

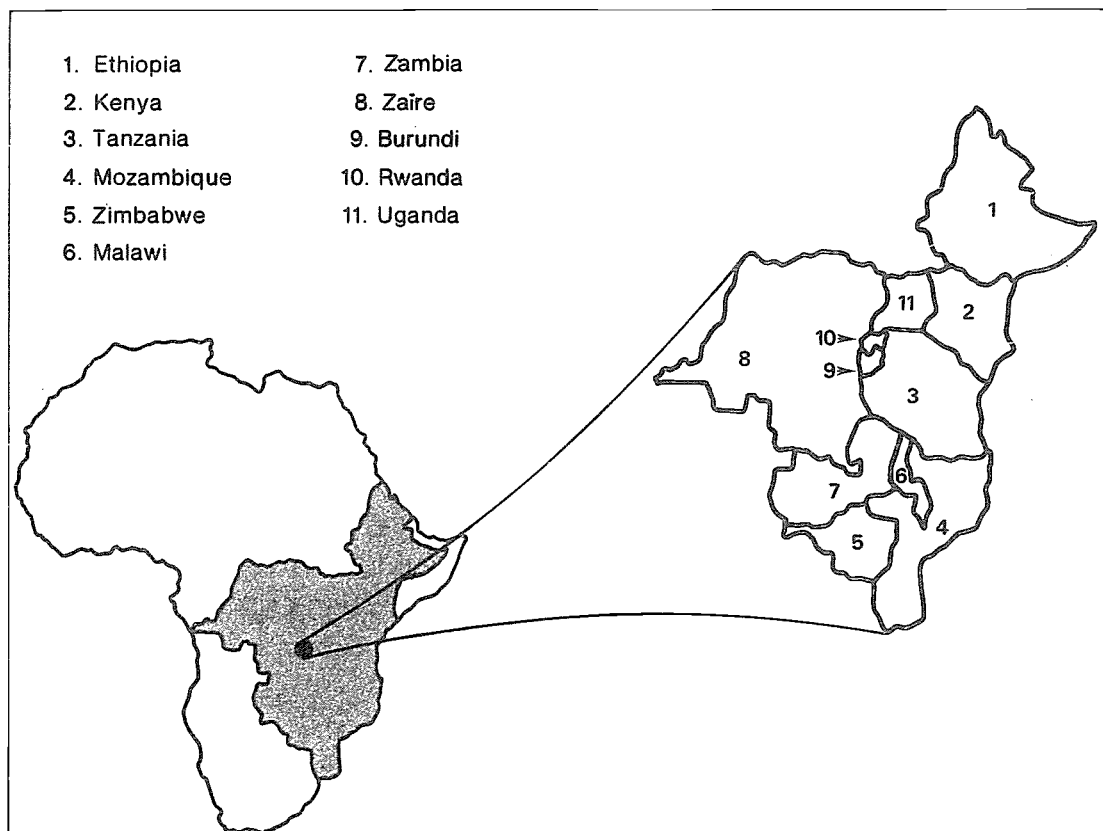
REGIONAL PROJECT FOR INLAND FISHERIES PLANNING, DEVELOPMENT AND  
MANAGEMENT IN EASTERN/CENTRAL/SOUTHERN AFRICA (I.F.I.P.)

## IFIP PROJECT

RAF/87/099-WP/15/92 (En)

September 1992

The fisheries of Lake Victoria:  
summary of project activities to date



UNITED NATIONS DEVELOPMENT PROGRAMME



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS



RAF/87/099-WP/15/92 (En)

September 1992

The fisheries of Lake Victoria:  
summary of project activities to date

Compiled by

D. Gréboval  
- IFIP Project -

The conclusions and recommendations given in this and other reports in the IFIP project series are those considered appropriate at the time of preparation. They may be modified in the light of further knowledge gained at subsequent stages of the Project. The designations employed and the presentation of material in this publication do not imply the expression of any opinion on the part of FAO or UNDP concerning the legal status of any country, territory, city or area, or concerning the determination of its frontiers or boundaries.

PREFACE

The IFIP project started in January 1989 with the main objective of promoting a more effective and rational exploitation of the fisheries resources of major water bodies of Eastern, Central and Southern Africa. The project is executed by the Food and Agriculture Organisation of the United Nations (FAO), and funded by the United Nations Development Programme (UNDP) for a duration of four years.

There are eleven countries and three intergovernmental organisations participating in the project: Burundi, Ethiopia, Kenya, Malawi, Mozambique, Uganda, Rwanda, Tanzania, Zambia, Zaire, Zimbabwe, The Communauté Economique des Pays des Grands Lacs (CEPGL), The Preferential Trade Area for Eastern and Southern African States (PTA) and the Southern African Development Coordination Conference (SADCC).

The immediate objectives of the project are: (i) to strengthen regional collaboration for the rational development and management of inland fisheries, particularly with respect to shared water bodies; (ii) to provide advisory services and assist Governments in sectoral and project planning; (iii) to strengthen technical capabilities through training; and (iv) to establish a regional information base.

PREPARATION OF THIS DOCUMENT

The present document contains a review of major activities undertaken by the IFIP project since early 1989 in support of the management of Lake Victoria fisheries. These activities relate to the strengthening of the information base required for proper planning, as well as to regional cooperation for coordinated research and management. The document was prepared by Dr. D. Gréboval, Coordinator of the IFIP project, with inputs from IFIP staff.

IFIP PROJECT  
FAO  
B.P 1250  
BUJUMBURA  
BURUNDI

IFIP PUBLICATIONS

Publications of the IFIP project are issued in two series:

A series of technical documents (RAF/87/099-TD) related to meetings, missions and research organized by the project.

A series of working papers (RAF/87/099-WP) related to more specific field and thematic investigations conducted in the framework of the project.

For both series, reference is further made to the document number (15), the year of publication (92) and the language in which the document is issued: English (En) or French (Fr).

For bibliographic purposes this document  
should be cited as follows:

Gréboval D., 'The fisheries of Lake Victoria: summary of  
1992 project activities to date'. UNDP/FAO Regional  
Project for Inland Fisheries Planning (IFIP).  
RAF/87/099-WP/15/92 (En): 24p

TABLE OF CONTENTS.

	Page
INTRODUCTION.....	1
1. STRENGTHENING OF THE INFORMATION BASE AND RESEARCH.....	1
1.1 Survey of fishing Gear.....	1
1.2 Census of fishing vessels (Kenya).....	2
1.3 Socio-economic survey of boat owners (Kenya).....	2
1.4 A review of fisheries inputs in Kenya, Uganda and Tanzania..	2
1.5 Technico-economic investigation on the use of lift nets in harvesting <u>Rastrineobola argentea</u> (Tanzania).....	3
1.6 Marketing survey in Mwanza region (Tanzania).....	3
1.7 Socio-economic surveys in Kagera region (Tanzania).....	4
1.8 Assessment and planning for improved fish processing (Kagera Region).....	4
1.9 Study tours.....	4
2. REGIONAL COOPERATION AND MANAGEMENT	
2.1 Assistance to CIFA Sub-Committee meetings.....	4
2.2 Symposium on socio-economic aspects of Lake Victoria fisheries.....	5
2.3 Lake Victoria Statistics Workshop.....	5
2.4 Management seminars of the riparian states of Lake Victoria.....	8
2.4.1 Summary of main conclusions and recommendations for the Kenyan seminar.....	8
2.4.2 Summary of main conclusions and recommendations for the Ugandan seminar.....	10
2.4.3 Summary of main conclusions and recommendations for the Tanzania seminar.....	13
2.5 Coordinated research on <u>Rastrineobola argentea</u> .....	16
2.6 Organization of a regional management seminar.....	17
LIST OF IFIP REPORTS - LISTES DES RAPPROTS PPEC.....	19





## INTRODUCTION

Since 1989, IFIP has undertaken a range of activities in support of the development and management of Lake Victoria's fisheries. These activities fall into two major categories : the strengthening of the information base as an instrument of improved decision-making, and the support to regional cooperation for coordinated research and fisheries management. In line with the major thrust of the project, these activities have focused primarily on socio-economic aspects, and sub-regional cooperation.

During its first phase, 1989-1992, the strategy of the project has been to complement the information base and to allow ample concertation at national and regional levels on major issues related to the management of the three major fisheries (Lates niloticus, Oreochromis niloticus and Rastrineobola argentea). Project activities undertaken in this context relate to the main objective of supporting the gradual elaboration of national and regional management plans for the fisheries of the lake, as stipulated in the project document.

The implementation strategy followed for this programme has been one of maximum involvement of local fisheries researchers and administrators. The strategy aims at a greater and longer-term impact through giving more responsibility to fisheries staff and present the advantage of providing complementary on-the-job training or exposure to a range of technical aspects of research and management.

The major activities undertaken by the IFIP project in relation to Lake Victoria are briefly reviewed below. These include activities for which IFIP support was specifically requested by the CIFA Sub-Committee at its Fifth Session in September 1989 : organization of a regional workshop on statistics; review of the institutional framework for regional cooperation in management.

### 1. STRENGTHENING OF THE INFORMATION BASE AND RESEARCH

#### 1.1 SURVEY OF FISHING GEAR

The IFIP project financed a survey of fishing gear around Lake Victoria in 1990. The catalogue issued gives details and illustrations of a representative selection of canoes and fishing gear currently in use by the small-scale artisanal fishermen of Lake Victoria. It also lists and illustrates those fish which figure most significantly in the official commercial statistics.

The purpose of this booklet is to provide masterfishermen, fish technologists, fisheries officers, training officers and extension workers with a brief description of the factors which influence fishing on Lake Victoria together with descriptions of the most common and representative fishing gear and craft in current use. It is hoped that this information will provide an improved understanding of the equipment and methods currently in use, and a basis upon which advice and future technological improvements can be made.

## 1.2 CENSUS OF FISHING VESSELS (KENYA)

A census of boats, gear and engines was carried out from 10 to 31 May 1991 by IFIP in collaboration with the Kenya Marine and Fisheries Institute (KMFRI) and the Department of Fisheries (DOF). The study location was the entire Kenyan shoreline of Lake Victoria and all inhabited islands. The findings should lead to a review of previous assumptions of fishing effort and total catch and catch by gear, species and the boat registration system. For the purpose of data collection a form was used, each row representing a boat and each column a characteristic of the boat. The recorded characteristics were: boat registration number or sequential number (in the case of unregistered boats); type of boat; active/non-active; resident/visiting; if not active, repairable or not repairable; engine and gear operated from the boat). A total of 80 recorders collected the data under supervision of three Kenyan researchers and one IFIP staff.

The boats in minor beaches were recorded on the form of the nearest beach (of 10 or more active boats). A total of 208 beaches were recorded of which 177 on the mainland and 31 on the islands. In these beaches 7279 boats were enumerated of which 6229 were recorded as active and 1048 and inactive. The overall proportion of unregistered active boats was found to be 20 %. The most widespread type of boat was the Sese canoe followed by the Taruma. Only a very small number of dugout canoes were encountered. The prevailing fishery type was the Nile perch gillnet fishery (31.3 % of all active boats) followed by longlining (16.8 %) and tilapia gill netting (16.8 %). Almost 50 % of the boats target directly for Nile perch. The importance of various fishery types varied significantly according to fishing area. One seventh of all active boats appeared to have migrated out of their original district of registration. A distinct migration from the Nyanza gulf to the open waters was noted.

In view of the current findings present and possibly historical catch figures should be (re)calculated using a 25 % higher raising factor. Due to under registration of boats the boat registration system does not provide a reliable estimate of the total number of boats active on the lake.

## 1.3 SOCIO-ECONOMIC SURVEY OF BOAT OWNERS (KENYA)

As a follow up to the census a socio-economic survey of boat owners was conducted in July-August 1991 in collaboration with KMFRI and the DOF. Five researchers from these institutions and one IFIP staff were involved in data collection in 34 sampled beaches. A total of 375 boat owners were interviewed. The sample was drawn from the census frame distinguishing three geographical strata and two beach size (number of active boats) classes. The topics included in the survey related to geographical and occupational mobility, ownership patterns of boat, gear and engine, use of credit, share systems, crew mobility, marketing channels, socio-demographic characteristics of the boat owner and his family, agricultural and animal husbandry activities and fishery related attitudes and opinions. The results of the survey have just been published by the project.

## 1.4 A REVIEW OF FISHERIES INPUTS IN KENYA, UGANDA AND TANZANIA

A survey of fisheries inputs (boats, engines, nets, etc.) was undertaken in Kenya, Tanzania and Uganda. The survey was undertaken in August 1990 by a consultant in close collaboration with the Fisheries Departments of the three

respective countries. Although the study relates to the marine and inland fisheries of the three countries, special reference is given to Lake Victoria. The review focusses especially on the following aspects:

- supply and demand for main inputs,
- factory and retail prices,
- relative importance of the public and private sectors in the manufacturing, importation and distribution of fishing inputs,
- specific economic incentives and disincentives,
- relative importance of local and imported inputs,
- credit availability,
- state of local input factories.

The resulting document presents the findings, comparing the situation prevailing in the three countries. It ends with recommendations for the individual countries and recommendations of a more general nature.

#### **1.5 TECHNICO-ECONOMIC INVESTIGATION ON THE USE OF LIFT NETS IN HARVESTING RASTRINEOBOLA ARGENTEA (TANZANIA)**

The IFIP project financed a study on the possibility of introducing new fishing techniques in Tanzania. Two Kenyan researchers were invited to undertake the study: James Siwo Mbuga, Fisheries Technologist of the Fisheries Department, and Ernest Ondiek Yongo, Marketing Economist of the Kenyan Marine and Fisheries Institute.

The study showed that lift nets, purse seines and scoop nets are the most efficient harvesting techniques compared to other gear. The lift net/catamaran, introduced in 1990 in Tanzania (Mwanza area) from Lake Tanganyika by small scale fishermen appears to be most promising and could well be the most cost-effective method. Although it is slightly more capital intensive than other techniques, its more intensive use and eventual transfer to Kenya and Uganda was seen as the main priority for the harvesting of dagaa. These units indeed show very high catch rates compared with any other small scale fishing units. The authors recommended that a project be established whereby experimental catamaran and trimaran lift nets units be introduced to ascertain their viability to Kenyan waters. Subsequently, the authors propose a loan scheme similar to the one implemented in the Kigoma region with the support of FAO be considered for Lake Victoria region.

#### **1.6 MARKETING SURVEY IN MWANZA REGION (TANZANIA)**

In the context of IFIP and in close collaboration with the Tanzanian Fisheries Research Institute (TAFIRI), a socio-economic study is being conducted of fish marketing structure in Tanzania (Lake Victoria). The marketing system is being studied in order to provide essential information for planning and management of the Tanzanian fisheries. The research focuses on a major market situated near Mwanza (Mwaloni Kiumba) and provide for an assessment of marketing structures, quantities and prices, margins and destinations.

The researchers have started their investigation of the Mwaloni Kirumba market in July 1992. The fieldwork is expected to take place over a total period of three months and the report will be made available during the last trimester of 1992. The output is expected to contain a description of the present marketing situation and recommendations to improve fish marketing and

distribution in the Mwanza region. The scope of the study could be extended to the Musoma and Bukoba areas at a later stage.

### **1.7 SOCIO-ECONOMIC SURVEYS IN KAGERA REGION (TANZANIA)**

In collaboration with the UNDP-FAO project 'Integrated Fisheries Development in Rural Fishing villages' (URT/90/005), IFIP has initiated an household survey in the Kagera region. The major objectives of this Bukoba-based project are to increase fish production and to promote related income generating activities. Spin-of effects are expected on social community development.

In February 1992, IFIP assisted with the elaboration of a programme and work plan for the conduct of socio-economic investigations. This was done in the context of the requirements of the Bukoba project, and in close collaboration with FAO project GCP/INT/467/NOR 'Strengthening of the Role of Fisheries in Alleviating Malnutrition'. It was decided to undertake a three-steps socio economic survey programme to provide insights into a range of topics related to the planning and monitoring of project activities and the assessment of project impact.

This programme consist of a full-scale household census to be carried out over the whole project area; a more in-depth socio economic baseline study; and of topic-specific surveys designed to address in details issues such as credit supply. The census and the baseline survey have been initiated, and census data have been processed at IFIP Headquarters in July. A joint report will be published by the projects concerned.

### **1.8 ASSESSMENT AND PLANNING FOR IMPROVED FISH PROCESSING (KAGERA REGION)**

This activity has also been conducted in collaboration with the aforementioned Bukoba project. It focused on the assessment of existing fish processing technologies and of the possibility of introducing improved fish handling and smoking techniques. Two missions of a total duration of about 3 months were undertaken in this context by one IFIP staff.

Fish handling and smoking techniques were assessed as being overall quite deficient in relation to product quality and in terms of financial returns and marketing opportunities. Recommendations were made for a range of small improvements and for the introduction of the Fante-Banda as well as the Altona ovens.

### **1.9 STUDY TOURS**

The IFIP Project has also sponsored several study tours around Lake Victoria. This has enhanced collaboration and exchange of information among fishery administrators and research officers working in the Riparian States of Lake Victoria.

## **2. REGIONAL COOPERATION AND MANAGEMENT**

### **2.1 ASSISTANCE TO CIFA SUB-COMMITTEE MEETINGS**

IFIP has provided technical assistance to the organization of the last two sessions of the CIFA Sub-Committee for Lake Victoria. The Fifth Session was held in Mwanza in September 1989 and provided useful guidelines for

further activities to be undertaken by the project. The Sixth Session was held in Jinja in February 1992 and focused on worrisome proliferation of the Water Hyacinth as well as on the creation of regional Lake Victoria Fisheries Commission. IFIP provided the Chairman of the Sub-Committee with a study tour aimed at assessing the possibility of establishing such a Commission prior to the meeting of the Sixth Session. Continued support from the part of IFIP and FAO was requested concerning this issue.

## 2.2 SYMPOSIUM ON SOCIO-ECONOMIC ASPECTS OF LAKE VICTORIA FISHERIES

A Symposium was organized on socio-economic aspects of Lake Victoria fisheries by IFIP during 25 to 27 April 1990 in the interval of time separating the fifth and sixth session of the CIFA sub-committee. The symposium, which took place in Kisumu, Kenya, provided an opportunity for participants to discuss socio-economic aspects related to the following major topics:

- a) General evolution of the fisheries systems;
- b) Harvesting;
- c) Input supply;
- d) Processing and Marketing;
- e) Industrial fisheries activities;
- f) Socio-economic surveys/monitoring;
- g) Research & Development activities;
- h) Management.

The participants (the symposium was open to fisheries administrators, researchers industry representatives and was attended by 36 participants from Kenya, Tanzania, Uganda and FAO) were invited to present a paper on one these topics. Twelve papers prepared for the symposium were subsequently issued in the Proceedings of the Symposium. A report presenting the conclusions and recommendations of the Symposium was also published.

As background information for this Symposium, IFIP financed a study on marketing on the Tanzanian side of Lake Victoria; "A review of the main characteristics of long distance fish trade from Lake Victoria, Tanzania", by T.W. Maembe, Deputy Director of the Department of Fisheries. This study focussed on describing major product flows, prices, marketing systems and practices. Development prospects and constraints are issued in relation to major fish products from the lake.

IFIP also sponsored the two following contributions: "Harvesting: socio-economic aspects of the Tilapia, Nile perch and pelagic fisheries (*Rastrineobola*)" by J.S. Mbuga (Fisheries Department, Kenya), and; "Marketing and distribution aspects of Lake Victoria fisheries in Uganda" by C.T. Kirema-Mukasa (Fisheries Department, Uganda).

## 2.3 LAKE VICTORIA STATISTICS WORKSHOP

At its fifth session in Mwanza, Tanzania, in October 1989, the CIFA Sub-Committee recommended that the IFIP Project in collaboration with national projects dealing with fishery statistics, organize a workshop on the statistics of the lake to enable the exchange of statistical information among researchers, scientists, statisticians and administrators of the Riparian States of Lake Victoria.

The Lake Victoria Fisheries Statistics Workshop was held at Kampala, Uganda from 26 to 29 June 1990. It was sponsored by the IFIP project with the support was of the FAO/UNDP Project "Fisheries Statistics and Information Systems" based in Entebbe, and of the FAO/UNDP Project "Strengthening of the statistical Unit" based in Dar-es-Salaam. The workshop was attended by 19 participants from Kenya, Tanzania, Uganda and FAO.

In structuring the meeting, it was decided to focus on the following broad subjects : (i) Census; ii) Catch assessment survey; and iii) Socio-economic data. The main recommendations are given below:

#### Specific Recommendations

##### Census

It is recommended that each country undertakes a census at least once every three years. The censuses would be on the basis of complete enumeration and they would be updated yearly sample surveys.

It is further recommended that the minimum survey items be the following:

- i) landing sites;
- ii fishermen;
- iii) fishing craft by type; and
- iv) gear by type.

##### Catch Assessment Survey

It was strongly recommended that increased support be given by both donor agencies and national governments to the respective fisheries statistical units in order that catch assessment surveys (CAS) may be developed on a sustained basis.

Each country should produce a summary of its Lake Victoria CAS results on a yearly basis according to the format developed by this workshop (see CAS group report). These summaries could be discussed during the proposed annual statistical fora and finalised before publication.

Regular meetings between national Fisheries Departments and Research Institutes should be encouraged to review and compare parallel catch data and the methods employed for their collection.

##### Socio-Economic Surveys

Some revision was recommended for the categories of enumeration employed in the national monitoring systems, so that :

- (i) traffic in fish carried by transport boats may be more reliably assessed; and

- (ii) numbers and gender of fish processors and traders operating at landing and market sites may be measured.

It was recommended that efforts need to be made forthwith to standardise visiting schedules and sampling procedures with regard to the enumeration of trading activity at minor markets, as current practices are very unsystematic.

It was proposed that periodic major sample surveys covering socio-economic dimensions of the fishing industry be undertaken in each country, at intervals of from three to five years.

It was recommended that periodic surveys should entail investigation of such critical areas as infrastructural features and amenities at landing sites and marketplaces, the organisation and profitability of fishing and trading enterprises, and patterns of consumer behaviour.

#### General Recommendations

It was recommended that training should be arranged for :

- (a) Statisticians and planners in advanced statistical methods, computerised processing of data and dissemination of results;
- (b) Supervisors and field enumerators for proper identification of survey items, development of enumeration skill and usefulness of field data at national level.

In order for survey work to be efficiently undertaken, it was recommended that facilities by way of transport, data processing, and field equipment should be procured according to specifications suggested by this workshop.

To overcome financial and staffing constraints it was recommended that National Governments be requested to look into ways of increasing the budget allocations to statistical units.

It was recommended that regional co-operation be encouraged. This may be accomplished through various avenues, including the regional Lake Victoria Fisheries Research Project, the CIFA Sub-Committee for Lake Victoria and the UNDP/FAO Regional Fisheries Project based in Burundi. These agencies should, in particular, facilitate the attendance at regional and international symposia, meetings and workshops by fisheries statistics personnel and planners.

For the sake of better regional co-operation it was, further recommended that a Regional Coordinator be designated to serve in each national statistical unit. It is proposed that the three Regional Coordinators should meet at least once every year between July and December to review, discuss and compile annual statistical summaries for the entire lake.

#### Follow-up activity

As a follow up of the Regional Workshop on fisheries statistics organized by IFIP in 1990, the creation of a regional network has been proposed. Uganda, as host of this workshop, is to take the lead in organizing such network which will allow for regular consultation among the three

countries and for jointly addressing at technical level any issues related to statistical monitoring, harmonization, joint analysis of key data and the exchange of information. The Department of Fisheries of Uganda has agreed to take the lead for this network and will convene a first meeting later on this year with IFIP support.

#### 2.4 MANAGEMENT SEMINARS FOR THE RIPARIAN STATES OF LAKE VICTORIA

The Fifth Session of the FAO CIFA Sub-Committee for the Development and Management of the Fisheries of Lake Victoria, held from 12 to 14 September 1989 at Mwanza, noted tremendous changes in Lake Victoria fisheries. It was, therefore, recommended that national seminars be organized to discuss management issues, options and strategies for the Riparian States.

Accordingly IFIP organized a national seminar for Kenya from 22 to 24 July 1991 at Kisumu; a national seminar for Uganda at Jinja from 6 to 8 August 1991; and a national seminar for Tanzania at Mwanza from 15 to 17 October 1991. The three reports on these national seminars have already appeared in separate IFIP technical document issues.

The main conclusions and recommendations of the three seminars are summarized below.

##### 2.4.1 SUMMARY OF MAIN CONCLUSIONS AND RECOMMENDATIONS FOR THE KENYAN SEMINAR

###### (i) Fisheries statistics

Considering the inadequate data on fishing boats, engines, gear and fishermen, the National Seminar recommended the following:

- Review of the system of data collection and methodology for estimating total landing; and
- Collaboration, harmonization and close supervision of data collection by the Fisheries Department and KMFRI.

###### (ii) Status of stocks

Considering that the magnitudes of standing stocks of exploited species are unknown, it was recommended that a vigorous stock assessment survey programme be mounted to establish the biomass of Nile perch, dagaa/Omena, Nile tilapia and other species including the shrimp Caridina nilotica.

###### (iii) Regulating fishing activities

###### Gillnets :

It was recommended that the mesh size restriction of 88.9 - 127 mm gillnets targeted to tilapias be enforced. It was also recommended that for the Nile perch fishery, gillnets must have a mesh size greater than 127 mm.

###### Beach Seines :

Recognising the destructive effect of beach seines to spawning stocks, juveniles and breeding grounds (leading to poor recruitment), a total ban on beach seining was strongly recommended.



'Omena' Seines :

The National Seminar recommended that 10 mm mesh size nets be used provided that these nets are targeted at R. argentea and that they are operated at not less than two hundred meters from the nearest shoreline.

Trawling

Considering the incompatibility of trawling with gillnet fisheries, a total ban on trawling in kenyan waters of Lake Victoria was recommended.

Traps :

The participants recommended a total ban on the use of traps in rivers and rivers mouths.

(iv) Envisaged new fisheries

The National Seminar recommended the introduction of a new selective fishing method for exploiting the pelagic Rastrineobola (Omena) with lift-net by catamaran in offshore waters.

(v) Fisheries legislation/restrictions

Noting that the present Fisheries Legislation and Restrictions are adequate, it was agreed that these provisions be implemented, enforced and regularly reviewed.

Closed Areas :

It was noted that the principle of closed area is applicable in some areas of Lake Victoria. It was therefore recommended that these areas be identified, specified and gazetted.

Closed Season :

The Working Group noted that good legal provisions exist for protecting the principle of closed season for catadromous fish species. It was, therefore, recommended that these provisions be strictly enforced.

(vi) Mechanisms and channels of communication

In full agreement that there is no institutional interaction among researchers, fishermen and policy makers, it was strongly recommended that the institutions concerned (Fisheries Department, KMFRI, LBDA and Universities) take immediate initiatives to collaborate and ensure continuous and effective interaction among them.

(vii) Infrastructure and servicesVillage Fishing Facilities :

In view of inadequate infrastructure and facilities in fishing villages, it was strongly recommended that the required social amenities be provided to fishing communities.

Fishermen Cooperatives :

Noting that the organization and management of fishermen cooperatives are inadequate, the participants recommended urgent restructuring and strengthening of cooperatives with a view making them more efficient in dispensing services.

(viii) Environmental protectionPollution :

In view of pollution potential around Lake Victoria, it was recommended that KMFRI continue monitoring pollution levels in the lake and inflowing rivers as well as presence of pollutants in fish. This should be done in collaboration with other environmental protections agencies.

For the purposes of effective monitoring of pollutants, it was also recommended that an inventory of pollution sources be compiled and that the established safe levels of water quality be adhered to. In effect, there should be a strong public education in environmental protection.

Mbita Causeway :

In view of the general concern about the ecological effect of the Mbita Causeway on the ecosystem of the Gulf, the National Seminar recommended the collection of ecological data to assess and determine its effects to the ecosystem, which might necessitate its demolition and the subsequent construction of an appropriate bridge.

(ix) Budgetary provisions

Noting that the annual budgetary allocation to KMFRI, the Fisheries Department and LBDA are inadequate, the Working Group recommended that the Government makes significant financial increases to these institutions mainly involved with the day-to-day management of the productive fishery sector.

**2.4.2 SUMMARY OF MAIN CONCLUSIONS AND RECOMMENDATIONS FOR THE UGANDAN SEMINAR**(i) Fisheries statistics

Recognizing that the Fisheries statistics are still inadequate and Aware that the Fisheries Department is developing a system to maintain consistent statistical data collection, it was recommended that the statistical methodology should be standardized and the scope widened to enable the required information to be extracted.

(ii) The status of the stocks

Realizing that commercial landings from Lake Victoria have increased due to increased landings of Lates, O. niloticus and R. argentea, but that landings of the other species has declined; and aware that there is currently high fishing pressure and heavy industrial investment in the fishery sector without clear knowledge of the magnitude of the stocks, it was recommended that (a) stock assessment be carried out to define the magnitude of the stocks both inshore and offshore; (b) the building of more fish processing plants be halted until the magnitude of the stocks has been defined; (c) and that the

production of existing plants be monitored so that they do not expand their existing capacity; and (d) the quality of the fish products from the existing plants must be strictly controlled to meet established international standards.

(iii) Regulating fishing activities

Realising the damage caused by small mesh size gillnets to the major fishes of commercial importance (viz. Lates and Oreochromis) it was recommended that small gillnets (less than 5 inches or 127 mm) should be banned.

Realising the economic importance of Lates and Oreochromis and the need to protect the fishery it was recommended that the minimum size of fish permitted by law should be specified as 11 inches (280 mm), 20 inches (500 mm) for Oreochromis niloticus and Lates respectively.

Beach Seines

In view of the destructive nature of beach seines, for example in destroying breeding and nursery grounds it was recommended that their use should be prohibited. It was further recommended that researchers should analyze the data obtained from the Fisheries Department and report later.

Small-sized Seines

Aware of the destructive nature of seines the use of small-sized seines should not be permitted. It was agreed that exploitation of Rastrineobola should be more selective and that the use of lift nets should be promoted.

Cast Nets

Realising that cast nets destroy Oreochromis breeding grounds and rapidly deplete their brood stocks, it was recommended that their use be prohibited.

Small-scale Purse Seining

Small-scale purse seining methods such as "Tycoon" and "Sekeseke" should be gradually phased out and eventually prohibited but researchers should examine the destructive nature of the methods.

Trawling

Noting the existence of two pairs of trawlers conducting trawling operations on experimental basis and aware that the fishery of L. Victoria is dependent on the artisanal fisherfolk for its exploitation, realising that conflicting with artisanal fisherfolk would not be desirable the Working Group recommended that:

- experimental trawling could continue but should be restricted to offshore waters beyond specified distances from the land.
- commercial trawling should only be permitted after obtaining stock assessment results.

- in the event of allowing commercial trawling the number of trawlers should be determined according to the data from stock assessment.

#### Longlines

Regarding longlines it was noted that small sized hooks in practice catch immature Nile perch and Tilapia the economically important species the fishery of which should be protected. It was recommended that while the use of longlines particularly with large hooks should be allowed to continue studies should be carried out to determine the minimum size of hook to be determined by law.

#### Traps and Weirs

These were regarded as harmless in the open lake, but it was recommended that their use across rivers and river mouths be prohibited.

#### (iv) Envisaged new fisheries

It was recommended that the use of lift nets by catamaran should be encouraged particularly to exploit Rastrineobola. Those fishing for Rastrineobola should be encouraged to use light after getting permission from the relevant authorities. The minimum mesh size for the lift net should be 10 mm. It was further recommended that research should be conducted to establish the exact optimum mesh size for the purpose.

#### (v) Fishery legislation/restriction

It was noted that good provisions for fishery legislation generally existed and they were acceptable to fishermen. It was observed that:

- the system of closed areas is applicable; the areas could be identified and gazetted it would be necessary to facilitate restricting fishing in such areas.
- the system of closed seasons is not applicable.
- mesh size restrictions were necessary and enforceable.

#### (vi) Mechanism and channels of communication

Aware that interaction between the researcher, fisheries administrators and fishermen has been poor, it was recommended that, interaction between fisheries administrators, researchers and fishermen should be strengthened to initiate the dissemination and execution of research information. In view of this vacuum, it is suggested that a Fisheries Liaison Committee be set up consisting of fisheries administrators, researchers, processors and fishermen to plan for interaction within the fisheries sector. There should also be at least an annual meeting of All Fisheries Officers and Research Officers and the fish dealers.

#### Credit Schemes

Realizing that Credit schemes are very helpful in financing projects and Aware that co-operatives and commercial banks have assisted in providing

fishermen with fisheries inputs eg. nets, cords and outboard motors - but payments of the loans sometimes due to high interest rates have been poor and discouraged the recipient, it was recommended that an alternative method of organizing the fishermen into groups other than co-operatives should be sought and given legal status.

(vii) Environmental protection

Pollution

Realising that there are potential sources of pollutants from industrial effluents, agricultural pesticides, urban effluents and the invasion of the water hyacinth, it was recommended that (i) industrial complexes construct effluent treatment plants or else they should not be licensed, and those industries without treatment plants should be closed down; (ii) there is need to set up standards for acceptable levels of pollutants that can be discharged in water systems; (iii) Fisheries researchers should be allowed free access to factories to monitor effluents discharged and should be allowed to monitor chemicals or pollutants originating from chemical agricultural inputs.

Water Hyacinths Control

Water Hyacinths was observed to be spreading around the lake and this weed is a threat to the fisheries. It was proposed to use all acceptable available means; physical, chemical or biological to stop the spread of the weed. At a regional level, a single country's effort cannot succeed on its own. It was therefore recommended that the three Riparian states be involved in fighting this weed. Fishermen and other people affected by the spread of the weed should be encouraged to participate in the process of eradication. UFFRO, Fisheries Department & Environmental protection should form the co-ordinating body for this.

**2.4.3 SUMMARY OF MAIN CONCLUSIONS AND RECOMMENDATIONS FOR THE TANZANIA SEMINAR**

(i) Fisheries statistics and socio-economic data

Noting that the fishery statistics collecting system is inadequate, it was recommended that:

- (a) the fishery data collectors (beach recorders) should be placed under the authority of the Regional Fisheries Officers who should supervise their day to day activities.
- (b) the new statistics collection system developed by the FAO/UNDP Project be implemented as soon as possible.
- (c) Training of the data collectors (beach recorders) be done on field identification of fish species of commercial importance using the FAO field guide for freshwater species now under preparation.
- (d) The Fisheries Division should provide adequate funds, equipment and working facilities for the data collectors and supervisors.

It was noted that socio-economic data on distribution pattern and marketing channels are insufficient. It was recommended that periodic surveys

and studies be made to determine the distribution and marketing channels of fish and the contribution of the fishing industry to the economy of the country.

Noting that there is no adequate reliable information on the status of Nile perch, Oreochromis, Dagaa and other species, it was recommended to do the following:

- studies be carried out to assess the stock size, potential yield;
- the minimum mesh size for the gill net fishery for Nile perch be 5" and above (stretched) that is 127 mm.
- TAFIRI should conduct studies to determine the minimum mesh size for the Oreochromis gill net fishery.
- the minimum mesh size for the dagaa fishery should be 10 mm (stretched).

(ii) Regulating fishing activities

Gillnets

Concerning gillnet fisheries, the following measures were recommended:

- Nile Perch: the minimum mesh size for the gillnet fishery for Nile perch be 5" and above (stretched) that is 127 mm.
- Tilapiine: TAFIRI should conduct studies to determine the minimum mesh size for the Oreochromis gillnet fishery.
- Dagaa: The minimum mesh size for the dagaa should be 10 mm (stretched).

Mosquito Netting Material for Dagaa

Noting with concern that the use of mosquito seines in fishing for Dagaa is destructive, it was recommended that mosquito seines be banned in the waters of Lake Victoria.

Beach Seines

It was noted that beach seines were destructive and caught immature fish. Therefore, it was recommended that the use of beach seines be banned in the waters of Lake Victoria.

Trawling

It was noted that trawling is a useful method of fishing on Lake Victoria but can be destructive in shallow habitats. Hence, it was recommended that trawling should be limited to the offshore waters, not shallower than 20 metres.

Fishing gear for Clarias/Bagrus and Protopterus fisheries

It was recommended that Bagrus, Clarias and Protopterus be fishes with gill nets 127mm (5 inches) minimum mesh size as well as with longlines.

Purse seines

It was observed that purse seines are efficient and do not have adverse effect on bottom substrates. Purse seines were, however, not selective to species attracted by light. It was, therefore, recommended that the use of purse seines for the target Rastrineobola (dagaa) should be preceded by experimental fishing.

Mosquito netting material for Dagaa

Noting with concern that the use of mosquito seines in fishing for Dagaa is destructive, it was recommended that mosquito seines be banned in the waters of Lake Victoria.

(iii) Fisheries legislations/restrictions

Fish species introductions

Aware of the fact that the ecosystem of Lake Victoria has changed due to species introductions, it was recommended that no other fish species be introduced in Lake Victoria.

Closed areas

There was no objection to the restrictions on the 24 gazetted closed areas around the Tanzanian sector of Lake Victoria as well as a closed season for them extending from 1st January to 30th June.

(iv) Mechanisms and channels of communication

Linkages between researchers, policy makers and the fishermen

Noting that the present communication between the Fisheries Division, TAFIRI, the Universities, TAFICO and the fishermen is inadequate, it was recommended that:

- (a) there should be frequent exchanges of information in the form of meetings, reports and publications between the institutions mentioned above.
- (b) regular meetings be made between the Regional and District Fisheries Officers together with the Research and Training Institutions around Lake Victoria.

(v) Fishery infrastructures and services

Fishermen's cooperatives

Noting that the establishment of fishermen's cooperatives was desirable for giving fishermen a strong stand on their resolutions and access to credits

from the government and its financial institutions, it was recommended that fishermen cooperatives be established and strengthened.

#### Credit schemes

The working group on Development agreed that credit schemes could be feasible provided the fishermen were mobilized and well guided. It was therefore recommended that fishermen be enlightened in this aspect.

#### (vi) Environmental protection and pollution

##### Pollution Threats

It was recommended that effluents from industries near the lake should be treated by aeration and other means before being discharged into the lake to control pollution.

##### Siltation control

It was recommended that an agriculture free zone should be established near and around the lake and rivers mouth/banks particularly in papyrus fringed areas to minimize siltation.

##### The aquatic weed (Water Hyacinth)

Noting with concern the spread of the aquatic water weed (hyacinth) in the Tanzania waters of Lake Victoria, it was recommended that:

- (a) the authorities in the regions around the Lake Victoria should mobilise the fishermen to physically remove the weed from the lake.
- (b) The Universities and TAFIRI should carry out studies on the possible economic uses of the weed and disseminate the information to the policy makers and the public at large.

## 2.5 COORDINATED RESEARCH ON RASTRINEOBOLA ARGENTEA

### Creation of a working group on Rastrineobola argentea

Lake Victoria small pelagic Rastrineobola argentea plays a vital role within the lake's ecosystem and fisheries. It is one of the main prey species of Nile perch and the second most important commercial species, in terms of catch magnitude from the lake.

Research and management work on R. argentea was recommended and judged of the highest priority in the last CIFA Sub-committee for Lake Victoria (Mwanza, September 1989). On this basis, the IFIP Project has provided technical and financial support to organize an *ad hoc* Working Group on Rastrineobola. Members of the Working Group are fisheries biologists from Uganda (UFFRO), Kenya (KMFRI), Tanzania (TAFIRI) and a fisheries biologist from IFIP.

The First Working Group meeting on Rastrineobola was held in Kisumu, 9 - 11 December 1991 and hosted by KMFRI. The objectives of the meeting were:



- a) To have a broad overview concerning the whole lake of the present status of R. argentea, identifying possible gaps and needs in the assessment and management of this species on the basis of papers presented and discussed by the participants.
- b) To establish a common cooperative research programme on the biology and population dynamics of Rastrineobola, in order to acquire better knowledge of the resource and to establish proper management measures.

#### Support to joint research programme

A research programme, proposed by IFIP, for defining some basic population parameters of the stock was discussed and adopted. The research work has to be realized by the national biologists participating in the Working Group, and coordinated by the IFIP Project. Some limited financial support will be provided by IFIP for research work, organization and attendance to the subsequent meetings of the Working Group.

Data collection work is planned for a minimum period of 12 months. After the first 6 months, a workshop is envisaged, to be held at Jinja (Uganda). Three or four months after terminating research study, a seminar will be held to compare and discuss the result and to undertake further analysis of the data.

Every three months the collected data will be forwarded to the IFIP Project in Bujumbura for circulating to the institutions and fishery biologists involved in the research. Such system will facilitate the implementation of an effective and continuous flow of data and information among researchers and national institutions, strengthening regional cooperation capability on management of common resources.

This programme was to be initiated in March 1992. It was delayed first by lack of funds and may soon be started if the second phase of the project is confirmed.

#### **2.6 ORGANIZATION OF A REGIONAL MANAGEMENT SEMINAR**

A consultancy was undertaken by IFIP in February–April 1992 to assess key management issues and propose a management plan for the fisheries of Lake Victoria. The terms of reference of this consultancy were specified as follows:

The plan will have a regional and 3 national components. It will focus primarily on the 3 main fisheries and aim at achieving the sustainability of the resource base and of the socio-economic benefits derived from its exploitation by the industry and consumers.

Towards this end, the consultant will review the existing literature and the recent reports of the 3 national management workshops organized by IFIP. The recommendations made in this context will be assessed and prioritized.

On this basis the consultant will conduct a thorough analysis of requirements for implementing major recommendations. Management measures will be assessed in relation to MCS requirements and related constraints : legal, institutional, organizational, etc. The functions/responsibilities of the

institutions/administrations concerned and the possible involvement of fishermen representatives in fisheries management/MCS will be reviewed. Related needs for external assistance will be identified.

Finally, the consultant will assess the possibility of harmonizing management measures at the regional level, especially with respect to the regulation of fishery effort.

A report has been prepared on this basis by the consultant. This report is to serve as reference material for a regional workshop to be held in October 1992 in Dar es Salaam. This workshop will bring together high level decision makers from the three countries, as well as donors. This workshop will be organized to coincide with a meeting of the *ad hoc* Committee for the creation of a Lake Victoria Fisheries Commission.

LIST OF IFIP REPORTS - LISTE DES RAPPORTS PPECI. TECHNICAL DOCUMENTS / DOCUMENTS TECHNIQUES

- Gréboval D., A. Bonzon, M. Giudicelli and E. Chondoma, Baseline Survey  
1989 report (1987) on inland fisheries planning, development and  
management in Eastern/Central/Southern Africa. UNDP/FAO Regional  
Project for Inland Fisheries Planning (IFIP). RAF/87/099-TD/01/89  
(En): 104p.
- Gréboval D., A. Bonzon, M. Giudicelli et E. Chondoma, Rapport de l'étude de  
1989 base (1987) sur la planification, le développement et  
l'aménagement des pêches continentales en Afrique Orientale/  
Centrale/Australe. Projet Régional PNUD/FAO pour la Planification  
des Pêches Continentales (PPEC). RAF/87/099-TD/01/89 (Fr): 110p.
- Gréboval D., and B. Horemans (eds), Selected Papers presented at the  
1989 SADC/FAO Training Workshop on Fisheries Planning, Victoria  
Falls, Zimbabwe, 15-24 Novembre 1988. UNDP/FAO Regional Project  
for Inland Fisheries Planning (IFIP). RAF/87/099-TD/02/89 (En):  
138p.
- Horemans B., et Maes M. (éds), Rapport de la Consultation technique sur les  
1989 lacs Cohoha et Rweru partagés entre le Burundi et le Rwanda  
(Bujumbura, 13 et 14 Décembre 1989). Projet Régional PNUD/FAO  
pour la Planification des Pêches Continentales (PPEC).  
RAF/87/099-TD/03/89 (Fr): 94p.
- Gréboval D., Management of the New Fisheries of Lake Victoria: Major socio-  
1989 economic issues. UNDP/FAO Regional Project for Inland Fisheries  
Planning (IFIP), RAF/87/099-TD/04/89 (En): 25p.
- Gréboval D. (ed), Principles of fisheries management and legislation of  
1990 relevance to the Great Lakes of East Africa: Introduction and  
case studies. UNDP/FAO Regional Project for Inland Fisheries  
Planning (IFIP), RAF/87/099-TD/05/90 (En): 41p.
- Report of the IFIP/SWIOP Workshop on Economic Aspects of Fisheries  
1990 Development and Management. UNDP/FAO Regional Project for Inland  
Fisheries Planning (IFIP), RAF/87/099-TD/07/90 (En): 22p.
- Corsi F., Evaluation des pêcheries zairoises des lacs Idi Amin/Edouard et  
1990 Mobutu Sese Seko. Projet Régional PNUD/FAO pour la Planification  
des Pêches Continentales (PPEC). RAF/87/099-TD/08/90 (Fr): 64p.
- Corsi F., Evaluation of the Zairian Fisheries of Lakes Edward and Mobutu.  
1990 UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP),  
RAF/87/099-TD/08/90 (En): 60p .

- Rapport de la première réunion du Comité consultatif du projet régional  
1990 pour la planification des pêches continentales. Projet Régional  
PNUD/FAO pour la Planification des Pêches Continentales (PPEC).  
RAF/87/099-TD/09/90 (Fr): 24p.
- Report of the First Meeting of the Advisory Committee of the Regional  
1990 Project for Inland Fisheries Planning. UNDP/FAO Regional Project  
for Inland Fisheries Planning (IFIP), RAF/87/099-TD/09/90 (En):  
22p.
- Report of the Symposium on Socio-economic aspects of Lake Victoria  
1990 Fisheries. A Symposium organized by the IFIP Project under the  
framework of the CIFA Sub-committee for Lake Victoria, 24-27  
April, Kisumu, Kenya, UNDP/FAO Regional Project for Inland  
Fisheries Planning (IFIP), RAF/87/099-TD/10/90 (En): 24p.
- Maes M. (ed), Report on the Technical Consultation on Lake Mweru shared by  
1990 Zaire and Zambia, 08-10 August, Lusaka, Zambia, UNDP/FAO Regional  
Project for Inland Fisheries Planning (IFIP), RAF/87/099-TD/11/90  
(En): 44p.
- Maes M. (éd), Rapport de la Consultation technique sur le lac Mweru partagé  
1990 entre le Zaïre et la Zambie, 08-10 août, Lusaka, Zambie, Projet  
Régional PNUD/FAO pour la Planification des Pêches Continentales  
(PPEC). RAF/87/099-TD/11/90 (Fr): 45p.
- Papers presented at the IFIP/SWIOP Workshop on Economic Aspects of  
1990 Fisheries Development and Management. UNDP/FAO Regional Project  
for Inland Fisheries Planning (IFIP), RAF/87/099-TD/12/90 (En):  
122p.
- Case studies presented at the IFIP/SWIOP Workshop on Economic Aspects of  
1990 Fisheries Development and Management. UNDP/FAO Regional Project  
for Inland Fisheries Planning (IFIP), RAF/87/099-TD/13/90 (En):  
115p.
- Ssentongo G.W. (ed), Report of the First Workshop on Fisheries Statistics and  
1990 Information Systems for Lake Victoria. UNDP/FAO Regional Project  
for Inland Fisheries Planning (IFIP), RAF/87/099-TD/14/90 (En):  
72p.
- Rapport de la consultation Technique sur l'aménagement des pêcheries des  
1990 lacs Edouard et Mobutu, 17-21 septembre 1990, Kampala, Ouganda,  
Projet Régional PNUD/FAO pour la Planification des Pêches  
Contininentales (PPEC). RAF/87/099-TD/15/90 (Fr): 30p.
- Report of Technical Consultation on Management of the Fisheries of Lakes  
1990 Edward and Mobutu, 17-21 September 1990, Kampala, Uganda,  
UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP),  
RAF/87/099-TD/15/90 (En): 26p.
- Report of the National Workshop on Fishery Statistics and Information  
1990 Systems, 22-26 October 1990, Addis Ababa, Ethiopia, UNDP/FAO  
Regional Project for Inland Fisheries Planning (IFIP),  
RAF/87/099-TD/16/90 (En): 33p.

- Machena C. and V. Kanondo, A Review of the Fisheries of Lake Kariba and their Management. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP). RAF/87/099-TD/17/91 (En): 58p.
- Rapport de la deuxième réunion du Comité consultatif du projet régional pour la planification des pêches continentales. Projet Régional PNUD/FAO pour la Planification des Pêches Continentales (PPEC). RAF/87/099-TD/18/91 (Fr): 25p.
- Report of the Second Meeting of the Advisory Committee of the Regional Project for Inland Fisheries Planning. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP). RAF/87/099-TD/18/91 (En): 23p.
- Prado J., Beare R.J., Siwo Mbuga J., Oluka L.E. A catalogue of fishing methods and gear used in Lake Victoria. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP). RAF/87/099-TD/19/91 (En): 104p.
- Biribonwoha A.R. A Review of Fisheries Inputs in Kenya, Tanzania and Uganda. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP). RAF/87/099-TD/20/91 (En): 65p.
- Rapport de la deuxième Consultation technique sur l'aménagement des pêcheries des lacs Edouard et Mobutu Sese Seko. Projet Régional PNUD/FAO pour la Planification des Pêches Continentales (PPEC). RAF/87/099-TD/21/91 (Fr): 27p.
- Report of the Second Technical Consultation on the Management of the Fisheries of lakes Edward and Mobutu, 27-29 May 1991, Kinshasa, Zaire. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP). RAF/87/099-TD/21/91 (En): 28p.
- Leendertse K. and B. Horemans. Socio Economic Characteristics of the Artisanal Fishery in Kigoma region, Tanzania. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-TD/22/91 (En): 104p.
- Hanek G, K. Leendertse and B. Farhani. Socio-Economic Investigations of Lake Kivu Fisheries. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-TD/23/91 (En): 55p.
- Report on the Regional Training Course on Fish Stock Assessment, 21 January - 15 February 1991, Kariba, Zimbabwe. Denmark funds-in-trust FI: GCP/INT/392/DEN-Act. Rep. No 29 and UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-TD/24/91 (En): 29p.
- Bellemans M., Structural characteristics of the Burundi Fisheries in 1990 and Historical Review. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-TD/25/91 (En): 26p.
- Hoekstra T.M., A. Asila, C. Rabuor, O. Rambiri. Report on the census of fishing boats and gear in the Kenyan waters of Lake Victoria. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-TD/26/91 (En): 36p.

- Ssentongo G.W. and J.D. Nfamara. Report of a National Seminar on the  
1991 Development and Management of the Kenyan Fisheries of Lake  
Victoria. UNDP/FAO Regional Project for Inland Fisheries Planning  
(IFIP), RAF/87/099-TD/27/91 (En): 124p.
- Reynolds J.E., P. Mannini and D. F. Gréboval. Obscure Waters: The Fisheries  
1991 of the Mweru/Luapula Complex, Zambia - Report of an IFIP Review  
Mission. UNDP/FAO Regional Project for Inland Fisheries Planning  
(IFIP), RAF/87/099-TD/28/91 (En): 87p.
- Maes M., G. Ntakimazi et J. Ruremesha. Situation générale des lacs Cohoha  
1991 et Rweru et propositions d'aménagement. Projet Régional PNUD/FAO  
pour la Planification des Pêches Continentales (PPEC).  
RAF/87/099-TD/29/91 (Fr): 61p.
- Rapport de la deuxième Consultation technique portant sur l'aménagement des  
1991 pêcheries des lacs Cohoha et Rweru. Projet Régional PNUD/FAO  
pour la Planification des Pêches Continentales (PPEC).  
RAF/87/099-TD/30/91 (Fr): 47p.
- Ssentongo G.W. and F.L. Orach-Meza (eds.), Report of a National Seminar on  
1992 the Development and Management of Ugandan fisheries of Lake  
Victoria. UNDP/FAO Regional Project for Inland Fisheries Planning  
(IFIP). RAF/87/099-TD/31/92 (En): 137p.
- Gréboval D. et M. Maes, Caractéristiques et évolution des pêcheries des  
1991 lacs partagés d'Afrique centrale. Projet Régional PNUD/FAO pour  
la Planification des Pêches Continentales (PPEC). RAF/87/099-  
TD/32/91 (Fr) : 35p.
- Ssentongo G.W. and N. Dampha (eds), Report of the Technical Consultation  
1992 between Malawi and Mozambique on Lakes Malawi, Chilwa and Chiuta.  
UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP).  
RAF/87/099-TD/33/92 (En): 89p.
- Leendertse K. et M. Bellemans, Caractéristiques socio-économiques des  
1991 patrons de pêche artisanale et coutumière dans la partie  
burundaise du lac Tanganyika. Projet Régional PNUD/FAO pour la  
planification des pêches continentales (PPEC). RAF/87/099-  
TD/34/91 (Fr): 87p.
- Ssentongo G.W. (ed.), Report on the National Seminar on the Development and  
1992 Management of the Tanzanian Fisheries of Lake Victoria. UNDP/FAO  
Regional Project for Inland Fisheries Planning (IFIP),  
RAF/87/099-TD/35/92 (En): 86p.
- Horemans B. and M. Hoekstra, Economic appraisal of the pelagic fishery of  
1992 Lake Kariba. UNDP/FAO Regional Project for Inland Fisheries  
Planning (IFIP), RAF/87/099-TD/36/92 (En): 37p.
- Leendertse, K et Mambona Wa Bazolana, Caractéristiques socio-économiques de  
1992 la pêche zairoise de la partie nord du lac Tanganyika. Projet  
régional PNUD/FAO pour la planification des pêches continentales  
(PPEC). RAF/87/099-TD/37/92 (Fr): 76p.

Mannini P. (ed.), The Lake Victoria Dagaa (Rastrineobola argentea). Report of 1992 the First Meeting of the Working Group on Lake Victoria Rastrineobola argentea, 9-11 December 1991, Kisumu, Kenya. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-TD/38/92 (En): 84p.

Hoekstra T.M., The Artisanal Capture Fisheries of Lake Victoria, Kenya: major 1992 socioeconomic characteristics of its fishermen and their fishing units. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-TD/39/92 (En): 78p.

Horemans B., Analyse économique des pêcheries burundaises du lac Tanganyika. 1992 Projet régional PNUD/FAO pour la planification des pêches continentales (PPEC). RAF/87/099-TD/40/92: 69p.

Hoekstra T.M., The artisanal Capture Fisheries of Lake Tanganyika, Zambia: 1992 major socioeconomic characteristics of its fishermen and their fishing units. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-TD/41/92 (En): in preparation

\*\*\*\*\*Bukoba Census. UNDP/FAO Regional Project for Inland Fisheries 1992 Planning (IFIP), RAF/87/099-TD/42/92 (En): in preparation

Horemans B., Report of the Sub-regional Workshop on Fishery Bio-Economic 1992 Modelling, 17-21 February 1992, Kariba, Zimbabwe. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-TD/43/92 (En): in preparation

## II. WORKING PAPERS / DOCUMENTS DE TRAVAIL

Bean C.E., Selected abstracts of basic references and current literature in 1989 fisheries economics. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-WP/01/89 (En): 51p.

Ssentongo G. W., Fish and fisheries of shared lakes of Eastern/Central/ 1990 Southern Africa. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-WP/02/90 (En): 19p.

Nfamara J.D., Recent observations on the fisheries of lake Tanganyika. UNDP 1990 /FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-WP/03/90 (En): 16p.

Proceedings of the Symposium on Socio-economic aspects of Lake Victoria 1990 Fisheries. Volume 1 (unedited papers 1-7). UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-WP/05/90 (En): 114p.

Nfamara J.D., Improved method for smoking fish in the Kigoma region of Lake 1990 Tanganyika, Tanzania. UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP), RAF/87/099-WP/06/90 (En): 23p.

- Proceedings of the Symposium on Socio-economic aspects of Lake Victoria  
1991 Fisheries. Volume 2 (unedited papers 8-12). UNDP/FAO Regional  
Project for Inland Fisheries Planning (IFIP), RAF/87/099-WP/07/91  
(En): 88p.
- Gréboval D. et Diquelou J., Expérimentation de la senne tournante  
1991 et coulissante dans les eaux burundaises du lac Tanganyika: Etude  
de pré-faisabilité. Projet Régional PNUD/FAO pour la  
Planification des Pêches Continentales (PPEC). RAF/87/099-  
WP/08/91 (Fr): 20p.
- Maes M., Leendertse K. et Mambona Wa Bazolana, Recensement des unités de  
1991 pêche zaïroise dans la partie nord du lac Tanganyika. Projet  
Régional PNUD/FAO pour la Planification des Pêches Continentales  
(PPEC). RAF/87/099-WP/09/91 (Fr): 61p.
- Maes M. (ed.), Recueil de documents présentés à la Consultation technique  
1991 des lacs Edouard et Mobutu partagés entre le Zaïre et l'Ouganda.  
Projet Régional PNUD/FAO pour la Planification des Pêches  
Contininentales (PPEC). RAF/87/099-WP/10/91 (Fr): 112p.
- Nfamara, D., Introduction du Fumoir de type "Chorkor" au Burundi. Projet  
1992 Régional PNUD/FAO pour la Planification des Pêches Continentales  
(PPEC). RAF/87/099-WP/11/92 (Fr): 25p.
- Nfamara D., Fish processing in the Kagera Region of Lake Victoria: a review.  
1992 UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP).  
RAF/87/099-WP/12/92 (En): 32p.
- Pearce M.J., The Results of a Survey of the Fisheries of the Zambian waters  
1992 of Lake Tanganyika. UNDP/FAO Regional Project for Inland  
Fisheries Planning (IFIP). RAF/87/099-WP/13/92 (En): 44p.
- Mughanda M., Etat actuel de l'exploitation des pêcheries zaïroises du lac  
1992 Edouard/Idi Amin : vers la destruction des populations  
piscicoles. Projet Régional PNUD/FAO pour la Planification de  
Pêches Continentales (PPEC). RAF/87/099-WP/14/92 (Fr): 36p.
- Gréboval D., 'The fisheries of Lake Victoria : summary of IFIP Programme'.  
1992 UNDP/FAO Regional Project for Inland Fisheries Planning (IFIP),  
RAF/87/099-WP/15/92 (En): 24p.





