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LAKE TANGANYIKA FFMP IMPLEMENTATION PROGRAMME AND COMPONENT PROJECT PROFILES

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PREFACE

The Research for the Management of the Fisheries on Lake Tanganyika project (LTR) became fully operational in January 1992. It is executed by the Food and Agriculture Organization of the United Nations (FAO) and funded by the Finnish International Development Agency (FINNIDA) and the Arab Gulf Program for the United Nations Development Organization (AGFUND).

LTR's objective is the determination of the biological basis for fish production on Lake Tanganyika, in order to permit the formulation of a coherent lake-wide fisheries management policy for the four riparian States (Burundi, Democratic Republic of Congo, Tanzania, and Zambia).

Particular attention is given to the reinforcement of the skills and physical facilities of the fisheries research units in all four beneficiary countries as well as to the build-up of effective co-ordination mechanisms to ensure full collaboration between the Governments concerned.

The present report is the last in the series of Technical Documents published by the LTR Project. Its preparation was made possible through support provided by FISHCODE (GCP/INT/648/NOR -- Interregional Programme of Assistance to Developing Countries for the Implementation of the Code of Conduct for Responsible Fisheries). LTR gratefully acknowledges this support and particularly wishes to thank the FISHCODE Project Manager, Mr. Siebren Venema, for his sound advice and kind encouragement.

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A. BACKGROUND TO OVERALL PROGRAMME[1]

1. Lake Tanganyika, bounded by the countries of Burundi, Democratic Republic of Congo, Tanzania, and Zambia, hosts one of the largest inland fisheries in Africa. Its production volume is second only to that of Lake Victoria. Tanganyika therefore represents a significant source of food and livelihood for millions of people dwelling within and around its basin. The lake and its environs support a wide array of subsistence and commercial activity as well as a remarkable assemblage of tropical flora and fauna, including highly diverse populations of endemic fish, all within a setting of striking scenic appeal. The conservation value of the lake is thus also of enormous importance.

2. Amidst growing concerns over the environmental status, endangered biodiversity, and possible over-fishing of this unique lake, efforts have been mounted since 1992 through the FAO-executed Lake Tanganyika Research (LTR) Project (GCP/RAF/271/FIN), to investigate Tanganyika's biological production and fisheries potential. The overall project objective is to devise modalities for the optimal management, on a regional scale, of the lake's fisheries resources to serve present and future human welfare and biological conservation needs (FAO 1992).

3. In late 1997, with the basic research activities of the project largely complete, the LTR Fisheries Management Working Group was formed. It brought together a team of project advisors and associates from the respective national counterpart agencies of the four lacustrine countries as well as the University of Kuopio in Finland, and FAO technical officers from the Fisheries Department (FI) and the Development Law Service (LEGN).

4. The group was established in order to facilitate the process of collating and assessing major results of six years of LTR research on the size and structure of Lake Tanganyika's resources and the state of their exploitation (hydrodynamics, limnology, fish and zooplankton biology, remote sensing, fish genetics, and fisheries statistics), as well as the socio-economic dimensions and legal-institutional aspects of its fishery.

5. Consistent with overall LTR Project objectives, the resulting synthesis was used as a comprehensive set of reference points for developing a regional, lake-wide approach to the optimal management of Tanganyika's fishery resources.

[1] For more detailed treatment of the information summarised in this and the following sections, see Cacaud (1996, 1999a, 1999b), Maembe (1996), Reynolds & Hanek (1997), Reynolds (1998. 1999a, 1999b), Reynolds *et al*. (1999), Mölsä *et al.* (1999), and Hanek & Kapetsky (1999).

6. The first outcome of the Group's efforts was presented in a report entitled 'Regional Framework Planning for Lake Tanganyika Fisheries Management,' an early draft of which was presented to and discussed by delegates to the Sixth Meeting of the LTR Co-ordination Committee held in Lusaka, Zambia, in June 1998.

7. In addition to giving their broad endorsement to proposals outlined in the draft framework document, which is based on principles laid out in the FAO *Code of Conduct for Responsible Fisheries*, or CCRF (FAO 1995, 1996a, 1996b, 1997), delegates further agreed to a series of supportive or accompanying measures in order to facilitate management planning co-ordination and implementation between the four lacustrine States.

8. One such measure proposed by the Working Group was the organisation and conduct, later in 1998, of a lake-wide 'Community Referenda' exercise intended to:

a) inform lakeshore community residents on the outcomes of major LTR studies;
b) demonstrate how these outcomes led to the formulation of the provisional regional management framework; and, simultaneously,
c) in keeping with CCRF guidelines, obtain feedback and inputs from local groups in order to strengthen the regional framework.

1. LTR personnel successfully carried out the referenda exercise in October 1998, in collaboration with national field teams in each of the four States (Reynolds 1999a).

2. Additional recommendations of the Sixth LTR Co-ordination Committee Meeting called for complementary actions to be taken with respect to further assessment of legal and institutional provisions necessary to facilitate regional management planning and co-ordination, and preparation of a detailed workplan for extension of LTR's fisheries monitoring activities as a programme to be implemented in future under national execution.

3. The LTR Fisheries Management Working Group was further requested to elaborate the FFMP into a complete draft for presentation at the Eighth Session of the CIFA Sub-Committee for Lake Tanganyika scheduled for May 1999 and to explore and propose additional measures that would facilitate implementation of the FFMP.

4. Preparation of a work plan for the new Monitoring Programme, including budget details, equipment and material requirements, field team Terms of Reference, data collection and reporting protocols, and administrative/financial procedures was completed in late 1998, on the basis of a field mission to each of LTR's lakeside sub-stations in order to assess staff capabilities and equipment needs (Mannini 1999).

5. With timely assistance from the FISHCODE Project (GCP/INT/648/NOR -- Interregional Programme of Assistance to Developing Countries for the Implementation of the Code of Conduct for Responsible Fisheries.), further work was conducted on legal and institutional issues (Cacaud 1999a, 1999b). Beginning in early 1999, a detailed review and appraisal of existing fisheries legislation and monitoring, control, and surveillance (MCS) capacities within the four lacustrine States was mounted. Possible legal and institutional modalities in support

of regional harmonisation of fishery resource management were explored, and a set of recommendations for actions to facilitate implementation of the proposed FFMP was prepared.

6. Results of the Monitoring Programme planning work, the legal-institutional appraisals, and the Community Referenda exercise were taken in account as the proposed FFMP was finalised during FISHCODE/LTR technical consultations held at FAO headquarters in Rome in late March 1999.

7. The updated FFMP proposal and associated reports were presented to the Eighth Session of the CIFA Sub-Committee for Lake Tanganyika held 18-21 May 1999 in Lusaka.

8. The CIFA Sub-Committee adopted the FFMP as presented, and further requested the LTR Project to explore ways and means of implementing its provisions as soon as possible.

9. This document outlines the proposed FFMP Implementation Programme subsequently prepared by members of the LTR Fisheries Management Working Group. Justification for the programme, including a summary of problems to be addressed, FFMP main elements, and expected outcomes, are presented in Section B.

10. Section C introduces proposed implementation measures as a set of five component projects. Such an approach is in general accordance with the structure of the FAO Interregional Programme of Assistance to Developing Countries for the Implementation of the Code of Conduct for Responsible Fisheries (FAO 1996c) and its series of Sub-programmes.

11. The five component projects are respectively profiled in Annexes A through E.

B. JUSTIFICATION FOR THE OVERALL FFMP IMPLEMENTATION PROGRAMME

B.1 Problems to be Addressed; The Present Situation

Scale and regional significance of the Tanganyika fisheries

1. Based on data collected during recent aerial and parallel ground surveys, Lake Tanganyika presently hosts 44,960 active fishers, 18,240 operational fishing craft, and 786 landing sites (Table 1). An estimated 55-60% of active fishers are engaged in artisanal operations, involving the use of light attraction in association with lift nets and beach seines. The remainder are engaged in the traditional fishery, involving the use of gillnets, scoop nets, and longlines.

2. Such figures immediately direct attention to the important socio-economic role played by the fisheries. The tens of thousands of boat and equipment owners/operators and crew active in the harvest sector represent a first tier of fisheries employment and income generation. Secondary fisheries-generated employment has also to be taken into account. Local processors and traders, long-distant transporters and marketeers, and various others who

provide services and support at landing sites and throughout the distribution chains are reckoned to number in the hundreds of thousands.

3. If the individuals tied to the families and households of all of these operators and service providers are considered as well, it can quite plausibly be estimated that some one million people living around Lake Tanganyika -- one-tenth of the estimated population of the entire lake basin -- are directly dependent on the fisheries for their livelihood.

Table 1. Number of fishing units by type on Lake Tanganyika in 1995

Active fishers	44.957
Landing sites	786
Vessels total	19.356
Vessels operational	18.243
- fishing vessels	13.192
- lamp carriers/ helpers	2.256
- transport boats	532
- motorised vessels	1.264
-fishing lamps	20.379
Traditional gear	
-lines	20.744
- gill nets	6.300
- lusenga (scoop nets)	316
- traps	13
Artisanal gear	
-liftnets	2.976
-beach seine (day)	1.143
-kapenta beach seine (night)	154
-apollo liftnets	128
-chiromila seines	16
Industrial gear	
-purse seiner units total	52
-purse seiner units operational	28
-Zambia	16
-Congo	6
-Tanzania	4
-Burundi	2

Fisheries and local livelihood

1. Recent LTR socio-economic survey findings indicate that local fishers: a) are almost exclusively men; b) generally fall within an age range of 18 – 50 years; c) tend to have low levels of formal education (lack a primary school certificate); d) often originate from places other than their current landing site bases; and e) generally engage in fishing as their principal job, though are commonly involved in subsistence or combined food crop/cash crop farming as secondary occupations.

2. Available information suggests that artisanal unit owners earn significantly more than their crew labourers do. No such disparity is evident in the traditional fishery. Average earnings within the artisanal sector (no earnings data available for DRC sample populations) are estimated to run well above per capita annual income for the working age population within the respective lacustrine countries. Traditional sector earnings typically run much lower, though are still comparable to regional working age population averages.

3. Women are well represented in the fisheries post-harvest sector around the lake, and even appear to constitute a majority of the small-scale processor/trader population in Zambia and parts of the DRC. Survey data indicate that post-harvest operators: a) are relatively younger as a group than the fisher population; c) have a low overall level of education, particularly amongst women; d) tend to originate from places other than their current landing site bases; and e) are usually involved in the fish processing or trading as a main occupation, though are typically engaged in secondary jobs either in some other fishing-related activity (e.g. gear owner) or in farming.

4. Post-harvest income levels appear to be generally lower than those of the harvest sector, and especially in comparison with levels found in the artisanal fishery. Based on survey data it is estimated that average annual income for women in some cases runs well below national working age population averages.

Distribution of catch and effort

5. Present-day fishing operations primarily exploit six endemic species, including the two schooling clupeid 'sardines,' *Limnothrissa miodon* and *Stolothrissa tanganicae,* together with their four predator species, all centropomids of the genus *Lates* -- viz.: *L. stappersii, L. angustifrons, L. mariae*, and *L. microlepis.*

6. Of the *Lates* species, the latter three are incidental to the catch: the lake's commercial fishery is essentially based on three pelagic species -- the two clupeids (ca. 65% by weight) and *L. stappersii* (ca. 30% by weight). Annual harvest levels in recent years have been estimated to vary in the range of 165,000 - 200,000 tonnes -- volumes that translate into annual earnings on the order of tens of millions of US dollars. The harvest is shared between the littoral States roughly in the order, if not exact proportion, of each State's share of the total lake area. Thus fishers in the DRC (45% of lake area) land about 50% of the annual pelagic catch, whilst those in Tanzania (41% of lake area) land about 31%, in Burundi (8% of lake area) about 21%, and in Zambia (6% of lake area) about 7%.

7. The northern and southern extremities of the lake are subject to the greatest fishing pressure per unit of fishing area. In the case of the far north end, this outcome can be attributed to the high concentration of lift net units; for the far south, it results from the combined effects of industrial purse seine and traditional unit operations. As for the greater expanse of the lake that lies in between, a decreasing effort gradient running from north to south is apparent.

8. In recent years artisanal units (mostly liftnets and beach seines) are contributing an increasingly proportion of total production at the expense of industrial purse seine units. The maximum yields within the artisanal sector in Burundi are 106 tonnes/yr for apollo ('super' liftnet) units, and 41 tonnes/yr for regular liftnet units. In Zambia they are 62-68 tonnes/yr for kapenta (beach) seine or chiromila (boat) seine, but only 10 ton/yr for liftnet units.

9. The drastic decline in industrial fishing in northern waters is reflected in the migration or retirement of many purse seine units. Of the 13 industrial units active in Burundi in 1992, only two were enumerated as active in the 1995 Frame Survey. The remainder have either been decommissioned or have been shifted to Zambia in the south of the lake. The DRC has witnessed a similar decline in purse seining operations based in Kalemie and Moba, though this probably owes more to political instability than to adverse fishing conditions. In Tanzania the industrial fishery never developed to the same extent as elsewhere, but here too purse seining has fallen off within the last decade.

Destructive fishing practices

10. Over the last 15 years or so there has been a seven-fold growth in purse seining effort in Zambian waters (from 3 to 23 active units since 1983), almost exclusively harvesting *Lates stappersii*, which now comprise 95% of the industrial catch. The development of the purse seine fishery from the 1950s soon resulted in a substantial reduction in the harvest of other *Lates* species, i.e. *L. mariae*, *L. microlepis*, and *L. angustifrons*, all of which seem to be particularly vulnerable to localised over-fishing. Today's simple composition of the pelagic stocks, with two clupeids and *L. stappersii*, is one very striking outcome of the selective pressures imposed by the mechanised large-scale fishery.

11. It is notable that *S. tanganicae* was the dominant target species of the purse seine fishery in the Zambian waters of the lake during the 1980s. Although the *S. tanganicae* decline coincides with the expansion of purse seining in Zambia, the stock in northern waters, at least until recently, seems to have withstood decades of high fishing pressure in fairly confined areas. This strongly suggests that environmental factors have played a role in hastening the southern stock's decline.

12. LTR survey results confirm a more uniform lakewide distribution of the *L. miodon* stock in comparison with that observed for *S. tanganicae*. Catch composition observations indicate that *L. miodon* contribute less to the lift net and purse seine harvests than do *S. tanganicae* and *L. stappersii*. At the same time, *L. miodon* dominates catches in the highly unselective beach seine (= kapenta seine) fishery that operates close inshore over shallow, sandy bottoms, particularly along the southernmost coastlines. Since juvenile *L. miodon* tend to be concentrated within the inshore areas beach seine hauls are mostly comprised of immature fish.

Post-harvest practices and problems

13. Poor infrastructure and natural barriers impose heavy constraints on fish processing and marketing possibilities. Steep escarpments restrict overland access to much of the shoreline. Roads link the principal towns like Kigoma, Kalemie, Moba, and Mpulungu with their hinterlands, but feeder routes between towns and their outlying areas are not effectively developed. Railway lines exist only at Kigoma, in Tanzania (with service to Tabora and Dar es Salaam), and at Kalemie, in the DRC, with connections (when operable) west and eventually to the southern Shaba mining districts. Furthermore, there are few facilities for

energy-intensive techniques of fish handling and processing, e.g. chilling, freezing, or canning. The best equipped plants are found in Mpulungu and on a more limited basis in Kalemie.

14. The bulk of fish landed at most sites must of necessity be processed in some fashion in order to extend its shelf life for marketing purposes. Simple sundrying on the beach or ground is easily managed under local conditions, requiring little input other than labour. It is by far the most common method of processing clupeids and *L. stappersii*, which constitute the greater bulk of the lakewide catch.

15. Reliable statistics are lacking on the volume of product flow along the various marketing channels that reach beyond the lake basin, though scores of thousands of tonnes are clearly involved. Major outlets for dried fish are long established and well known. In addition to the mining districts of Shaba Province in the DRC and the Zambian Copperbelt, supplies reach the Dar es Salaam market through the railway connection from Kigoma. North of the lake, Bukavu and Goma in the DRC and towns in Rwanda and further afield have in recent years become important market destinations as well.

16. Constraints on commerce imposed by geographical barriers and weak marketing structures have differing effects, depending on location. On the one hand, they limit the growth of fishing pressure and the risk of over-exploitation across wide stretches of the lake. On the other hand, however, they may encourage basin inhabitants, including refugees displaced by outbreaks of civil conflict, to migrate to the more easily accessible landing sites around the lakeshore. Fish is more readily available to consumers at these places, and they further offer the possibility of fishery-related employment. In such instances the effect is to magnify localised fishing pressure and the risk of over-exploitation.

B.2 FFMP: Main Elements

17. The FFMP adopted by the CIFA Sub-Committee addresses critical problems of the Tanganyika regional fisheries through action in a number of areas. Principal elements may be summarised as follows.

Adoption of CCRF Policy Matrix

18. First, in order to ensure that the four lacustrine States act with a common set of development objectives in mind, the CCRF should be implemented by their respective competent authorities as the policy matrix for the shared fisheries of Lake Tanganyika.

19. Such a broad management orientation would entail specific measures in favour of:

a) adaptive or interactive management practices that allow for adjustments in fishing pressure;
b) multi-disciplinary monitoring capability for measurement of continuity and change across a range of bio-physical and socio-economic parameters, as appropriate to the complexities of ecosystem – human system interactions;

c) partnerships with local stakeholder groups in management decision-making and in fashioning modalities of enforcement and compliance;
d) allocation of access and fishing rights at local community levels; and
e) use of integrated development strategies and coastal area management models in order to accommodate interplay and possible conflicts between fishing and non-fishing activities and to reduce pressure on the fishery resource base through economic diversification.

Partnership Arrangements and Local Control of Resource Access

1. Co-management (community-based management, participatory management, partnership management) structures and operational arrangements should be encouraged around the lakeshore.

2. Community outreach activities with a strong environmental education component will be crucial for building local awareness and acceptance of responsibility in fisheries regulation decision-making and compliance assurance processes.

3. Licensing mechanisms in combination with allocation of use rights by zone or water territory between individual fishing communities and industrial interests would seem to be the most appropriate way of countering the 'race to fish.'

Institutional Modalities

4. Significant review and revision of existing institutional arrangements is warranted, particularly with respect to the following deficiencies:

a) inadequate budgetary allocation to fisheries sectors by central governments.
b) inadequate funding for research.
c) lack of human resources and equipment.
d) poor to non-existent enforcement of fisheries regulations.
e) insufficient linkage between central administration and field agents at local level.

1. Increased central government budgetary allocation to fisheries research and administrative agencies within the respective States should be complemented by increased involvement of local stakeholders in management decision-making and enforcement activities to improve overall management measure compliance and achieve greater cost efficiencies.

2. In order for the CIFA Sub-Committee for Lake Tanganyika to function more effectively as a mechanism to facilitate co-ordination of regional fisheries-related matters, its Terms of Reference need more explicitly to reflect, *inter alia*, such themes as:

a) coastal zone management, environment and water quality;
b) harmonisation of national measures for the sustainable utilisation of fisheries resources;
c) effects of non-indigenous species introductions;

d) periodic elaboration and implementation of a regional monitoring programme; and
e) encouragement of fisheries training and extension activities.

1. Accordingly, revised Terms of Reference for the Sub-Committee are proposed as shown in Table 2.[2]

Legal Modalities

2. Harmonisation of fisheries regulations is a key element of co-operation in the lake area that would greatly facilitate the implementation of a regional fisheries management plan. In particular, emphasis should be placed on three specific measures:

a) elaboration of a common classification of fishing units or categorisation of fishing operations;
b) development of mechanisms of management in partnership; and
c) improvement of enforcement of fisheries legislation.

Table 2. Revised TORs for CIFA Sub-Committee for Lake Tanganyika, as adopted at the Eighth Session of the Sub-Committee (Lusaka, Zambia, 18-21 May 1999)

The functions of the CIFA Sub-Committee for Lake Tanganyika include the following:

a) Facilitate discussions for all related fisheries matters, including coastal zone management, environment and water quality;
b) Promote the exchange and dissemination of fisheries information;
c) Develop and recommend conservation and management measures;
d) Facilitate periodic elaboration and implementation of a regional fisheries management plan and its components;
e) Harmonise national measures for the sustainable utilisation of the living resources of the Lake;
f) Advise on the direct or indirect effects of introduction of non-indigenous aquatic animals and plants into the waters of Lake Tanganyika and all the waters connected therewith consistent with the FAO Code of Conduct for Responsible Fisheries and the United Nations Convention on Biological Diversity and any other relevant international instruments;
g) Facilitate periodic elaboration and implementation of a regional monitoring programme and its components;
h) Facilitate the harmonisation of fisheries regulations for Lake Tanganyika;
i) Establish *ad hoc* subsidiary committees to perform such of its functions and subject to such conditions, as the CIFA Sub-Committee for Lake Tanganyika may determine;
j) Continue to explore ways and means of establishing an autonomous intergovernmental organization or arrangement;
k) Seek international financial assistance to support fisheries development and management programmes;
l) Facilitate, recommend and co-ordinate training and extension activities in all aspects of fisheries;
m) Report to CIFA at each session on its activities during the preceding inter-sessional period.

[2] Adopted as proposed at the Eighth Session of the Sub-Committee (Lusaka, Zambia, 18-21 May 1999).

Monitoring, Control and Surveillance (MCS)

1. The extended monitoring programme designed under LTR auspices should proceed according to the workplan already in place (Mannini 1999). In order to ensure its proper implementation, the following steps seem indicated.

a) periodic frame surveys, designed to assess the state of the fishing industry, should be required by fisheries legislation in each of the lacustrine countries;
b) ensure that consultation with fishers and other stakeholders takes place prior to revising old or devising new fisheries regulations in all four lacustrine States;
c) provide for participatory mechanisms in fisheries legislation where no such provision presently exists;
d) use of alternative enforcement schemes that favour close involvement of fishers and local communities in surveillance and control activities;
e) use of input supply and marketing networks to discourage availability of illegal gear and, conversely, encourage the availability of approved gear;
f) thorough review and revision of existing regime of sanctions provided for in fisheries legislation in consultation with local fishers and other stakeholders;
g) implementation of licensing ceilings for both industrial fishing units and lift net units accompanied by specific provisions encouraging the negotiation and conclusion of access agreements between lacustrine States, in order to facilitate the redeployment of fishing units as appropriate; and;
h) implementation of a strong educational campaign as a complement to measures involving licensing as a means to control individual entry into the fishery.

Possible Technical Measures to Regulate Fishing: Beach and purse seine restrictions

1. Beach seining is a particularly destructive method of fishing wherever it is practised on the lake, both because it exploits inshore fish habitats and nursery areas and because of its highly unselective nature. Management measures should aim at the total retirement/phasing out of beach seining on the lake. As a step towards this objective, 'beach seining prohibited' areas should be identified and established.

2. Initiatives to restrict beach seining would require important complementary measures in the form of environmental education and the opening up of other gear and method options as viable alternatives to the practice. With regard to the latter, strategic use could be made of input supply networks to encourage adoption of alternative gear kits.

3. Progressive CPUE decline in the industrial fishery in southern waters indicates a decrease of the catchable stock and possible over-exploitation of *L. stappersii* in southern waters, owing to uncontrolled growth of the industrial fishery. There are also indications of high exploitation pressure on *L. stappersii* within extreme northern waters, though in this case resulting from a concentration of artisanal liftnetting on top of a history of industrial purse seining.

4. For this reason, 'off-limits' areas for industrial units should be considered for both the extreme north and extreme south sub-basins.

Possible Input Controls to Regulate Fishing

5. Input control can be used to regulate fishing mortality through the imposition of limits on fishing capacity and effort. Typical mechanisms include licensing ceilings, individual effort quotas on fishing units, and the use of technical specifications to limit the harvesting power of vessels and/or their gear kits.

6. Principal examples of input controls relevant to the Lake Tanganyika situation are licensing ceilings for both the artisanal liftnet fishery and the industrial purse seine fishery.

7. Input or effort controls are indicated with respect to the industrial purse seine fisheries in the south of the lake (over-exploitation risk to *L. stappersii*), and the liftnet fisheries throughout the northern end (over-exploitation risk to *S. tanganicae* on both west and east coasts north of Karonda*)*.

8. It is thus recommended that licensing ceilings be established for both industrial units in the south and liftnet units in the north (waters north of Karonda). In the case of the purse seine fishery, effort should be reduced to levels that prevailed ten years ago. That is, licensing measures should aim at the gradual retirement or transfer to other fishing zones of units that entered the southern fishery within the last decade.

B.3 Expected Situation at End of FFMP Implementation Programme

9. The situation expected by the end of the Implementation Programme should reflect substantial improvements. They include:

a) A Lake Tanganyika regional fishery body with enhanced capabilities to undertake increased responsibilities for fisheries management and conservation measures.

b) The four lacustrine States and a regional fishery body with enhanced capabilities to implement provisions of the CCRF.

c) Improved legal regimes to support implementation of the CCRF.

d) The four lacustrine States and a regional fisheries body with enhanced capability to generate and use scientific advice for fisheries management.

e) The four lacustrine States with an improved and regionally integrated information service for the collection, analysis, and dissemination of data on catch and effort statistics, fleet characteristics and distribution, and basic socio-economic features of Tanganyika fishers and fishing communities.

f) The four lacustrine States with improved and regionally integrated systems for monitoring, control, and surveillance of fishing operations.

g) Policies adopted to restructure national fleet capacities and activities in accordance with requirements for the sustainable harvest of available resources.

h) Fishing operations around the lake conducted in a more responsible manner.

i) Improved performance in the Tanganyika fisheries post-harvest sector in accordance with CCRF principles and approaches.

B.4 Target Beneficiaries of the FFMP Implementation Programme

1. The target beneficiaries will be the fisheries policy-makers, scientists, and managers in the four lacustrine states and in the Tanganyika regional fishery body, all of whose capabilities will be enhanced to make use of improved approaches and methodologies with which to carry out their functions.

2. The indirect beneficiaries will be local Tanganyika fisherfolk and their families who depend on fisheries for a livelihood, as well as other fisheries stakeholders including industrial companies, coastal zone residents and resource users, and fish consumers both within and outside of the Tanganyika basin, all of whom will benefit from enhanced fisheries management and from training and awareness programmes.

3. The ultimate beneficiaries will be future generations who will benefit from improved harvesting and management practices that will contribute towards a sustainable and biological diverse Tanganyika aquatic ecosystem.

B.5 Strategy and Institutional Arrangements

4. The FFMP Implementation Programme shall provide an overall framework for addressing the Lake Tanganyika fisheries management problems identified in sections B.1 and B.2 above through a set of projects that may be funded by:

a) contributions to a common fund to finance sub-programme activities;
b) cost-sharing by donors to meet one or more of the sub-programme objectives;
c) single donor support to meet one or more of the objectives of sub-programmes; or
d) direct financing and execution by one or more donors to meet one or more of the objectives of the sub-programmes.

B.6 Reasons for Assistance

1. FAO completed the CCRF in October 1995 for adoption by States on a voluntary basis. The Lake Tanganyika Framework Fisheries Management Plan was completed by the LTR Project in 1999 and submitted through the CIFA Lake Tanganyika Sub-Committee for consideration and adoption as appropriate by the four Lake Tanganyika littoral States. The

FFMP is based on the extensive foundation of hydrobiological, socio-economic, and legal-institutional information developed through six years of project research and monitoring activities, and is drafted in accordance with CCRF principles and practices.

2. It is evident than effective adoption and implementation of the FFMP will require a variety of follow-on or accompanying measures in the form of technical assistance and capacity-building activities for the Lake Tanganyika States. The proposed FFMP Implementation Programme is intended to design and deliver these measures in an integrated and timely fashion.

B.7 Special Considerations

3. Close co-operation in programme operations will be maintained with international, national, and non-governmental organisations concerned with projects and activities related to the maintenance of biodiversity and the prevention of pollution in the Lake Tanganyika basin, and with supporting the interests of fishworkers, especially in the traditional and artisanal fisheries of the lake.

C. DEVELOPMENT OBJECTIVE OF THE FFMP IMPLEMENTATION PROGRAMME

1. The development objective is the conservation and harvesting of Lake Tanganyika fisheries resources, conducted within a framework that will encourage sustainable development, foster protection of the aquatic environment, maintain a diverse ecosystem, and make a substantial contribution to regional food security.

C.1 Programme Components

2. The five components of the Lake Tanganyika FFMP Implementation Programme have been prepared as separate, largely stand-alone projects. However, programme administrators would use Component 1, 'FFMP/FishPlan,' as the lead project to ensure a high level of co-ordination in order to avoid any duplication of activities.

3. The projected global programme budget amounts to some USD 25 million. This amount reflects a minimum programme duration of five years – a timeframe that has been set in view of the considerable geographical and technical scale of the work to be undertaken. The projected budget further reflects the substantial infrastructure development and training activities that are anticipated, particularly in the areas of fishing fleet restructuring and enhancement of post-harvest sector performance.

4. A summary of each component project is given in the following Annexes.

- Annex A. Component 1: Fisheries Policy, Planning, and Management ('FFMP/FishPlan');
- Annex B. Component 2: Fisheries Statistics and Information Systems ('FFMP/FishStat');

Annex C. Component 3: Monitoring, Control, and Surveillance ('FFMP/FishMCS');
Annex D. Component 4: Promotion of Responsible Fishing Operations and Fishing Fleet Annex Restructuring ('FFMP/FishFleetOps'); and
Annex E. Component 5: Post Harvest Practices and Trade ('FFMP/FishTrade').

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ANNEX A

PROJECT PROFILE, COMPONENT 1

Component Project Title: Lake Tanganyika Fisheries Policy, Planning, and Management ('FFMP/FishPlan');

Donor(s): To be determined.

Donor Contribution: USD 5,000,000. (Projected -- To be verified by feasibility study mission.)

Duration: 5 Years

Starting date: 2000

A. COMPONENT BACKGROUND

Guidelines for the implementation of the CCRF call for the promotion of effective approaches and methodologies in the areas of fisheries policy, planning, and management. These include planning methodologies and tools (e.g. strategic, participatory, and integrated planning, information systems, modelling) and the application of alternative management techniques (e.g. community-based management, effort control, property rights allocation, integrated coastal area management).

Proper formulation of fisheries policy is a complex task and needs to be based on a strategic planning framework encompassing analysis, elaboration, and review of policy options. At present strategic analysis is not adequately applied to Tanganyika regional fisheries and existing practices do not take fully into account the special characteristics of the fisheries sector and its inter-sectoral linkages.

Exchange of experiences and expertise in the areas of fishery policy, planning, and management offer the possibility of identifying the most appropriate approaches and methods under the range of environmental, economic, and social conditions that exist within the region. The sharing of experiences on a regional basis will assist in the rapid dissemination of new knowledge and methods.

The importance of participation of stakeholders in resources management and their collaboration in a responsible use of resources has been widely recognised. Concerted efforts of different users are necessary to ensure appropriate conservation and management of aquatic resources. In management of fishery resources, due consideration should be given to traditional and customary rights of local fishing communities highly dependent on fishery resources for their livelihood. Institutional arrangements are required so that fishing communities are adequately represented in the decision-making process. To ensure

sustainable resource exploitation, appropriate management measures can be taken only when compliance with these measures can be assured. It is therefore imperative to properly assess management practices and their use in effective governing of resources.

B. COMPONENT OBJECTIVE

The overall objective of this component is the implementation of CCRF standards and practices through the enhancement of fisheries policy, planning, and management capacities within the administrative and research agencies directly involved with the fisheries of Lake Tanganyika in the respective bordering States.

FFMP/FishPlan is also designated as the co-ordinating project for the overall FFMP Implementation Programme, and will thus serve administrative and operational purposes as well.

C. COMPONENT OUTPUTS

C.1 Output No. 1

Improved approaches and methodologies in the area of fisheries policy-making, planning, and management.

Activity 1.1

Preparation of selected case studies by national institutions of existing policy-making, planning and management approaches in Tanganyika fisheries and identification of critical elements (information tools, roles of stakeholder organisations, local apprehension of fisheries and wider environmental problems, inter-sectoral co-ordination mechanisms) and areas and possible modalities for improvement.

Activity 1.2

Conduct of regional workshop to review and discuss results of case studies, derive improved approaches and methodologies including strategies for setting up of decentralised management structures, and formulate measures (e.g. extension and training) to strengthen policy, planning, and management capacities.

Activity 1.3

Development of training and capacity-building programmes (curricula, materials) with respect to the items identified under Activity 1.2, in order to:

a) increase awareness and appreciation of responsible fishing practices and environmental issues amongst local fisherfolk and other Tanganyika fisheries stakeholders;
b) promote decentralised management structures; and

c) promote integrated development through the Coastal Area Management approach.

Activity 1.4

Promote networking amongst administrative and research units and staff concerned with Tanganyika fisheries policy, planning, and management.

C.2 Output No. 2

A Lake Tanganyika regional fishery body with enhanced capabilities to undertake increased responsibilities for fisheries management and conservation measures.

Activity 2.1

Provide appropriate administrative, training, and infrastructural support to facilitate the establishment and operation of a Lake Tanganyika regional fishery body.

C.3 Output No. 3

Management support for the overall FFMP Implementation Programme.

Activity 3.1

Provide co-ordination and administration services for all programme components, including operation of a central programme office with responsibility for personnel and financial administration, communications facilities, secretarial assistance, and general logistical support.

D. STRATEGY AND INSTITUTIONAL ARRANGEMENTS

1. It is envisioned that the FFMP/FishPlan component will co-ordinate closely with the global FAO TRAINFISH Project (FAO 1998), which highlights the use of modularised standard training packages and participatory approaches to the development and delivery of training at national and local levels. Close co-ordination will also be maintained with the FAO Fisheries Policy and Planning Division in carrying out the above activities.

2. FFMP/FishPlan is further intended to serve as the co-ordinating component for the overall Implementation Programme. As such, appropriate organisational arrangements will be devised to allow FFMP/FishPlan to assume general administrative and reporting responsibilities in support of the four other components.

E. INPUTS

E.1 Government inputs in kind

Governments will be expected to give full co-operation through the participation of staff and the supply of premises, equipment, and services.

E.2 Donor inputs

Budget lines	Person/ Months	US$
Expert services in the following fields:		
a) Fisheries policy and planning	60	1,200,000
b) Training (Consultants)	24	480,000
Office support personnel	120	600,000
Case studies (4)	12	60,000
Regional workshops (2)	--	80,000
Duty travel	--	150,000
Equipment & supplies	--	1,500,000
Premises (Programme HQ)	--	600,000
Miscellaneous	--	330,000
Donor Input Grand Total	**--**	**5,000,000**

ANNEX B

PROJECT PROFILE, COMPONENT 2

Component Project Title: Lake Tanganyika Fisheries Statistics and Information Systems ('FFMP/FishStat')

Donor(s): To be determined.

Donor Contribution: USD 2,500,000. (Projected -- To be verified by feasibility study mission.)

Duration: 5 Years

Starting date: 2000

A. COMPONENT BACKGROUND

At the beginning of the LTR project it was apparent that fisheries monitoring and information processing capabilities at some of the lakeshore stations were extremely weak. Extensive collaborative work with national administrators and researchers was conducted in order to strengthen these capabilities and to assemble the sort of information base that is a first requirement of fisheries planning and management. It is obvious that planning and management efforts will be impossible to pursue in future unless a regular lakewide monitoring programme is kept in place. Critical to any such programme is a fisheries statistics and information system providing timely, reliable, and complete data on catch and effort and basic socio-economic indicators for the sector. The FishStat component project is intended to build on the monitoring activities initiated under LTR, further strengthening statistical capabilities within the respective national fisheries agencies responsible for Lake Tanganyika and consolidating an institutionalised basis for co-operation between them.

B. COMPONENT OBJECTIVE

A standard statistical programme shared by the fisheries agencies of the Lake Tanganyika States that operates in a self-sustaining and cost-effective manner to provide data collection, analysis, and reporting services in support of regionally integrated and transparent fisheries conservation, management, and planning activities.

C. COMPONENT OUTPUTS

C.1 Output No. 1

An agreed statistical system for catch and effort data and socio-economic key indicator data for use by the respective fisheries agencies responsible for Lake Tanganyika.

Activity 1.1

Review and update, as appropriate, the structure, scope, and procedures of statistical related activities designed under the LTR Project for an extended Lake Tanganyika Monitoring Programme.

Activity 1.2

Bring existing statistical systems and facilities into conformity with the agreed system through a programme of training and technical assistance at the respective national lakeshore stations.

Activity 1.3

Convene a series of workshops bringing together key personnel responsible for statistics and information management from lakeshore stations within each national sector, in order to co-ordinate procedures for implementation of the agreed harmonised system.

C.2 Output No. 2

Regularly updated provision of essential statistical and informational tools for effective fisheries management and planning to the respective national fisheries administrations, community-based monitoring and management groups, the regional CIFA Sub-Committee for Lake Tanganyika, and its successor Lake Tanganyika regional fishery body as the latter becomes operational.

Activity 2.1

Set up a regional reporting system that will allow rapid transfer of data between the respective lacustrine countries, and between the countries and: a) the CIFA Sub-Committee and any of its working groups; b) the CIFA Sub-Committees successor Lake Tanganyika regional fishery body (when operational); and c) FAO/ Fishery Information, Data and Statistics Unit (FIDI) for the further dissemination of the aggregated data.

D. STRATEGY AND INSTITUTIONAL ARRANGEMENTS

1. It is envisioned that the FFMP/FishStat component will co-ordinate closely with FAO/FIDI in arranging details of computer training and hardware and software installation and support. FIDI's suite of statistical approaches and computer software for the harmonisation of fishery statistical monitoring techniques, known as ARTFISH, can serve as a basis for the Tanganyika regional statistics and information system.

E. COMPONENT INPUTS

E.1 Government inputs in kind

Governments will be expected to give full co-operation through the participation of staff and the supply of premises, equipment, and services.

E.2 Donor inputs

Budget lines	Person/ months	US$
Expert services in the following fields:		
a) Fisheries Statistics and Information Systems (Initial one year assignment with 4 follow-up missions of 2 months each)	20	400,000
National training workshops (4)	12	80,000
Regional training workshops (2)	--	80,000
Duty travel	--	140,000
Equipment & supplies	--	1,500,000
Miscellaneous	--	300,000
Donor Input Grand Total	--	2,500,000

ANNEX C

PROJECT PROFILE, COMPONENT 3

Component Project Title: Lake Tanganyika Fisheries Monitoring, Control, and Surveillance ('FFMP/FishMCS')

Donor(s): To be determined.

Donor Contribution: USD 1,500,000 (Projected -- To be verified by feasibility study mission.)

Duration: 5 Years

Starting date: 2000

A. COMPONENT BACKGROUND

CCRF guidelines characterise MCS as indispensable to effective management. Its three elements are commonly defined as follows.

a) Monitoring – the continuous requirement for the measurement of fishing characteristics and resource yields.
b) Control – the regulatory conditions under which the exploitation of the resource may be conducted.
c) Surveillance – the degree and types of observation required to maintain compliance with the regulatory controls imposed on fishing activities.

As shown by LTR legal-institutional studies, regional fisheries administrations labour under financial, staffing, and operational shortcomings that severely limit their ability to provide adequate MCS services. The studies offer the further reminder that such shortcomings are not likely to be resolved in any meaningful way over the near-term. In this connection, greater use of co-management arrangements in relation to MCS activities may offer substantial advantages in terms of cost-reduction and efficiency gains.

If local stakeholders could be encouraged to assume a greater share of responsibility, it is conceivable that local fisheries authorities could accomplish monitoring and enforcement purposes on a 'more-for-less' basis. In some circumstances, it may be possible to use existing local-level authority structures and customary practices to facilitate self-policing and shared responsibility for MCS activities.

There is a general need to translate the measures proposed in the Tanganyika FFMP into national fisheries regulations and to ensure that fisheries legislation pertaining to Lake

Tanganyika is harmonised across the four lacustrine States. The FishMCS component project is intended to facilitate these objectives.

B. COMPONENT OBJECTIVE

Enhance and upgrade national MCS capabilities in a regionally co-ordinated fashion within the framework of the CCRF.

C. COMPONENT OUTPUTS

C.1 Output No. 1

Agreed guidelines for effective establishment and upgrading of national competencies in MCS.

Activity 1.1

Conduct an initial regional workshop involving principal national fisheries personnel responsible for MCS in order to review previous studies and recommendations pertaining to Lake Tanganyika MCS and to discuss and adopt region-wide guidelines for action.

Activity 1.2

In the context of the above workshop, further discuss and adopt a workplan to implement MCS measures according to agreed guidelines.

C.2 Output No. 2

Technical assistance and advice on ways and means of strengthening national MCS systems in accordance with agreed guidelines.

Activity 2.1

Elaborate legal provisions for co-management mechanisms or structures with a view to facilitating the implementation of the management measures proposed under the FFMP.

Activity 2.2

Review the sanction regimes provided for in existing fisheries legislation to ensure their adequacy to carry out effectively the objectives of the FFMP.

Activity 2.3

Develop a comprehensive set of regulations on monitoring (type, frequency and format of required information).

Activity 2.4

Elaborate a model set of regulations applicable to all countries that accommodates the management measures proposed under the FFMP (including harmonisation of licensing systems).

Activity 2.5

Ensure that such regulations are developed on the basis of broad participation of all Lake Tanganyika fisheries stakeholders, including local artisanal and industrial interest groups and fisheries administrators and researchers, by presenting them for discussion and review at national consultative workshops convened within the respective lacustrine States.

Activity 2.6

Facilitate the formulation of such regulations at the national level (draft regulations).

Activity 2.7

Conduct a wrap-up regional workshop towards the end of the project period involving principal national fisheries personnel responsible for MCS in order to review progress and experiences within the respective national contexts and to finalise arrangements through which agreed MCS activities are facilitated through the Lake Tanganyika regional fisheries body, once the latter becomes fully established and operational.

D. STRATEGY AND INSTITUTIONAL ARRANGEMENTS

FishMCS and FishStat are intended to be a complementary and close linkages between the two components will be maintained.

It is envisioned that the FFMP/FishMCS component will co-ordinate closely with the FAO Development Law Service in carrying out the above activities.

E. COMPONENT INPUTS

E.1 Government inputs in kind

Governments will be expected to give full co-operation through the participation of staff and the supply of premises, equipment, and services.

E.2 Donor inputs

Budget lines	Person/ Months	US$
Expert services in the following fields:		
a) International Fisheries Law and Monitoring, Control & Surveillance (MCS) (Initial one year assignment with 4 follow-up missions of 2 months each)	20	400,000
National consultative workshops (4)	--	80,000
Regional legal planning workshops (2)	--	80,000
Duty travel	--	140,000
Equipment & supplies	--	500,000
Miscellaneous	--	300,000
Donor Input Grand Total	--	1,500,000

ANNEX D

PROJECT PROFILE, COMPONENT 4

Component Project Title: Promotion of Responsible Fishing Operations and Fishing Fleet Restructuring ('FFMP/FishFleetOps')

Donor(s): To be determined.

Donor Contribution: USD 8,000,000. (Projected -- To be verified by feasibility study mission.)

Duration: 5 Years

Starting date: 2000

A. COMPONENT BACKGROUND

Total annual catches from Lake Tanganyika have shown an increasing trend over recent decades. However, LTR Project investigations under the Scientific Sampling Programme also indicate that risks of excess fishing pressure have developed on all three of the main commercial stocks. For the northern end of the lake, such risks are apparent with *S. tanganicae* in terms of high juvenile content and smaller mean length in catches. With regard to the highly unselective beach seine fishery, mostly prosecuted in Zambia, it is clear that there is heavy targeting of juvenile *L. miodon* in their shallow, inshore nursery grounds. At the same time, beach seines are inflicting substantial damage on the mainly cichlid coastal fish community.

The drastic decline in industrial fishing in northern waters is reflected in the migration or retirement of many purse seine units. Many of the northern units have been shifted to Zambia in the south of the lake. The result has been a seven-fold growth in purse seining effort in Zambian waters (from 3 to 23 active units since 1983), almost exclusively harvesting *Lates stappersii,* which now comprise 95% of the industrial catch. Development of the purse seine fishery from the 1950s soon resulted in a substantial reduction in the harvest of other *Lates* species, i.e. *L. mariae*, *L. microlepis*, and *L. angustifrons*, all of which seem to be particularly vulnerable to localised over-fishing. Today's simple composition of the pelagic stocks, with two clupeids and *L. stappersii*, is one very striking outcome of the selective pressures imposed by the mechanised large-scale fishery.

Progressive CPUE decline and increased duration of fishing trips in the industrial fishery in southern waters indicates a decrease of the catchable stock and possible over-exploitation of *L. stappersii* owing to uncontrolled growth of purse seining. Indications of possibly excessive exploitation pressures on *L. stappersii* have also been noted for the northern end of the lake,

as a result of the effects of successive waves of heavy industrial fishing and artisanal fishing. *L. stappersii* now make up only around 20% of the commercial catch in northern waters, with juveniles accounting for most of this contribution.

It is notable that LTR socio-economic survey results indicate a widespread perception on the part of local fisherfolk that is largely in accordance with findings of the project's Scientific Sampling Programme. Local views on the state of commercial fish stocks indicate that a degree of pessimism, or at least uncertainty, exists with regard to the ability of the lake's fisheries to sustain adequate levels of livelihood security. Fishers and post-harvest operators are very pessimistic in their appraisals of catch trends over recent years: majorities in all cases take the view that they have been on the decrease. Opinion as to whether future catches will be lower, higher, or the same tends to be divided or undetermined (i.e., responses of 'No opinion').

Evidence of possible over-exploitation of commercial fish stocks in Lake Tanganyika needs to be appreciated in an overall regional context where demand for fish is constantly on the increase. Fish accounts for some 25% to 40% of total animal protein supply for the populations of the four Lake Tanganyika States, so its significance for nutritional welfare is obviously considerable. At the same time, rapid population growth within the Tanganyika basin and across East-Central Africa as a whole fuels an ever-increasing demand for fish products, so that over the last several decades per caput supply has barely kept pace with overall fish production, despite increases in the latter.

The Lake Tanganyika FFMP proposes the introduction of several measures to regulate fishing mortality and thus foster conditions of sustainability in the major commercial fisheries.

Combination gear type restrictions and area restrictions are recommended for application to both the beach seine fishery and the industrial purse seine fishery. Thus,

a) Management measures should aim at the total retirement/phasing out of beach seining on the lake.
b) As a step towards this objective, 'beach seining prohibited' areas should be identified and established.
c) Measures should further aim to establish 'off-limits' areas for industrial units for both the extreme north and extreme south sub-basins of the lake.

Further measures are proposed in the form of input or effort controls on the liftnet and industrial fisheries.

It is thus recommended that:

d) Licensing ceilings should be established for both industrial units in the south and liftnet units in the north (waters north of Karonda).
e) In the case of the purse seine fishery, effort should be reduced to levels that prevailed ten years ago. That is, licensing measures should aim at the gradual

retirement or transfer to other fishing zones of units that entered the southern fishery within the last decade.

The FFMP recognises however that such measures to regulate fishing mortality would cause severe short-term socio-economic disruption for fisheries-dependent populations around the lake were they to be strictly imposed in and of themselves. Complementary measures are clearly needed to ameliorate these disruptive effects and to open viable alternatives to present practices.

The FishFleetOps component project is intended as a pilot undertaking focusing on resolution of the complex of problems associated with destructive fishing practices, marketing constraints, and stakeholder group conflicts through the provision of such complementary measures.

B. COMPONENT OBJECTIVE

Development and demonstration of viable alternative approaches to present harvesting practices and fleet structures in the beach seine, lift net, and industrial fisheries on Lake Tanganyika in order to promote conditions of sustainability over the long term, in accordance with CCRF guidelines.

C. COMPONENT OUTPUTS

C.1 Output No. 1

Socio-economic and technological assessment of existing artisanal beach seine and industrial purse seine fisheries, and possible alternative fishing technologies, gear assemblages, and fleet dispositions.

Activity 1.1

National case studies to determine the distribution of employment and other human welfare benefits or costs associated with each fishery and the advantages and disadvantages that a fleet restructuring programme might entail, including a technological appraisal of such restructuring.

Activity 1.2

Conduct of regional workshop for presentation and review of above studies.

Activity 1.3

In the context of the above workshop, further discuss and adopt a workplan to implement a pilot programme of fleet restructuring.

C.2 Output No. 2

Assessment, design, and testing of beach seine alternative technology.

Activity 2.1

Determine design requirements for safe and efficient liftnet units that could serve as suitable alternatives to the beach seine, particularly under the rougher wind and sea conditions that prevail in the southern waters of the lake.

Activity 2.2

Fabrication and testing of prototypes of the above liftnet units.

Activity 2.3

Pilot operations for the retirement of existing purse seine units from direct fishing operations and their redeployment as support and catch collection vessels for the artisanal fishing fleet.

C.3 Output No. 3

Awareness programmes for responsible fishing operations and protection of the aquatic environment.

Activity 3.1

Preparation of audio-visual material for presentation to local audiences of fisheries officers, fishers, and fishing community residents.

Activity 3.2

Consultation and educational workshops involving local fisher groups and industrial company executives and staff.

D. STRATEGY AND INSTITUTIONAL ARRANGEMENTS

It is envisioned that the FFMP/FishFleetOps component will co-ordinate closely with the FAO Fisheries Industries Division in carrying out the above activities.

E. COMPONENT INPUTS

E.1 Government inputs in kind

Governments will be expected to give full co-operation through the participation of staff and the supply of premises, equipment, and services.

E.2 Donor inputs

Budget lines	Person/ months	US$
Expert services in the following fields:		
a) Fisheries socio-economics and development planning/extension.	60	1,200,000
b) Fishing technology	60	1,200,000
National consultative/training workshops (8) and related training/educational activity	--	500,000
Regional consultative/training workshop	--	80,000
Duty travel	--	400,000
Equipment & supplies	--	4,000,000
Miscellaneous	--	620,000
Donor Input Grand Total	--	8,000,000

ANNEX E

PROJECT PROFILE, COMPONENT 5

Component Project Title: Post Harvest Practices and Trade ('FFMP/FishTrade')

Donor(s): To be determined.

Donor Contribution: USD 8,000,000 (Projected -- To be verified by feasibility study mission.)

Duration: 5 Years

Starting date: 2000

A. COMPONENT BACKGROUND

Poor infrastructure and natural barriers impose heavy constraints on fish processing and marketing possibilities around Lake Tanganyika. Steep escarpments restrict overland access to much of the shoreline. Although transport corridors link the larger towns with their hinterlands, feeder routes to outlying fishing and processing communities are not effectively developed. Furthermore, there are few facilities for energy-intensive techniques of fish handling and processing, e.g. chilling, freezing, or canning. The best equipped plants are found in Mpulungu and on a more limited basis in Kalemie.

The bulk of fish landed at most sites must of necessity be processed in some fashion in order to extend its shelf life for marketing purposes. Simple sundrying on the beach or ground is easily managed under local conditions, requiring little input other than labour. It is by far the most common method of processing clupeids and *L. stappersii*, which constitute the greater bulk of the lakewide catch.

Reliable statistics are lacking on the volume of product flow along the various marketing channels that reach beyond the lake basin. However, major outlets for dried fish are long established and well known. In addition to the mining districts of Shaba Province in the DRC and the Zambian Copperbelt, supplies reach the Dar es Salaam market through the railway connection from Kigoma. North of the lake, Bukavu and Goma in the DRC and towns in Rwanda and further afield have in recent years become important market destinations as well.

Constraints on commerce imposed by geographical barriers and weak marketing structures produce differing effects, depending on location. On the one hand, they limit the growth of fishing pressure and the risk of over-exploitation across wide stretches of the lake. On the other hand, they may encourage basin inhabitants, including refugees displaced by outbreaks of civil conflict, to migrate to the more easily accessible landing sites around the lakeshore. Fish is more readily available to consumers at these places, and they further offer the

possibility of fishery-related employment. In such instances the effect is to magnify localised fishing pressure and the risk of over-exploitation.

B. COMPONENT OBJECTIVE

Improved performance in the Tanganyika fisheries post-harvest sector in accordance with principles and approaches outlined in the CCRF

C. COMPONENT OUTPUTS

C.1 Output No. 1

Regional overview of present status of fisheries post-harvest practices and trade for the Lake Tanganyika basin.

Activity 1.1

National case studies to determine actual networks and volume of product flow and the constraints that need to be overcome or ameliorated in order to apply the principles of the CCRF pertaining to the post-harvest sector.

Activity 1.2

Conduct of regional workshop for presentation and review of above studies.

Activity 1.3

In the context of the above workshop, further discuss and adopt a workplan for a pilot programme to improve performance in the post-harvest sector.

C.2 Output No. 2

Infrastructure development and industry and public awareness programme for responsible post-harvest operations.

Activity 2.1

Preparation of an industry consultation and training programme to build awareness at regional, country, and local levels for quality assurance practices in fish handling, processing, and marketing in order to minimise economic losses, environmental impacts, and health risks.

Activity 2.2

Implementation of a complementary pilot technical assistance programme to build capacity at regional, country, and local levels to facilitate widespread adoption of the above practices.

D. STRATEGY AND INSTITUTIONAL ARRANGEMENTS

It is envisioned that the FFMP/FishTrade component will co-ordinate closely with the FAO Fisheries Industries Division in carrying out the above activities.

E. COMPONENT INPUTS

E.1 Government inputs in kind

Governments will be expected to give full co-operation through the participation of staff and the supply of premises, equipment, and services.

E.2 Donor inputs

Budget lines	Person/ Months	US$
Expert services in the following fields:		
a) Fisheries socio-economics/marketing/ development planning/extension.	60	1,200,000
b) Fish technology/product development	60	1,200,000
National consultative/training workshops (8) and related training/educational activity	--	500,000
Regional consultative/training workshop	--	80,000
Duty travel	--	400,000
Equipment & supplies	--	4,000,000
Miscellaneous	--	620,000
Donor Input Grand Total	--	8,000,000