving the Regional Policy and Steering Committee, and the two regional task forces.

4.2 Thus it has been agreed that Kenya will have the lead responsibility for [], Tanzania for [], and Uganda for [].

4.3 Within the framework established by this collaboration agreement each Government would request external assistance for the tasks for which it has been assigned responsibility.

5. Resource Requirements

5.1 A list of and job descriptions for proposed consultants is presented in Attachment 3, and a preliminary estimate of the overall resource requirements for program preparation broken down by responsible country/agency is given in Attachment 4.

6. Preparation Schedule

6.1 A proposed action plan for program preparation is presented in Attachment 5. This would allow preparation to start in October 1993 and a possible request for appraisal to be submitted in July 1994.

Attachments

- 1 Proposed Components and Preparation Tasks
- 2 Terms of Reference for Organizational Entities
- 3 Consultant Requirements for Preparatory Program
- 4 Preliminary Estimate of Resource Requirements
- 5 Action Plan for Program Preparation
- 6 Proposed Organizational Structure for Preparatory Phase

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**Proposed Components and Preparation Tasks
of a Lake Victoria Environmental Management Program**

Component 1: Fisheries Management and Water Hyacinth Control

1. The fisheries management part of this component has received considerable attention and is well advanced. Important milestones were (a) the International Workshop on People, Fisheries, Biodiversity and the Future of Lake Victoria, held in Jinja in August 1992, (b) the Regional Meeting for the Management of Lake Victoria and the Creation of a Lake Victoria Fisheries Commission, held in Dar-es-Salaam October 20-24, 1992, and (c) the preparation of a second phase of a regional aquatic resources research project for EC consideration. Also, many external parties (notably UNDP, FAO, IDRC, various US based entities, IDA and EC) are already giving considerable support for fisheries management, research and development in the region.

2. Taking these developments into consideration and consistent with the recommendations of the Discussion Paper entitled Regional Program for Environmental Management of Lake Victoria, prepared by the World Bank/UNEP reconnaissance mission in November 1992, the following tasks are visualized:

- (a) Setting up of a Regional Task Force for fisheries management as a precursor to the Lake Victoria Fisheries Commission with a Scientific Committee and a Management Committee and supported by National Working Groups in each of the three countries. The Regional Task Force and the National Working Groups would also be responsible for preparation of the water hyacinth control program.
- (b) Establishment of Lake Victoria Fisheries Commission. A FAO TCP project for this purpose is being considered. While awaiting the approval of the TCP, or in the event it is not approved, the preparation will focus on:
 - (i) establishing the work program, operational procedures, staffing and budget requirements;
 - (ii) preparing a fishery management program that addresses important policy issues, including minimum fish sizes for industrial processing and industrial processing plant numbers and capacities; and
 - (iii) identification of an action plan to establish and implement a management program covering but not necessarily limited to policy measures such as minimum gill net mesh sizes, ban on beach seining, control of fish and fish products exports and expansion of fish processing plants, area closures, seasonal closures, and imposition of penalties for violations of regulations. (Supporting policy analysis will need to include the social and economic consequences of various options on fishing communities, processors, transporters and sellers.)

- (c) Improvement of the information base for environmental management. Guided by the Jinja and Dar es Salaam meetings (para. 1), the EC Phase II and other documentation, the preparation will focus on:
- (i) preparing a priority research program for fisheries management embracing stock assessment, fisheries biology, limnology, biodiversity conservation and fish population genetics as well as socio-economic analysis of policy options;
 - (ii) reviewing existing research and identifying a priority research program on pollution including issues such as the sources of pollution, the lake's capacity to absorb and biodegrade waste, the circulatory system and the transport of pollutants from one part of the lake to others, the sustainability of changes in land use and wetland use and the impact of such changes on the lake, and prospects for mitigating the effects of such changes;
 - (iii) assessing the present capabilities of different research institutions and the need for institutional strengthening, outlining the sharing of responsibilities, and reviewing the mechanisms for regional and international cooperation; and
 - (iv) identifying the scope for a central data base for the environmental management of Lake Victoria and for regular reports on the state of the Lake.
- (d) Strengthening extension, monitoring and enforcement capabilities of national fisheries administrations, including possible joint/reciprocal surveillance and enforcement measures. The preparation will focus on:
- (i) analyzing existing arrangements for funding fisheries extension, monitoring and enforcement, analyzing and developing options such as taxing fish and fish products exports, imposing registration fees for fishing vessels, prospects for increased budgetary allocations, and retaining special taxes and fees (including the scope for "Fisheries Development Funds");
 - (ii) based on the funding that can be made available, preparing detailed proposals on how to strengthen extension, monitoring and enforcement capabilities of national fisheries administrations. The preparation will focus on:
 - an evaluation of present capabilities;
 - establishment of criteria for strengthening the services (sustainability-impact on recurrent budget, degree of self-financing), and the balance between enforcement and extension (the main emphasis should probably be on incentives and close involvement and interaction of those concerned);

- definition of the necessary minimum level of monitoring through a fishery statistical program that includes catch data, information about vessels and fishing gears used;
 - a socio-economic information system integrated with other statistical data and information on effectiveness of regulations and resource requirements for that purpose;
 - harmonization of the statistics among the countries;
 - systems and resource requirements for enforcement; and
 - systems and resource requirements for extension including participatory analysis of problems and remedies.
- (e) Controlling water hyacinth. A regional FAO TCP project would provide assistance with this component. The preparation would involve the following tasks:
- (i) establishing a program to monitor the distribution of water hyacinth;
 - (ii) determining the sources of infestation and methods to deal with such sources; in the case of the Kagera river, the scope for cooperation with and support of the Kagera Basin Organization in dealing with such infestation may be explored;
 - (iii) designing pilot projects to test different methods or combination of methods to eradicate water hyacinth;
 - (iv) ensuring the availability of facilities adequate to the need to propagate biological control material; and
 - (v) testing the economic and technical feasibility of different proposals for utilization of water hyacinths.

Component 2: Management of Water Quality and Land Use (including Wetlands)

3. Consistent with the findings of the Discussion Paper, the following tasks are envisaged:
- (a) The establishment of a Regional Task Force for management of water quality (pollution) and land use, including wetlands, supported by National Working Groups in the three countries.
 - (b) Proposal of regional water quality objectives to serve as standards for design and implementation of water quality management and monitoring programs at the appropriate level in each country, including target standards for the release of effluent.

MEMORANDUM

To: Lars Vidaeus
From: Les Kaufman, LVEMP Research Committee
Re: Lake-Victoria Environmental Management Program
Proposed Activities Under "Head Start" Funding
Date: June 13, 1993

I promised to leave you a list of a few items that are urgently needed for interim monitoring of the ecological situation in Lake Victoria. Here they are. I discussed some of these ideas with Mr. Carl Harbo as we agreed, and also with Mr. Richard Fuller (FAO), at the urging of Roy Southworth at the ResRep's office. In addition to colleagues at NMK and KMFRI in Kenya, and TAFIRI in Tanzania, I had lengthy and fruitful discussions of this matter with Dr. Alan Rogers, who runs a GEF project out of FAO Dar, Dr. Geoffrey Howard, of the IUCN, and Dr. Pieter Kat, a wildlife and aquatic biologist who spent nine years with the National Museums of Kenya. Dr. Kat has agreed to play a more central role in preparatory and subsequent phases of our project; originally he was slated to lead the biotic inventory of Lake Victoria molluscs, in which capacity he will continue.

One other note: would it be permissible for Dr. Kat to sit in as an observer at the June 21 meeting? He would be able to fill in for me on most matters anyway.

SLATE OF URGENTLY NEEDED RESEARCH
FOR MANAGEMENT DECISIONMAKING IN LAKE VICTORIA

1. Monitoring of Key Components and Processes in Lake Victoria

A minimum requirement for decisionmaking is a graphic information systems (GIS)-based information resource and the data acquisition mechanisms to feed it. The critical temporal and spatial dynamics in need of tracking are:

- i. Dynamics of vegetation at the land-water fringe, including water hyacinth, papyrus, riparian forest, and if possible, submerged vegetation in the shallows.
- ii. Dynamics of fishing boat and fish landing activities over time, similar to what has been performed for Lake Tanganyika in an FAO fisheries project.
- iii. Dynamics of gross biological and physical processes of the lake, as manifested, for example, by the parameters of temperature, conductivity, oxygen, and chlorophyll, across depth and position in the lake.
- iv. Dynamics of biodiversity refugia in the form of lagoons, satellite lakes and ponds, river mouths, and lake islands.

v. Dynamics of bulk movements of Nile perch, dagaa, tilapia, Caridina, and Chaoborus with respect to the distribution of oxygen and primary productivity in the lake.

The following facilities and systems will be needed to accomplish this task:

1. Satellite remote sensing and image analysis capability.
2. Video (High-8) and video image analysis capability.
3. Aerial reconnaissance capability.
4. Ship and instrument facilities to operate a reduced set of key limnological groundtruth depth transects. We recommend the following long-term monitoring stations:

- A. Bukoba
- B. Mwanza
- C. Shirati
- D. Bugaia
- E. Kenya Station 103 (near Port Victoria)
- F. lake center

5. Transport, collecting gear, and field teams for acquisition of biodiversity and vegetation groundtruth data.

6. Fisheries stock assessment capability, acoustic and trawl, with cables of adequate length to cover the lake bottom (250m desirable).

2. Water Hyacinth Population Biology and Control

A. Analysis of the demographics of water hyacinth, to identify the importance of the Kagera source and possible means of controlling it, and regional variation in life history and demographics of the plant. This is necessary to develop a battle plan. We must have the data needed to properly direct control measures toward the most important source areas, to determine if said measures are doing any good, and to know why they are or aren't. Control of water hyacinth will be a guerilla war, and will not be as simple as pressing a button to release weevils from cages. Guidance of water hyacinth control is dependent upon the mapping resource described below.

B. The weevil's efficacy as a control agent will vary with scale; the question is whether the introduction of a new species is justified by the positive effects that are anticipated. Controlled experiments with the weevil are required to assess how the predator-prey relationship between weevil and hyacinth might vary with size of area treated.

C. Research is needed to develop a combination of approaches to water hyacinth control to achieve the most effective combined impact possible. Every control agent thus far proposed allows for substantial temporal or spatial refugia for water hyacinth populations within the lake basin.

3. Biodiversity Rescue Operations

Time is of the essence for successful inventory of potential refugia for indigenous fishes, and recovery of founder stocks for species conservation. We assign a high priority to critically endangered food fishes ("table fishes"), and haplochromine species that represent ecologically important functional groups that are feared extinct. There are three steps: (1) location of refugia, (2) preservation of refugia where possible, (3) establishment of captive populations of those species most important from both a conservation and a development standpoint. This activity has already been organized as the Lake Victoria Fishes Species Survival Program. It is regulated under the joint auspices of the Captive Breeding Specialist Groups of the IUCN, and the Species Survival Programs of the American and European associations of zoological parks and aquaria (AAZPA, IUDZG).

First priority for the rescue efforts should be the rivers and satellite lakes of the Nabugabo, Kagera, Yala, and Mara regions, and other areas where remnant populations of indigenous species are known to occur. These areas straddle or are relatively close to the borders among the three countries. Thus, the "head start" activity at these sites will provide the added advantage of boosting regional cooperation and promoting the development of a truly international lake basin species conservation effort. Subsequent species rescue strategy should be directed by the GIS data base, which will indicate where lesser-known satellite ponds and potential lake island refugia are located, and how they might best be reached.

Logistics and Division of Labor:

Since research informs all aspects of management, research needs are spread throughout the LVEMP proposal, and involve many of the defined tasks for the preparatory process. However, for practical reasons it is essential that the actual proposal and execution of research under LVEMP be centralized. This is best accomplished by using the existing structure: the four scientific working groups coordinated through the New England Aquarium. As soon as the Lake Victoria (Fisheries) Commission has been established, the main offices for the Research Action Committee should be relocated there, with the Boston (NEAq) continuing to provide expatriate coordination and services as appropriate. At least insofar as research is concerned, this strategy would also provide time to precisely define the scope of work to be carried out over the next four or five years, and thus help to assuage the frequently expressed concern that sudden, major donor funding through the central governments of the host countries would lead to abuse or misallocation of much of this money.

We are hoping that funding for the urgent "head start" research might come from the EEC, which leaves two obvious possibilities for the administration of the funds. The first is that the three riparian nations agree on a venue for the Lake Victoria Commission and get it going right away. Carl thought the fray over site might be resolved by going back to the earlier proposal of Arusha, which is far enough from everybody. The Tanzanians quickly endorsed this option, explaining that they originally preferred a location near the lake but would reverse under the changed circumstances. I will pass the information on to the Kenyans and Ugandans.

The second option that Carl mentioned is to run the funds through an appropriate European organization. Carl recommended the University at Wageningen. I agree- it has many advantages. However, the principals at this institution must not be arbitrarily invested with power over how the money is actually spent; this authority must reside in the Research Action Committee as defined above, whatever its venue. In this regard, it is noteworthy that I have been successful in recruiting Dr. Pieter Kat, a Dutch citizen who recently ended nine years with the National Museums of Kenya- he would be a suitable individual to lead the "head start" effort on behalf of the EEC, probably with Roest administering the project for the EEC in Holland. The possibility of grabbing Kat wasn't discussed until after my conversation with Harbo.

The slate of activities proposed here can be accomplished without the EEC funding the whole thing- some components already exist as funded projects (eg., mapping and characterization of pollution sources in Kenya). Assuming that it is acceptable to the Bank for me to continue to coordinate the RAC (Research Action Committee) activities on the expat side, I plan to draw these other projects into a collaborative effort and a common data base. Anything less than this would be a waste.

For example, at least the following groups are working on water hyacinth and related issues and their efforts must be integrated. Regardless of whatever flags they wish to fly, the interests of the lake and its people demands that they be in close touch with each other. It is hoped that the various interests might honor, or at least coordinate with the Wetland and Riparian Ecosystem Working Groups of the LVEMP:

- i. FAO water hyacinth project.
- ii. National Museums of Kenya wetlands working group.
- iii. IUCN wetlands and water hyacinth working group.
- iv. UFFRO (Twongo) wetlands working group.

Acquisition, analysis, and dissemination of remote sensing data should be the responsibility of the two ecosystem working groups, Lake Ecosystem, and Wetland and Riparian Ecosystem. The four working groups should then operate on the ground in their respective areas to groundtruth and supplement the resulting GIS system to the point where processes can be observed and interpreted truthfully.

Lake Victoria Environmental Management Program
World Bank Global Environment Facility

Draft Working Document for Research
Scope and Tasks

Version: May 30, 1993

Prepared for the World Bank
by

L. Kaufman
New England Aquarium

and the

Lake Victoria Research Implementation Committee

I. Executive Summary

The scientific community in East Africa has a crucial role to play in the future of Lake Victoria and its surrounding communities. In recognition of this, the World Bank has sought the assistance of those now studying the lake to conceive and implement an environmental plan to help stabilize the lake ecosystem and the resources it provides. This plan must also strive to stop the loss of indigenous species that has accompanied a host of recent changes in the lake environment. A Global Environment Facility grant to Kenya, Uganda and Tanzania, the **Lake Victoria Environmental Management Program**, has been proposed as a mechanism to establish sustainable utilization. Information and insight concerning biological diversity, ecological dynamics, fisheries, and the catchment are the lifeline of any such effort. This document outlines a scope of work recommended by the scientific community to forge an information link between lake and decisionmakers, to prime the flow of relevant data across this link, and to bolster the local scientific community so the flow can continue beyond the duration of this grant. The infrastructure needed to actually utilize and act on this information- the administration, physical plant, and urgent mitigation projects- constitutes a separate, parallel component of the proposed GEF grant. The challenge is considerable, and it is assumed that the chances of success will be that much greater if the program outlined here is implemented in the context of complementary support from other donors.

The research program is designed to confront the most pressing lake-related challenges in the areas of natural resources, biodiversity conservation, and socioeconomics. The research could have been organized conceptually in any number of ways. We chose to start with the project structure outlined at Dar es Salaam in October, 1992, since this is the most recent statement of needs as perceived by the host countries. We suggest, however, the addition of two projects: one on the biology of Nile perch, and the other the building of the most basic aspects of research infrastructure and data access to a common level in the three countries, so that their work together is facilitated.

II. The Research Implementation Committee

The World Bank GEF initiative for Lake Victoria delegates responsibility for research to a Research Implementation Committee (RIC). We have formed four scientific working groups to comprise the RIC: Fisheries, Biodiversity, Ecosystem, and Watershed. Leadership of the RIC is invested in eight individuals, one African and one expatriate from each working group, these supported by up to four committee members reflecting a balance of scientific and political experience. Following is the tentative list of working group leaders and committee members. Asterisks denote the group leaders.

Fisheries Biology Working Group

Dr. Bill Kudhongonia (Director, UFFRO, Uganda)*
Dr. Jim Kitchell (University of Wisconsin, USA)*
Dr. James Ogari (Deputy Director Inland Fisheries, KMFRI, Kenya)
Undesignated: representative from Tanzania Fisheries
Tijs Goldschmidt (HEST/TAFIRI, Holland)
Mr. Doug Wilson, (Socioeconomist, Michigan State University, USA)
Dr. Tony Pitcher

Lake Ecosystem Working Group

Dr. Fred Bugenyi (Senior Research Officer, UFFRO, Uganda)*
Dr. George Kling (University of Michigan, USA)*
Mr. Peter Ochumba (Senior Research Officer, KMFRI, Kenya)
Dr. Moshe Gophen (University of Oklahoma, Israel and USA)
Mr. Ernest Yongo (Socioeconomist, KMFRI, Kenya)

Biodiversity Working Group

Dr. Ezekiel Okemwa (Director, KMFRI, Kenya)*
Dr. Les Kaufman (Chief Scientist, New England Aquarium, USA)*
Dr. Frans Witte (University of Leiden, Holland, and HEST/TAFIRI)
Dr. Richard Ogutu-Ohwayo (Research Officer, UFFRO, Uganda)
Dr. D. B. R. Chitemwembwa (Research Officer, TAFIRI, Tanzania)
Dr. Lauren Chapman (University of Florida, USA)

Watershed and Wetlands Working Group

Professor P. O. J. Bwathonde (Director, TAFIRI, Tanzania)*
Dr. Bill Cooper (University of Michigan, USA)*
Dr. Colin Chapman (University of Florida, USA)
Dr. Mohammed Isahakia (Director, National Museums of Kenya)
Dr. Tim Twongo (Senior Research Officer, UFFRO, Uganda)

FBO CIFA Sub-committee
for Lake Victoria
Jinja 10-13/2/92

III. Basis for the Research Program

The outline of research projects and tasks proposed here is the product of five steps:

1. A research agenda and general recommendations were compiled in the Workshop on People, Biodiversity, Fisheries, and the Future of Lake Victoria, held in Jinja August 17-20, 1992 (funded by the US National Science Foundation and the Pew Charitable Trusts). International working groups for Fisheries, Biodiversity, Ecosystem and Watershed emerged from the workshop, along with the endorsement of the notion that a tripartite fisheries commission be established for Lake Victoria.
2. Officials of Kenya, Uganda, and Tanzania met in Dar es Salaam in October 1992, to act on recommendations from the Jinja workshop. The meeting produced the first steps in the creation of a Lake Victoria Fisheries Commission, and a list of specific projects that reflected local needs.
3. The GEF process was initiated with a draft proposal written by Mr. Lars Vidaeus, Principal Economist with the World Bank, based on the two prior documents and the results of a series of meetings with key players in Africa.
4. American leadership of the four working groups met in Lansing, Michigan in March 1993. In this meeting, suggestions were developed to flesh out the tasks outlined in Dar so as to focus technology and expertise from outside Africa on the primary research issues.
5. Meetings were held in Africa between Les Kaufman and African leadership of the four working groups, on behalf of the World Bank, during June 1993.

At this juncture, we place the research plan before the Research Implementation Committee and other interested parties, for consideration and comment. Following this a final scientific scope of work for the GEF project will be written. It will be important at that stage to ensure that the research program integrates properly with proposals to develop physical plant, project coordination, and administrative infrastructure.

IV. Research Tasks

PROJECT #1: Development of Lift Net/Catamaran Fisheries

Rationale: Development and expansion of lift net fisheries for small pelagic species (principally the dagaa, Rastrineobola argentea) are under way in the Mwanza area. As in Lake Tanganyika, the production potential of this fishery is substantial. This project is composed of four tasks:

(A) As the technology expands to Kenyan and Ugandan waters, it becomes essential to estimate the biological, technological, and social and economic basis for a sustainable fishery. (Fisheries, Ecosystem).

(B) A technical training and capitalization/marketing advisory program is needed to guide the development of the new fishery (Fisheries).

(C) A study of the by-catch of non-target species is needed to evaluate and mitigate the ecological impact of the new fishery. The major bycatch of the present dagaa fishery consists of pelagic haplochromine cichlids (fulu). Though presently endangered, these species are ecologically very important and are likely to be needed to play a role in ecosystem management in the future (Biodiversity, Fisheries).

(D) It is important to understand the process by which new techniques are diffused and adopted in this fishery. Most important are the channels and means of communication used by change agents, technical staff, and consultants, as well as the consequences of adoption. For stabilization of the fishery, data are needed on whether (1) existing owners and operators will convert to liftnets, or (2) diversify and operate both liftnets and other, potentially more harmful gear, or (3) owners will diversify while operators remain specialized.

Location: Tanzania for the existing fishery, with additional advisory and research programs in Kenya (Kisumu) and Uganda (Jinja).

Total Project Cost: USD 850,000.

PROJECT #2: Industrial Fish Processing

Rationale: The Nile perch fishery exhibited rapid development, faces potential decline, and has unknown sustainability. We must assess the current and future role of industrial fish processing systems if management is to effectively guide exploitation strategies and economic forces. There are four tasks, all falling under the Fisheries working group:

(A) Secure flow of accurate data on fisheries landings.

(B) Profile the marketing system and assess its implications for employment and end uses of the various target species.

(C) Evaluate economic and social impacts for different structures of the fish processing industry.

(D) Implement monitoring and management tools to maximize efficiency and sustainability of the processing industry.

Location: Based in Kisumu, the program would extend to fisheries in all three countries.

Total Project Cost: USD 400,000.

PROJECT #3: Biology of *Rastrineobola argentea*

Rationale: Fundamental data on distribution and abundance, stock size, basic ecology, and population biology of *Rastrineobola* are required to form a rational basis for management of this fishery, in concert with the goals of Project #1. If, as anticipated, the Nile perch fishery continues its current decline, the dagaa fishery will become the logical focus of expanded effort. Its potential, limitations, and ecosystem function are little known. Four tasks are required.

(A) Basic research is needed to resolve the reproductive biology, early life history, and parameters bearing on recruitment success of *Rastrineobola* (Fisheries, Ecosystem).

(B) The bulk function of *Rastrineobola* in the lake ecosystem should be defined through research on trophic biology, movements, and mortality (Fisheries, Ecosystem, Biodiversity).

(C) In light of the current competition for *Rastrineobola* in the marketplace, it is necessary to fully assess the demand for, and uses of, this species. This analysis should take into account alternative technologies for adoption, operation, and maintenance, and marketing in the fishery, including the social and economic implications of alternative end-uses (Fisheries).

(D) The social and economic impact of a fully-developed fishery should be studied and modelled to forecast the investment, processing, marketing and distribution systems under varying plans for development of the fishery (Fisheries).

Location: Coordinated studies in all three major research centers; UFFRO, TAFIRI and KMFRI.

Total Project Cost: USD 825,000.

PROJECT #4: Lake Basin Pollution

Rationale: The relative contribution of catchment and atmosphere to nutrient loading in Lake Victoria is one of the most important ecosystem-level questions for future management decisionmaking in the Lake Basin. There are three tasks:

(A) There is need for an assessment of point and non-point sources of nutrient and toxic pollutants in the Lake Victoria catchment, and anticipation of likely future changes in this profile (Watershed).

(B) The potential for forest and wetland buffers and changes in land use patterns to contribute to mitigation of nutrient inputs from watershed sources (Watershed).

(C) An assessment of past and current parameters of population, urbanization, industrialization, and land use practices in the Lake Victoria basin is needed. The data should be used to forecast potential economic and employment changes for the next decade, and the potential impacts of alternative development scenarios on the lake ecosystem (all four working groups).

Location: This project would be based in Kenya, with operations extending to Uganda and Tanzania.

Total Project Cost: USD 1,100,000

PROJECT #5: Socioeconomic Research

Rationale: Comparable base-line socioeconomic data on the fisheries of the three countries do not exist. As the fisheries, markets, and economic arrangements change, their dynamics should be monitored with annual iterations of data collection, to track trends in the structure of the industry at all levels, and to assess the impacts of investments, changes in ethnicity and gender, and fisheries regulation, both formal and informal. Of key importance are links among economic growth in the fisheries, social differentiation, and impoverishment: i.e., changes in malnutrition, and morbidity and mortality in infants and children among lake-dependent populations. Advanced training in socioeconomics is a central element of this project.

(A) Socioeconomic and political changes in Uganda fisheries (Fisheries). USD 1,500,000.

(B) Development of coordinated communication and education systems (Fisheries). USD 650,000.

Total Project Cost: USD 2,150,000.

PROJECT #6: Ecosystem Description and Dynamics

Rationale: An ecosystem model for the lake basin is an essential tool for environmental planning and management. The conceptual and analytical framework created through large-scale modeling efforts provides the glue needed to integrate biodiversity, resource, and socioeconomic issues. It is the most effective way to quickly evaluate the scope and complexity of issues pertinent to the future of Lake Victoria. This is the most ambitious of the projects, and is in some respects the most important.

6.1: Ecosystem Description: Assessment of distribution and abundance of key components of the macrofauna.

(A) Biotic inventory: Both species conservation and resource management require data on the species composition, distribution, and abundance patterns of indigenous aquatic organisms. Priorities dictate that the primary foci be placed on indigenous fishes, molluscs, and insects (Biodiversity).

The biotic inventory of Lake Victoria, with a focus on fishes, molluscs, and aquatic insects, will cost USD 2,000,000.

In addition to the assembly and analysis of data, this task requires a major investment in advanced professional training, including (1) establishment of host country teams trained to execute Rapid Assessment Programs (RAP's) for aquatic systems through the Lake Victoria Basin, (2) development of curatorial expertise to permit the maintenance of systematic and living archive reference collections in all three countries, and (3) establishment of the in-country sorting centers and reference collections themselves.

(B) Acoustic assessment of stocks: Decades have passed since the last attempt at a lake-wide assessment of fishery stocks. In that time, the fisheries, the fish community, and the fish habitats have changed dramatically. In addition, stock assessment technology has improved through the development of acoustic methods for evaluating fish distribution and abundance. A contemporary and complete stock assessment is the essential

PROJECT #7: Rehabilitation of Traditional Fisheries

Rationale: Prior to the introduction of exotics, fisheries flourished around the river mouths where migratory species were readily available, and near bays and peninsulas, where vast aggregations of native tilapia were easily caught. The dominant components of the native fisheries were stocks of Labeo, Clarias, Barbus, Bagrus, and the ngege, Oreochromis esculentus. Decline in Nile perch populations will allow some of the stocks to recover or be restored. Fundamental assessments are required of the biology of these species and their habitats, as well as the socio-economic bases of fishing practices and relevant controls. These data are essential for developing rational management plans that will allow their continued recovery and/or protection.

Location: This project will focus on the Kenyan sector.

Total Project Cost: USD 500,000.

PROJECT #8: Fisheries Management and Extension

Rationale: Research is needed to identify current and potential new systems of effective management of the fishery. These systems would be designed to elicit cooperation from the variety of participants who rely on the lake for food, employment, income, and other benefits. The rates of change in the Lake Victoria system require more effective and coordinated policies, planning, and management that incorporate the sum of the research results obtained through the Lake Victoria Environmental Management Program. Local fishery communities must be included and involved in the development of fisheries management philosophies and practices, supportive legislation, educational programs and materials, and management regulations.

Location: Based in Tanzania, this program will be extended throughout Uganda and Kenya.

Total Project Cost: USD 650,000

PROJECT #9: Water Hyacinth

Rationale: The introduced water hyacinth, Eichornia crassipes, poses a severe threat to both indigenous and exotic fishes, and to much of human activity in the nearshore environment; it could also represent a major, but as yet undetermined impact on ecosystem dynamics. An ecological impact analysis is needed on the water hyacinth's functional relationship to the lake and its resources, and particularly, on alternative methods for hyacinth control.

Location: The research will be based in Uganda, with application as appropriate in Kenya and Tanzania.

Total Project Cost: USD 488,000.

PROJECT #10: The Biology of Nile Perch

Rationale: The Nile perch is presently the most valuable fishery resource in Lake Victoria, yet despite recent work there is still little known about its basic biology. This is especially true with regard to three areas:

(A) early life history (Fisheries).

(B) physiological tolerances and their implications for predator-prey interactions (Fisheries, Ecosystem).

(C) patterns of movement of juveniles and adults (Fisheries, Biodiversity).

Location: Kenya, Tanzania, and Uganda, with each country specializing on one the three tasks.

Total Project Cost: USD 500,000.

PROJECT #11: Research Infrastructure

Rationale: Assuming that sufficient support for immediate needs in terms of research equipment is included in the previous projects, there still remains a critical need for a foundation of trained ecologists and fishery scientists who have adequate access to the global knowledge base, especially the full panoply of extant research on Lake Victoria and its basin. Today, in the lakeside institutes and fishery departments and universities, that research literature and equipment base is grossly inadequate. Support for equipment and training is needed to build capacity for computerized data analysis and for a microfiche and CD-ROM library of all research literature on Lake Victoria and its basin, including the biological, limnological, physical, socio-economic, and historical databases.

Location: All three countries, encompassing the fishery research and fisheries departments, universities, and museums, according to greatest need, so that all are functional.

Total Project Cost: USD 750,000.

- 4
- (c) Strengthening and harmonization of national regulatory and incentive frameworks to achieve regional water quality objectives. Preparation would comprise the following:
- (i) reviewing national legislation and incentives with regard to activities that directly or indirectly impact water quality;
 - (ii) proposing appropriate revisions to such legislation to enable harmonization of national regulations with regional water quality objectives; and
 - (iii) identifying major differences in national incentive structures and their impact on water quality in various parts of the lake.
- (d) Monitoring water quality and enforcement of regulations. The preparation would focus on:
- (i) defining monitoring objectives (parameters to be monitored, frequency, density of monitoring stations) and methods of analysis; identifying existing institutional responsibilities and building from national components an integrated monitoring program for the whole lake, redefining where necessary institutional responsibilities and linking wherever feasible with international efforts such as TECCONILE (HYDROMET); preparing a detailed action program with cost estimates for design and implementation of a regional water quality monitoring system, including strengthening of laboratories; and
 - (ii) reviewing institutional arrangements for enforcement of standards and regulations governing water quality; preparing proposals to strengthen the institutional capacity at the regional level and at the appropriate level in each country to enforce such legislation.
- (e) Programming of investment requirements. The preparation would focus on :
- (i) establishing appropriate technical standards for sewerage collection and treatment facilities (different types and quantities of sewerage from industry and local communities);
 - (ii) taking stock of different sources of pollution (type and quantity) at the national level;
 - (iii) preparing investment proposals for a few critical situations in each country (to be executed during project implementation); and
 - (iv) identifying resources required during the implementation of the proposed program for preparation of a priority investment program for pollution control for Lake Victoria as a whole (without considering national boundaries).
- (f) Management of agricultural pollution (land use in the catchment). The aim would be to promote surveys, research and monitoring to improve the information about

the amounts of nutrients, silt and toxic materials that enter the lake through agricultural activities in the catchment and to pin-point the main sources and movement of such pollutants. This would include monitoring of changes in vegetative coverage and review development plans involving major changes of land use in the catchment. The preparation would focus on:

- (i) surveying of existing information and research on the inflow of nutrients and silt to identify critical sources of such agricultural pollution;
 - (ii) proposing a system for monitoring land use changes in the catchment; and
 - (iii) identifying resource requirements for preparing and executing investment proposals to deal with a few critical sources of agricultural pollution.
- (g) Management of Wetlands. The focus would be on changes in wetland use and may be closely coordinated with the efforts to define and implement national wetland policies. The preparation would focus on:
- (i) surveying historical and planned changes in wetland use in the lake catchment;
 - (ii) undertaking a few case studies in each country on the local motivation for and the consequences in terms of production, income and sustainability of actual or contemplated changes of wetland use, and the resulting impact on the lake;
 - (iii) identifying existing research on impact of changes in wetland use on local production, income and sustainability and on the lake and suggest research to close knowledge gaps;
 - (iv) reviewing efforts to mitigate adverse impacts of changes in wetland use on the lake and suggest research/testing of possible approaches; and
 - (v) recommending possible changes in national and regional wetland policies from a lake perspective.

Terms of Reference for Organizational Entities

1. National Working Group on Fisheries Management and Water Hyacinth Control (3)

- (a) Prepare proposal for strengthening national monitoring (data collection of catches and efforts, processing and marketing etc.), fisheries extension, monitoring and enforcement.
- (b) Prepare national proposal on minimum fish size for processing to be considered by the Regional Task Force 1 and its consultants in the preparation of a regional management proposal.
- (c) Review draft proposals by the Regional Task Force 1 and its consultants on a priority research program.
- (d) Identify optional arrangements for funding fisheries extension, monitoring and enforcement for consideration by the Regional Task Force 1 and its consultants, and review the draft final proposals by the Regional Task Force 1.

2. National Working Group on Management of Water Quality and Land Use (including Wetlands) (3)

- (a) Review national legislation and institutional capabilities to enforce regulations concerning industrial and municipal discharges.
- (b) Review and prepare proposals for improving standards for industrial pollution.
- (c) Review and prepare proposals for improving standards for municipal pollution, including the collection and treatment of sewerage.
- (d) Review historical and planned changes of land use in the catchment and propose a system to monitor such changes.
- (e) Identify critical sources of agricultural pollution.
- (f) Review existing research and propose priority research activities to determine the impact of agricultural pollution on the lake.
- (g) Survey historical and planned changes of wetland use.
- (h) Review existing research on impact of changed wetland use on the lake and propose research to close knowledge gaps.
- (i) Review remedial measures and propose, where necessary, further research/testing.

3. National Secretariat (3)

- (a) Review and approve work programs for the National Working Groups.
- (b) Provide logistics support to the National Working Groups.
- (c) Monitor the progress of work program implementation of the National Working Groups.
- (d) Review the output of the National Working Groups, prepare the national position on the management issues under their respective mandates, and report this position to the Regional Secretariat.

4. Regional Task Force 1: Fisheries Management and Water Hyacinth Control

- (a) Prepare establishment of Fisheries Commission.
- (b) Prepare proposal on minimum fish size for processing.
- (c) Prepare priority research program.

Chuk Falls

- (d) Review funding options for fisheries extension, monitoring and enforcement.
- (e) Consider conclusions from national reviews of the scope for strengthening extension, monitoring and enforcement (item 1 (a)).
- (f) Establish monitoring of water hyacinth occurrence.
- (g) Design pilot projects for eradication of water hyacinth.
- (h) Prepare plans to ensure availability of adequate facilities for propagation of biological control agents.
- (i) Survey and design methods to deal with sources of hyacinth infestation.
- (j) Test technical and economic feasibility of methods for water hyacinth utilization.

(k) ~~Public~~ Prepare public education programming.
 5. Regional Task Force 2: Management of Water Quality and Land Use (including Wetlands)

- (a) Prepare proposal to improve monitoring of water quality at regional scale.
- (b) Identify important knowledge gaps on the absorption and circulation of pollutants and propose priority research areas.
- (c) Review proposals of National Working Groups and consultants and prepare final regional programs for items 2 (a) to 2 (i).

(d) Prepare public education programming.
 6. Regional Policy and Steering Committee (assisted by a Regional Secretariat)

- (a) Hold inception, midterm and final review meetings, and prepare materials for these meetings.
- (b) Approve work programs and monitor progress of regional task forces.
- (c) Prepare project preparation report.
- (d) Recommend policy changes to governments.

Consultant Requirements for Preparatory Program

A. Summary of Tasks and Inputs

Task	Personmonths ^{1/}
1. Chairman, Regional Policy and Steering Committee	3*
2. Executive Secretary, Regional Secretariat	6*
3. Head of National Secretariats (3x6)	18*
4. Preparing for the Establishment of the Fisheries Commission	FAO TCP
✓ 5. Preparing a common policy to regulate minimum sizes for processing of Nile Perch	4 -
✓ 6. Drafting a priority research program in various fields	8 -
* 7. Reviewing funding options for fisheries extension, monitoring and enforcement	2 ✓
✓ 8. Reviewing means of strengthening fisheries extension, monitoring and enforcement (3x3)	9 -
✓ 9. Preparing proposals for strengthening water quality monitoring and for research priorities (3x3)	9 -
10. Reviewing national legislation and institutions in relation to discharge of pollutants into water courses and lakes	4
11. Proposing standards for industrial pollution	2
12. Proposing standards for collection and treatment of communal discharges	3
13. Identifying critical sources of industrial and communal pollution and preparing investment proposals (3x5)	15
14. Reviewing sources of agricultural pollution (3x3)	9
✓ 15. Reviewing changes in wetland use and analysing impact on lake (3x3)	9 -
16. Controlling Water Hyacinth	FAO TCP
Total	101

^{1/} Recruitment is expected to be a mix of local and international consultants. As an absolute minimum local consultants would be required for the tasks marked by asterisks.

B. Consultant Job Descriptions (JDs)

JD 1: Chairman, Regional Policy and Steering Committee

Tasks:

- call and chair review meetings (inception, midterm, final) and meetings of policy/steering committee;
- promote recommendations of policy/steering committee in relation to the three Governments; and
- clear material to be presented to review meetings and policy/steering committee.

Qualifications:

- highly regarded civil servant acceptable to all three countries;
- experience in regional collaboration; and
- experience in policy analysis and government processing.

JD 2: Executive Secretary, Regional Secretariat

Tasks:

- serve as secretary to Regional Policy and Steering Committee;
- assisted by the heads of the national secretariats (JD 16), lead the drafting of material for the midterm and final review meetings;
- monitor and guide the preparation process;
- together with heads of national secretariats draft the project preparation report; and
- provide logistical support to the regional collaboration including transport and travel between countries (within a given country, consultants would be assisted by the national secretariat), secretarial assistance in connection with regional deliberations, payment of allowances, recruitment of consultants, procurement, organization of study trips, and accounting.

Qualifications:

- managerial experience;
- experience of project preparation;
- working experience in the field of environmental protection;
- experience of policy analysis; and

- ability to collaborate broadly with interest groups and NGOs.

JD 3: Head of National Secretariats

Tasks:

- assist the national members of the Regional Policy and Steering Committee in the formulation of a national position in relation to items before the committee;
- assist the Executive Secretary of the Regional Secretariat in the drafting of material for the midterm and final review meetings and in the compilation of the draft preparation report;
- monitor and integrate the work of the two national working groups; and
- provide logistical support for consultants and the NWGs, including transport, secretarial assistance, payment of allowances, and accounting.

Qualifications:

- managerial experience;
- working experience in environmental protection;
- government experience in processing policy issues; and
- ability to collaborate broadly with with local interests and NGOs.

JD 4: Establishing the Fisheries Commission (FAO/TCP project)

Task: Assist Governments in

- facilitating the adoption of the Lake Victoria Fisheries Commission protocol;
- elaborating related operational procedures, staffing and budgetary requirements; and
- establishing initial work program and priorities for joint consideration of policy issues.

Qualifications:

- fisheries management consultant.

JD 5: Preparing a Common Policy to Regulate Minimum Sizes for Processing of Nile Perch

Task: Assist the Regional Task Force 1 (Fisheries Management and Water Hyacinth Control) in:

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- 4
- outlining consequences of a lack of common policy in terms of (i) gears used, (ii) sustainability of fisheries and the fishing industry, and (iii) proportion of income derived from "small" fish and short term and long term consequences for income from fisheries;
 - surveying existing national policies and enforcement; and
 - drafting proposals for appropriate policy and enforcement with due consideration to measures needed to overcome adverse short term socio-economic effects.

Qualifications: Scientists in the field of:

- fisheries biology (population dynamics);
- socio-economic analysis of consequences for fishing communities in the three countries.

JD 6: Drafting a Priority Research Program in the Fields of Fisheries Biology, Stock Assessment, Limnology, Biodiversity Conservation, Population Genetics, and Socio-economic Consequences of Policy Change

Task: Assist the Regional Task Force 1 (Fisheries Management and Water Hyacinth Control) in:

- surveying existing research programs, sources of funding and capacity of existing research institutions;
- reviewing existing documentation, including documentation produced in connection with the Jinja and Dar-es-Salaam meetings in 1992, EC, IDRC, US (NSF), with the aim of synthesizing a priority research program within alternative resource frames;
- proposing ways of strengthening institutional capabilities;
- suggesting ways of sharing responsibilities between the regional institutions and the role of international scientists and institutions including in the training of local scientists; and
- suggesting mechanisms for regional and international exchange of information and experience.

Qualifications:

- scientists (4) in the fields of fisheries biology, stock assessment, limnology, biodiversity conservation, population genetics and socio-economic analysis recruited from UFFRO, KEMFRI, TAFIRI, and internationally.

JD 7: Reviewing Funding Mechanisms for Fisheries Extension, Monitoring and Enforcement

Tasks: Working through the National Working Groups, assist the Regional Task Force 1 (Fisheries Management and Water Hyacinth Control) in:

- reviewing present methods and level of funding of these services (budget, releases, balance salary/operating funds) in the three countries;

- exploring options to mobilize resources, including (i) tax on exports, (ii) registration fees on fishing vessels, (iii) improved collection of penalties fines, (iv) private/cooperative funding of extension, (v) enhanced budgetary allocations, and (vi) possibilities for establishing "Fisheries Development Funds" (cf Tanzania) to retain part of revenue from taxes and fees on fisheries for development purposes; and
- providing guidance on expected resource frame for planning these services.

Qualifications:

- consultant experienced in fisheries administration and public finance.

JD 8: Reviewing Means of Strengthening National Fisheries Extension, Enforcement and Monitoring

Tasks: Assist the National Working Groups in:

- analysing the strengths and weaknesses of existing services;
- determining present and future objectives in relation to (i) monitoring (data on catches and effort, processing, transport and marketing, consequences of policy interventions; see previous IFIP papers etc.), (ii) extension (what should be extended?), and (iii) enforcement (regulations, balance between extension/enforcement in promoting policies);
- exploring prospects for enhancing efficiency in (i) methods used, (ii) participatory approaches, (iii) balance staff/equipment/funds, and (iv) training; and
- within likely resource frame (JD 7), suggesting ways to strengthen national services.

Qualifications:

- fisheries administration expert with international experience.

JD 9: Preparing Proposals for Strengthening Water Quality Monitoring and for Research Priorities

DANIDA/UNEP to propose

JD 10: Reviewing National Legislation and Institutions in Relation to Discharge of Pollutants into Water Courses or Lakes

Tasks: Working through the National Working Groups, assist the Regional Task Force 2 (Management of Water Quality and Land Use, including Wetlands) in:

- reviewing national legislation regulating discharge of pollutants from industry and municipalities/communities;

- identifying differences between such national legislation and determine its comprehensiveness;
- analysing institutional responsibilities and capacities in enforcing such regulations, and determine penalties and incentives provided to promote legislation; and
- preparing an action plan (including the required TORs) for further work to harmonize and strengthen legislation and enforcement.

Qualifications:

- lawyer with international experience of this type of legislation.

JD 11: Proposing Standards for Industrial Pollution

Tasks: Working through the National Working Groups, assist the Regional Task Force 2 (Management of Water Quality and Land Use, including Wetlands) in:

- surveying existing standards for industrial discharges and their application in practice;
- proposing a phased programme for gradual improvement of standards and their implementation with due consideration to the economic and technical feasibility; and
- proposing methods of monitoring the adherence to such standards.

Qualifications:

- industrial pollution expert with LDC experience.

JD 12: Proposing Standards for Collection and Treatment of Communal Discharges

Tasks: Working through the National Working Groups, assist the Regional Task Force 2 (Management of Water Quality and Land Use, including Wetlands) in:

- surveying existing standards for sewerage treatment and their application;
- proposing standards for different types and sizes of municipal collection and treatment facilities; and
- proposing methods for monitoring the adherence to such standards.

Qualifications:

- engineer with LDC experience.

JD 13: Identifying Critical Sources of Industrial and Municipal Pollution and Preparing Investment Proposals

Tasks: Assist the National Working Groups in:

- assessing pollution caused by major municipalities and industry in the catchment;
- reviewing present plans to deal with critical situations; and
- drafting investment proposals in relation to 2-3 remaining critical situations, including analysis of technical economic and financial viability.

Qualifications:

- engineer with LDC experience, economist/financial analyst.

JD 14: Reviewing Sources of Agricultural Pollution

Tasks: Assist the National Working Groups in:

- determining major changes in land use in the catchment, survey existing information and research on the inflow of nutrients and silt and identify critical sources;
- proposing a system for monitoring future land use changes (with consideration to the use of remote sensing) within the catchment and a research program to determine the impact of such changes on the lake; and
- reviewing development plans involving major changes in land use and advice on the expected impact on the lake environment.

Qualifications:

- agricultural economist with experience of remote sensing and watershed development.

JD 15: Reviewing Changes of Wetland Use and Analysing Impact on Lake

Tasks: Assist the National Working Groups in:

- surveying historical and planned changes in wetland use;
- undertaking a few case studies on the motivation for, and the consequences in terms of production, income and sustainability of changes in wetland use and the resulting impact on the lake;
- identifying existing research on the impact of changes in wetland use and suggest research to close knowledge gaps;
- reviewing efforts to ameliorate adverse impacts on the lake of changes in wetland use and propose research and/or testing; and
- recommending possible changes in wetland policy from lake perspective.

Qualifications:

- agricultural economist with wetlands experience.

JD 16: Controlling Water Hyacinth

FAO/TCP to provide

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Preliminary Estimate of Resource Requirements

		US\$
A.	Regional Policy and Steering Committee and Regional Secretariat	
	1. Consultants	30,000
	2. Workshops	36,000
	3. Report preparation	15,000
	4. Secretarial services	10,000
	5. Equipment	50,000
	Sub-total	141,000
B.	Regional Task Forces (2)	
	1. Member travel and allowances	23,000
	2. Consultants fees and travel	980,000
	3. International study trips	90,000
	Sub-total	1,093,000
C.	National Secretariats (3)	
	1. Staff and consultants	75,000
	2. Equipment	270,000
	3. Operating costs	105,000
	Sub-total	450,000
D.	National Working Groups (6)	
	1. Allowances and per diem	81,000
	Sub-total	81,000
	Base cost	1,765,000
	Contingencies, 15 percent	264,750
	Total cost	2,029,750

Action Plan for Program Preparation

Key Actions	Target Date for Completion
1. Execute Collaboration Agreement	7/93
2. Request GEF/donors for preparatory funding	7/93
3. Appoint members to Working Groups, Task Forces, Secretariats, etc.	8/93
4. Complete preparations for tendering of consultant services and other procurement	9/93
5. Appointment of consultants	10/93
6. Procurement of equipment	10/93
7. National Working Groups meeting	10/93-2/94
8. Regional Task Forces meeting	10/93-3/94
9. Completion first draft of Preparation Report	05/94
10. Policy Steering Committee meetings	
Inception Meeting	10/93
Mid-Term Review	01/94
Final Review	05/94
10. Review by Governments	06/94
11. Request by Governments to donors for program appraisal	07/94
12. Regional Seminar	08/94

LAKE VICTORIA ENVIRONMENTAL MANAGEMENT PROGRAM
PROPOSED ORGANIZATIONAL STRUCTURE FOR PREPARATORY PHASE

