

Japan International Cooperation Agency

NO. 2

Ministry of Natural Resources and Tourism
Fisheries Division
The United Republic of Tanzania

THE MASTER PLAN STUDY ON FISHERIES DEVELOPMENT IN THE UNITED REPUBLIC OF TANZANIA

SUMMARY

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JUNE 2002

SYSTEM SCIENCE CONSULTANTS INC.

OVERSEAS AGRO-FISHERIES CONSULTANTS CO. LTD.

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Composition of Final Report

Final Report consists of 3 volumes listed below:

Summary

Main Report

Data Book

Preface

In response to the request from the Government of the United Republic of Tanzania, the Government of Japan decided to conduct the Study on the Fisheries Development Master Plan and entrusted the study to Japan International Cooperation Agency (JICA).

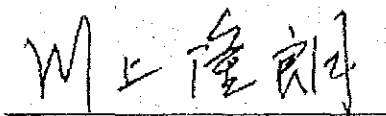
JICA sent to the United Republic of Tanzania the study team headed by Mr. Sachio Yamamoto, System Science Consultants inc., four (4) times between January 2001 and April 2002.

The team held discussions with the officials concerned of the Government of the United Republic of Tanzania, and conducted field survey and investigation in the study area. After the team returned to Japan, further studies were made and this report was prepared.

I do hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the United Republic of Tanzania for their close cooperation extended to the team.

June 2002

A handwritten signature in black ink, consisting of stylized characters, likely representing the name Takao Kawakami. The signature is written above a horizontal line.

Takao KAWAKAMI
The President of
Japan International Cooperation Agency

June 2002

Mr. Takao KAWAKAMI
The President of
Japan International Cooperation Agency
Tokyo, JAPAN

Letter of Transmittal

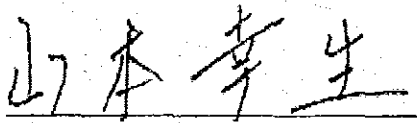
Dear Sir,

We are pleased to submit to you the report for "The Master Plan Study on Fisheries Development in the United Republic of Tanzania". This report presents the result of all work performed in both Tanzania and Japan over 18 month period from January 2001 to June 2002.

Tanzania is endowed with rich fisheries resources, including coastline of 800km, Lake Victoria, Lake Tanganyika and Lake Nyasa. The fisheries sector has large potential to contribute to the life of the people. Under the condition of the country has been applied "Heavily Indebted Poor Country", the Tanzanian Government tackle on the poverty reduction beyond the sector. This Master Plan provided fisheries development strategies and fifteen (15) priority programmes, with consideration how the sector plays the role to the national development policy. Implementation of the programme will contribute to reduce the poverty through the improvement of the food security, marine/lake environment, fish export and livelihood of fisheries community.

We wish to express our deep appreciation and sincere gratitude to the officials concerned of your Agency, the Ministry of Foreign Affairs, and the Ministry of Agriculture, Forestry and Fisheries of the Government of Japan for the courtesies and cooperation kindly extended to our team. We additionally inform you that we had sincere cooperation from the Ministry of Natural Resources and Tourism of the Government of Tanzania, especially that our counterparts of the Fisheries Division participated the field study and planning, very actively. We also express our hearty gratitude to the officials concerned from Tanzanian Office of JICA, the Embassy of Japan in Tanzania for the close cooperation and various form of assistance extended to our team during field investigations and studies in Tanzania.

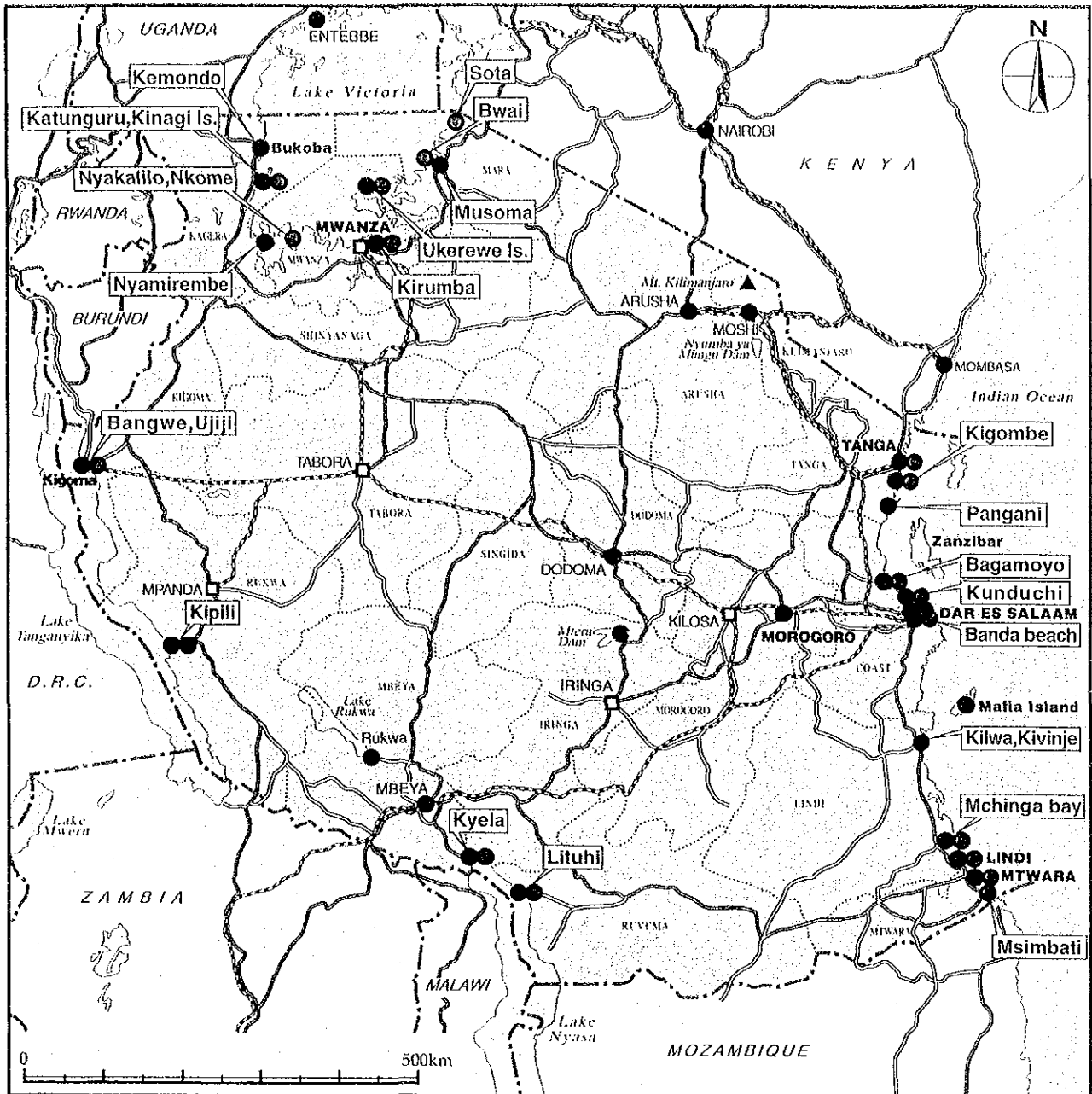
Very truly yours,



Sachio YAMAMOTO

Project Manager of the Master Plan Study on Fisheries Development in the United Republic of Tanzania

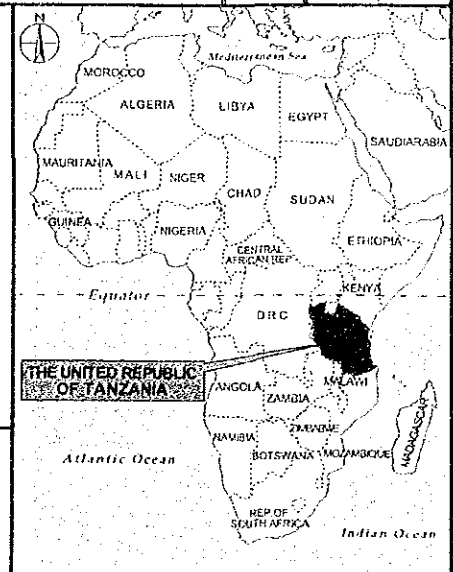
System Science Consultants inc., in consortium with
Overseas Agro-fisheries Consultants co. ltd.

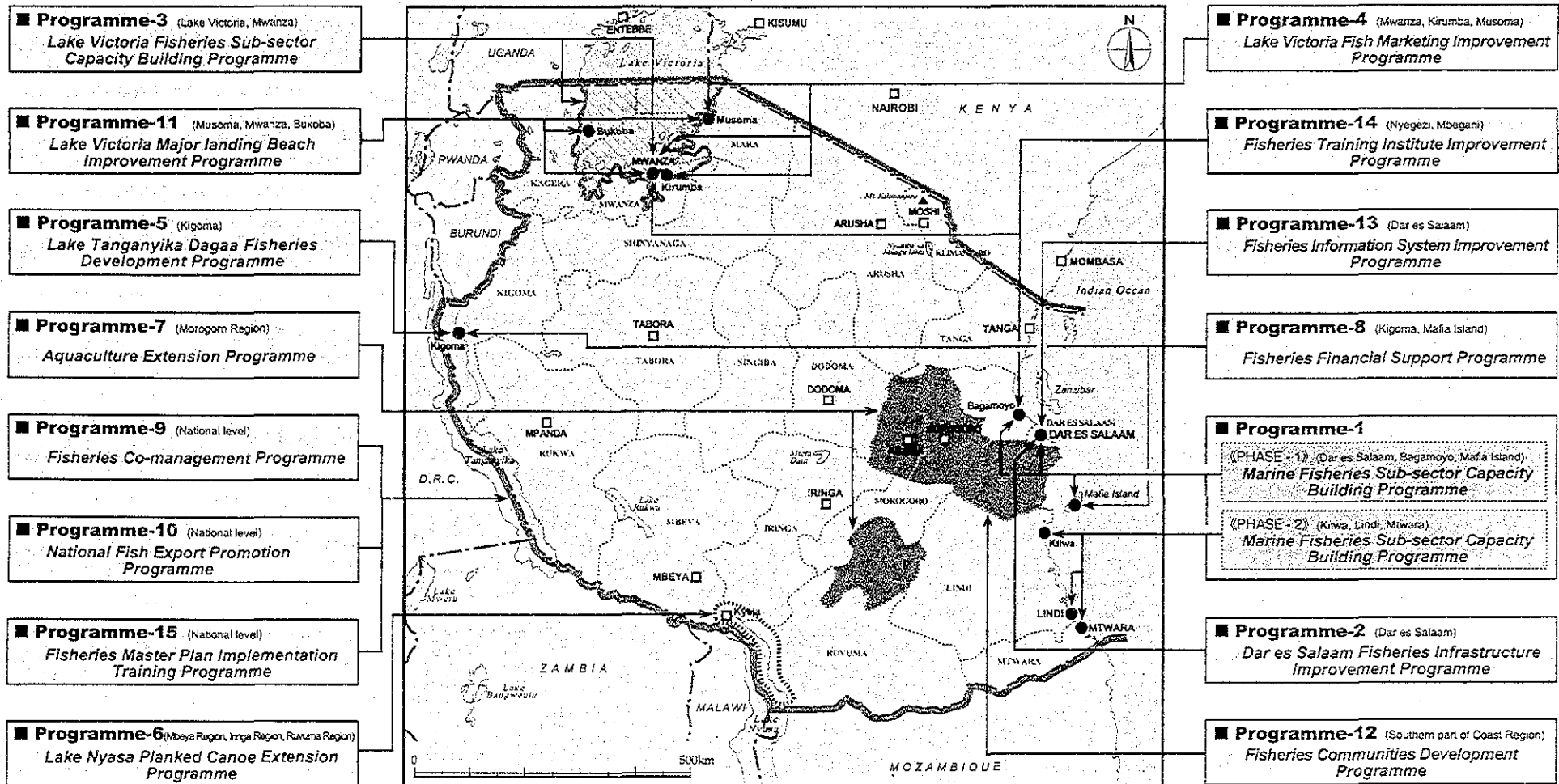


《 LEGEND 》

- International Boundary
- Regional Boundary
- Main City
- Site visited by Japanese team members
- Site visited by sub-contract survey team for socio-economic survey
- Main Road
- - - - - Rail Way

THE MASTER PLAN STUDY ON FISHERIES DEVELOPMENT
IN THE UNITED REPUBLIC OF TANZANIA
SURVEY SITE MAP

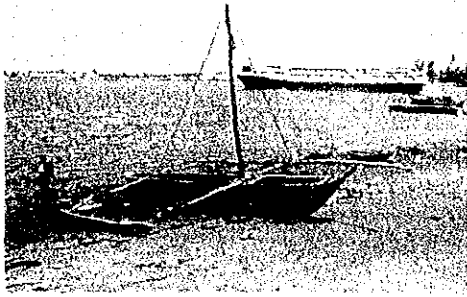




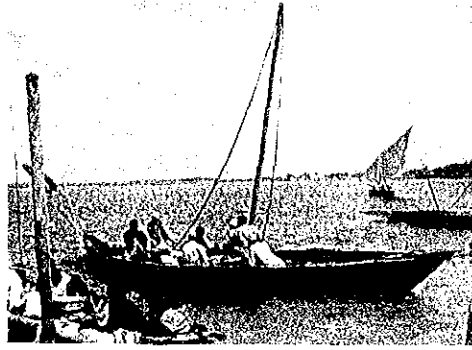
Location of priority programmes

Fishing Boats and Gears

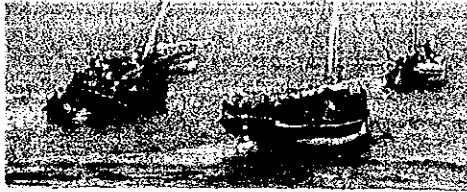
Marine



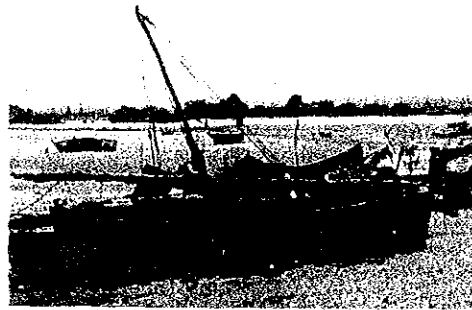
Fishing canoe with outriggers and mast.



Sailing Dau, length normally about 6 to 10 m.

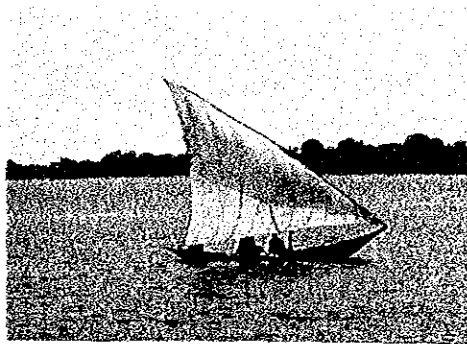


Mashua fishing boats with sails at Mafia Island.

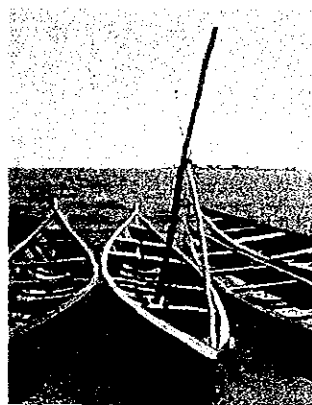


Mashua fishing boats at Kunduchi.

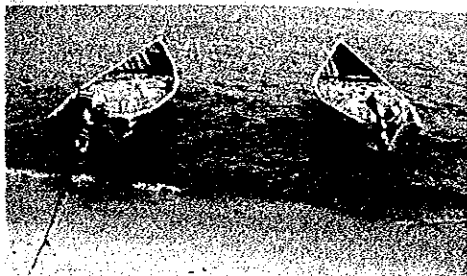
Lake Victoria



Sailing canoe on Lake Victoria fishing for Tilapia.



5 to 10 of these small canoes are normally towed by a mother boat to go fishing. They can be fitted with sail or peddle.

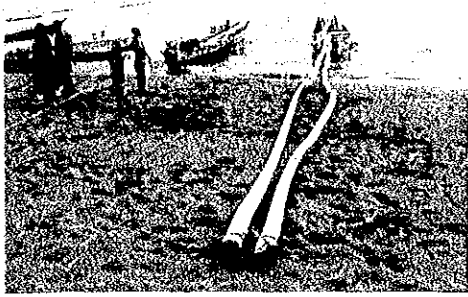


Nile perch fishing boats fitted with 25 to 40HP outboard engine.

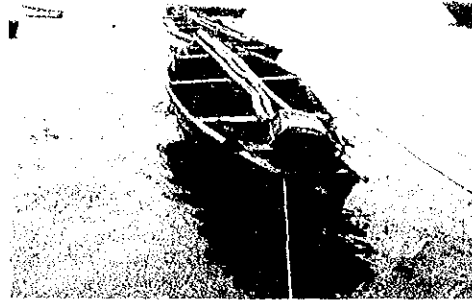


Fish carrier boats at Nkome.

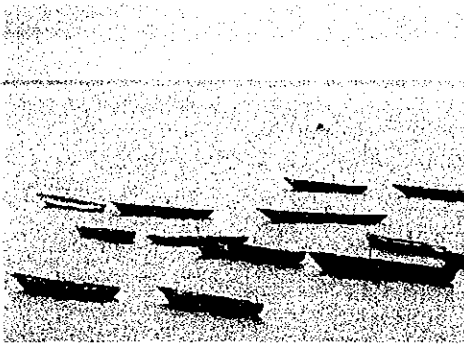
Lake Tanganyika



Dagaa fishing boats with poles to support lift nets.



Dagaa fishing boats with outboard engine.



Dagaa fishing boats seen on Lake Tanganyika.



Dagaa fishing boats landing at Katonga.

Lake Nyasa



Dugout canoes used on Lake Nyasa.

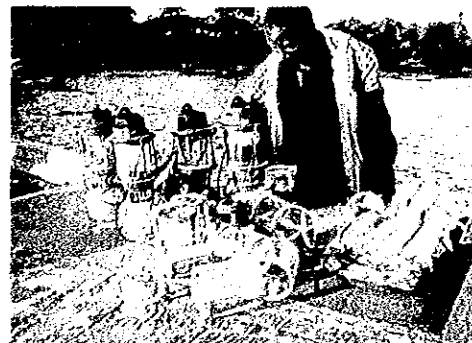


Dugout canoes used on Lake Nyasa.

Fishing Gears

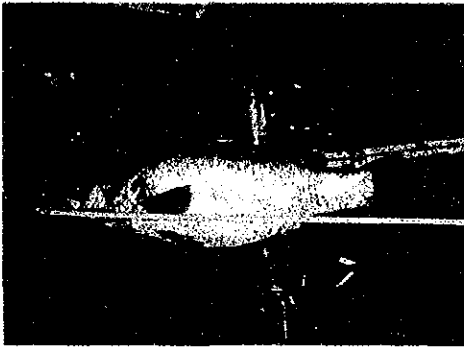


Handline wound on a plastic bottle container.

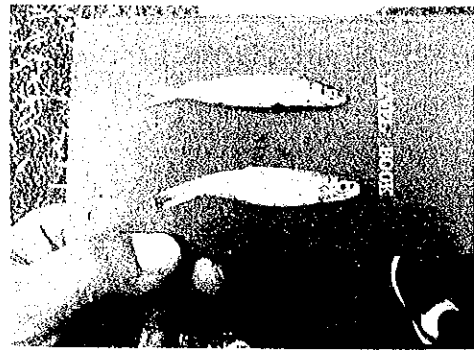


Pressurized kerosene lamps used for Dagaa fishing.

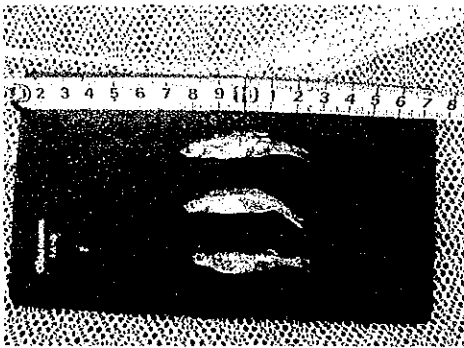
Major Economical Important Fish Species in Tanzania



Nile perch (*Lates niloticus*)



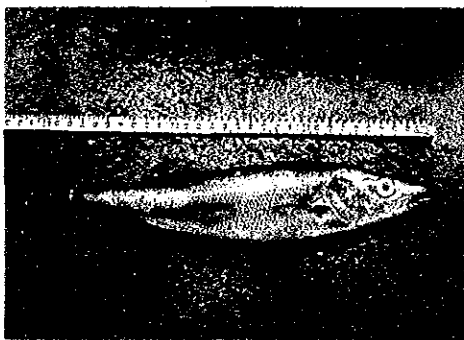
Dagaa from Lake Tanganyika (*S. tanganyicae*) called "Dagaa Kigoma"



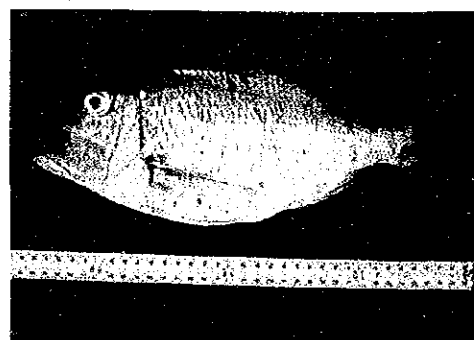
Dagaa from Lake Victoria (*Rastineobola argentea*) called "Dagaa Mwanza"



Tilapia in Lake Victoria (*Oreochromis niloticus*)



Migebuka (*Luciolates stappersii*) from Lake Tanganyika.



Changu (*Lutjanidae*). Normally about Tsh. 1,500 to 2,000/kg at Banda Beach Market.



Grouper (*Epinephelus*), Marine



Mbasa (*Barilius microlepis*) and Labeo, Lake Nyasa

Workshops



Participants (total about 60 people) at the National level workshop held at Morogoro from 30th October to 1st November.



Group discussion on the second day of the National level workshop. Participants were divided into 4 groups.



Technology transfer seminar held at Dar es Salaam on 18th and 19th April 2002.



Mr. Mtani, fisheries officer from Mafia island presents outcomes of group discussion on Master Plan at Technology transfer seminar.



Workshop held in 25th June 2001 for government fisheries officers.



Workshop held in February 2001 at Dar es Salaam to discuss the operation of the new fish market at Banda Beach.



Workshop held on August 2001 in Dar es Salaam to discuss the new fish market at Dar es Salaam and the administration management method.



Workshop held on April 2001 in Tanga to discuss fishers' problems and constraints.

Summary

Contents

Composition of Final Report

Preface

Letter of Transmittal

Project Site Map

Location of Priority Programme

Photographs

Abbreviation

Currency

1	INTRODUCTION.....	1
1.1	Background of the Master Plan Study	1
1.2	Overall Objectives of the Master Plan Study and the Beneficiaries	1
1.3	Term and Survey Areas for Master Plan	2
1.4	Survey Methods	2
2	OVERVIEW OF THE FISHERIES SECTOR.....	4
2.1	General Situation	4
2.2	Contribution of the Fisheries Sector to National Development	5
2.3	Issues of Fisheries Sector	6
3	BASIC DEVELOPMENT CONCEPT AND STRATEGY.....	12
3.1	Development Objectives	12
3.2	Structure of the Master Plan	12
3.3	Basic Concept and Strategy to Develop Fisheries	13
3.3	Basic Concept and Strategy to Develop Fisheries	14
4	PRIORITY PROGRAMMES	22
4.1	Composition of Priority Programmes	22
4.2	Priority Programmes	23
5	COST ESTIMATION	46
6	IMPLEMENTATION PLAN	47
6.1	Implementation Structure.....	47
6.2	Operation and Maintenance Plan	49
6.3	Implementation Schedule.....	49
7	EVALUATION	51
7.1	Socio-economic Benefit.....	51
7.2	Environmental Evaluation	52
8	RECOMMENDATIONS	54

Abbreviation

ALCOM	Aquaculture for Local Community Development Programme
BMU	Beach Management Unit
CIDA	Canadian International Development Agency
CRDB	Credit Rural and Development Bank
CPUE	Catch Per Unit Effort
DC	District Commissioner
DED	District Executive Director
FD	Fisheries Division
DFO	District Fisheries Officer
DSM	Dar es Salaam
EAC	East African Communities
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EU	European Union
FAD	Fish Aggregating Device
FAO	Food and Agriculture Organisation of the United Nations
FINNIDA	Finnish International Development Agency
FO	Fisheries Officer
FRP Boat	Fibre Reinforcement Plastic Boat
GDP	Gross Domestic Production
GPS	Global Positioning System
HACCP	Hazard Analysis Critical Control Point
HIPC	Heavily Indebted Poor Countries
IMF	International Monetary Fund
IUCN	International Union for the Conservation of Nature
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
LTR	Lake Tanganyika Research
LVEMP	Lake Victoria Environmental Management Project
LVFO	Lake Victoria Fisheries Organisation
LVFRP	Lake Victoria Fisheries Research Project
MNRT	Ministry of Natural Resources and Tourism
NGO	Non-Governmental Organisation
NIGP	National Income Generation Programme
NORAD	Norwegian Agency for Development Cooperation
OA	Office Automation
OJT	On the Job Training
PRSP	Poverty Reduction Strategy Paper
RAS	Regional Administrative Secretary
RIPS	Regional Integrated Project Support
SACCOS	Savings and Credit Cooperative Societies
SADC	South African Development Community
SIDO	Small Industry Development Organization
TAC	Total Allowable Catch
TAFICO	Tanzania Fisheries Cooperation
TAFIRI	Tanzania Fisheries Research Institute
TCZCDP	Tanga Coastal Zone Conservation & Development Programme
THA	Tanzania Harbour Authority
TRA	Tanzania Revenue Authority
UNCDF	United Nations Capital Development Funds
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
UNFPA	United Nations Population Fund
VETA	Vocational Education and Training Authority
WWF	World Wildlife Fund

Currency

Annual currency rate

	1995	1996	1997	1998	1999	2000	2001
1US\$: Tsh.	574.8	580.0	612.1	664.7	744.8	800.44	876.62
1US\$: ¥	94.1	108.8	121.0	130.9	113.9	107.06	118.33
¥ 1: Tsh.	6.11	5.33	5.06	5.08	6.54	7.48	7.41

Sources: The rates between US\$ and Tsh. for 2000 and 2001 are referred from Bank of Tanzania.

The rate between US\$ and ¥ is referred from IMF for 2000 and Bank of Japan for 2001.

The rests are referred from World Development Indicators.

1. INTRODUCTION

1.1 Background of the Master Plan Study

In 1997, the Tanzanian Government established the "National Fisheries Sector Policy and Strategy Statement 1997" as a basic policy for Fisheries Development. There, 18 policy statements and development issues are given. It is a national issue to promote sustainable development in fisheries, improve livelihood in fisheries villages, and secure stable food supply in future. On the other hand, through enforcement of HIPC (Heavily Indebted Poor Countries)¹ initiative in Tanzania since the year 2000, the national target has been focused on poverty alleviation. With poverty alleviation as a national development goal, cross-sectoral strategies have been introduced. Additionally, decentralisation enhances fisheries resource development and fisheries management by local government. This means fisheries administration in terms of participation of all stakeholders who have responsibilities on the use of fish resources, is strongly required today. This Master Plan Study on fisheries development, considering these situations, prepared an Action Plan for realization of the national framework and fisheries policy for further fisheries development.

This document is prepared as a final report through analysing data/ information, which have been obtained from existing publications, field interview surveys, and workshops between January and December 2001. The report presents development strategies and 15 priority programmes for their implementation.

"The Master Plan Study on Fisheries Development in the United Republic of Tanzania" was launched in January 2001 for an 18-month period (Jan. 2001-June 2002). The project is executed by System Science Consultants Inc. (SSC) and Overseas Agro-Fisheries Consultants Co. Ltd. (OAFIC), with Fisheries Division of the Ministry of Natural Resources and Tourism as the National Counterpart. It is funded by Japan International Cooperation Agency (JICA). The project aims to prepare the Fisheries Master Plan (Master Plan) which will provide guidance on priority areas and projects for sector development.

This final report is completed after the discussion and mutual agreement among all stakeholders in the National Seminar held in April, 2002.

1.2 Overall Objectives of the Master Plan Study and the Beneficiaries

This Master Plan aims at operationalising the National Fisheries Sector Policy and Strategy Statement (1998) and the overall objectives of the Master Plan are to develop a feasible integrated development strategy that will stimulate sustainable economic growth of the sector, in terms of food security, fishery environment and economic/social welfare of the fisheries communities.

The beneficiaries of this Master plan will be artisanal fisheries groups, such as fishers, small-scale traders, fish processors and their communities. The Fisheries staffs of the central and local governments, other related service institutions and NGOs are also included as beneficiaries.

¹ HIPC are countries that have GNP per capita below US\$ 659, and total financial dept exceeding 2.2 times the annual export or 80% of GNP. HIPC initiative is a plan for dept relief of HIPC that has been agreed among official creditors. HIPC are obligated to form PRSP, and through this procedure, 100% of ODA and 90% of non-ODA debt are to be reduced. Tanzania has completed PRSP by 2001.

1.3 Term and Survey Areas for Master Plan

This Master Plan aims to provide plans for 10 years starting from the year 2002.

This Master Plan is the national plan targeting the whole area of the United Republic of Tanzania except Zanzibar.

1.4 Survey Methods

Surveys for this project were implemented in two phases. Phase 1 survey was carried out from 8th January to 11th September 2001. Analysis on present conditions and basic development concepts are summarised as the main output in the interim report. Phase 2 survey has been implemented from 15th October 2001 to 10th June 2002 and main focus is on the planning of priority programmes based on basic development concepts.

For the field survey, 12 experts from this Study Team have visited major fisheries production sites (refer to the Project Site Map in front). They have extracted technical and political issues through observation on fishing activities and discussions with stakeholders in the sector. To assess the socio-economic condition of fishers and related traders, the Economic Research Bureau, University of Dar es Salaam as sub-contractor, has carried out household survey with 1,118 households and market/consumption survey with 1,090 questioners over 19 districts during June to August 2001. When the survey was implemented, the format of questionnaire from the Household Budget Survey 92 and others were applied in order to enable data comparison with national average, farming villages and fishing villages.

Data and information at village and district levels were collected through PRA (Participatory Rapid Appraisal). In PRA, some tools were also applied for institutional analysis. Gender assessment, management evaluation, and poverty analysis were included for assessing changes in the fisheries sector. Also, Study Team members have visited landing sites in order to understand the overall situation. Interviews and discussions were carried out with key persons and target groups. There, topics to be focused in this Master Plan were carefully surveyed. In the interviews, special attention was paid to encourage participants' frank opinion. Counterparts from Tanzanian Government also participated in those interviews and discussions at sites for understanding and clarifying issues.

The Project had implemented two national level workshops. One was held at Morogoro between 30th October and 1st November 2001, aiming at the mutual agreement on the basic development concepts. Fishers and District Fisheries Officers from major production areas across the nation participated and discussed the development concepts and approaches in each area. What was discussed in the workshop was reflected in the second stage of the Study for detailed survey and plans for priority programmes. Priority programmes and their implementation plan was discussed and agreed in the Technology Transfer Seminar, another national level workshop, held at Dar es Salaam on 18th and 19th April 2002.

It goes without saying that consistency between National development policy and Fisheries Development Policy shall be highly respected in the planning process. Planning of this Master Plan takes into consideration the role of the fisheries sector and its contribution to the National Development Policy, because presently, the government requires that all sectors commonly focus on poverty reduction under the Poverty Reduction Strategy Paper (PRSP). The planning process from National Policy to priority fisheries programmes which are presented in this Master Plan is shown in the next page.

Structure of the Fisheries Development Master Plan

National Policy	Contribution of the Fisheries Sector to the National Development	Issues of Fisheries Sector	Basic Concept	Development Strategy	Priority Programmes
Financial Stability and Rational Investment Focusing on Poverty Reduction	1. Contribution to Food Security and Nutrition	① Stagnant Fish Production, which cannot Meet Population Growth ② Undeveloped Fishers Organization ③ High Post Harvest Loss and Opportunity Loss of the Fresh Fish Trade, which derives Fishers of Better Incomes ④ High Fish Prices and Large Disparities in Prices among the Production Sites	Basic Concept 1: Stable Supply of Fish for Domestic Consumption	1.1 Strengthening Fisheries Cooperatives/ Organizations 1.2 Improvement of Fishing Technologies and Extension 1.3 Reduction of Post Harvest Losses and Promotion of the Fish Utilisation by Shifting from Non-food to Food Purposes 1.4 Reduction of Marketing Costs and Development of Fish Distribution System 1.5 Implementation of Feasibility Survey on Aquaculture and Establishment of a Development Model	1 Marine Fisheries Sub-sector Capacity Building Programme 2 Dar es Salaam Fisheries Infrastructure Improvement Programme 3 Lake Victoria Fisheries Sub-sector Capacity Building Programme 4 Lake Victoria Fish Marketing Improvement Programme 5 Lake Tanganyika Dagaa Fisheries Development Programme 6 Lake Nyasa Planked Canoe Extension Programme 7 Aquaculture Extension Programme 8 Fisheries Financial Support Programme
	2. Contribution to the Protection of the Marine Environment	⑤ Poor Co-management System on Fish Resources	Basic Concept 2: Sustainable Use of Fishery Resources	2.1 Strengthening of Fishers Organizations for Resource Co-management 2.2 Publication of Fisheries Statistics (1997-) and Preparation of Effective Data Processing System 2.3 Implementation of Monitoring on Fisheries Activities and Collection of Biological Information on Catches at Major Landing Sites by Fishers' Group	9 Fisheries Co-management Programme
Poverty Reduction aimed in Development Goals in Each Sector	3. Contribution to Redress the International Trade Balance	⑥ Lack of Diversification on Fish Export Products and Under Developed High Value Added Products	Basic Concept 3: Sustainable Development of Fish Exports	3.1 Implementation of Market Survey on Tanzanian Fish Product 3.2 Strengthening of the Competitiveness of Export Product by Improving Quality Control Capabilities	10 National Fish Export Promotion Programme 11 Lake Victoria Major Landing Beach Improvement Programme
	4. Contribution to the Poverty Reduction through the Fisheries Community Development	⑦ Lack of Technology on Development of Fishing Community by Self-help	Basic Concept 4: Reduction of Poverty and Improvement of the Livelihood in the Fisheries Communities	4.1 Fostering of Fisheries Community Organizations and Improvement of Institutional Capabilities of Fishing Villages 4.2 Mobilization of the Economic Activities of Fishing Villages 4.3 Women's Economic Activities Encouragement 4.4 Social Infrastructure Improvement in Communities	12 Fisheries Communities Development Programme
		⑧ Weak Financial Base of the Local Government for Fisheries Development ⑨ Inefficient Administrative Services	Basic Concept 5: Efficient Administrative Services and Financial Management	5.1 Improvement of Training and Extension Services by Rehabilitation of Fisheries Training Institutes 5.2 Strengthening of Experimental Study Functions and Technological Development at Training Institutions 5.3 Establishment of Fisheries Development Fund 5.4 Multi-sectoral Cooperation Promotion at District Level 5.5 Construction of New Fisheries Division Headquarters Building	13 Fisheries Information System Improvement Programme 14 Fisheries Training Institute Improvement Programme 15 Fisheries Master Plan Implementation Training Programme

5-5

2 OVERVIEW OF THE FISHERIES SECTOR

Basic Data

Land Area	886,037 km ²
	Latitude 1 to 11 degrees South and 30 to 40 degrees East
Population	33.95 m, Year 2000 (UNFPA)
	46.69 m, Year 2012 (UNFPA estimation)
Major Water Body	
Coast line	800 km
EEZ	223,000 km ²
Lake Victoria	68,800 km ² of which 35,090 km ² is in Tanzania.
Lake Tanganyika	32,945 km ² of which 13,510 km ² is in Tanzania.
Lake Nyasa	28,000 km ² of which 5,320 km ² is in Tanzania.
Others	Lake Rukwa (2,850 km ²), artificial man-made lakes or reservoir, Mtera Dam (580 km ²), Nyumba ya Mungu Dam (100 to 180 km ²)
Fish Production	328,813 tons (1996)

2.1 General Situation

Tanzania is well endowed with water resources as well as agricultural resources of arable land and also mineral deposit of gold. The country has a coastline of 800 km and narrow continental shelf (mostly 7 to 20 km). Inland resources of fishing include three African Great lakes, with a total of about 64,000 km². Lake Victoria, which is the second largest lake in the world is the predominant water body, covering 68,800 km² (35,090 km² or 51 % on Tanzanian side) and supplies about half of the fish to the country. The economy has traditionally depended on agriculture and its export. Agriculture sector contributes nearly half of GDP, about 40 percent of export earnings and also provides a livelihood for about 80 percent of the population. It is a common feature that farming is integrated with fisheries in fisheries communities. Fishers are often farmers at the same time, and own 1 to 2 ha of farming land.

The government has made progress in macroeconomic stability since early 90s. The government's objectives under the "Government Development Vision 2025" is to raise GDP growth to 8 percent with the "Poverty Reduction Strategy Paper" targeting a reduction of population under poverty line from 48 percent to 24 percent by 2010. The real growth rate of the Gross Domestic Product (GDP) in 1999 was 4.8 percent, an increase over the 1998 GDP of 4.0 percent. However, population under the poverty line still exceeds half the total population and is still increasing, making poverty alleviation a national issue.

During 1996, the total fish production was 328,813 tons, with over 80 percent coming from the inland water and/or 99 percent from artisanal fisheries sector (Fisheries Division, 1996). The quite high ratio of artisanal fisheries in Tanzania is a consequence of relatively small resources and also government policy. Presently, to protect artisanal fishers, fishing activities of the Nile perch processing plants are prohibited at Lake Victoria, and only 23 prawn trawlers have been granted licenses on the Indian

Ocean. There are 102,527 full time fishers and 30,171 traditional boats. Motorization of these small-scale boats is extremely low at 10 percent only. The contribution of the fisheries sector to the GDP in 1999 was 2.9 percent (Economic Survey, 1999).

The statistics on fish resources are not reliable, but the available information indicates an allowable catch of 730,000 tons. During 1980-90, there was a gradual increase in fish production from 150,000 tons to 300,000 tons. However, since 1990, Tanzania's fish production has reached a plateau and major stocks at fishing grounds near fisheries community are fully exploited and further increase has to come from exploitation of outer-sea resources or further fishing grounds. The production peaked at 350,000 tons in 1996 and 1997, but declined to 310,000 tons in 1999 and 320,000 tons in 2000. This recent drop in fish production is largely attributed to the stagnant production levels of inland fisheries. Aquaculture is one of the principal factors to meet future additional demand for fish, but still its production is negligible.

A breakdown of the fish production volume (1990-1996) according to regions shows that 48 percent of the volume was harvested from Lake Victoria, followed by 20 percent at Lake Tanganyika, 15 percent by marine fisheries, and 9 percent at Lake Nyasa. There have been no major changes in this composition in recent years.

Among the species caught, Nile perch (*Lates niloticus*), Dagaa (*Stolothrissa tanganyicae*) Tilapia (*Oreochromis niloticus*) and Migebuga (*Lates mariae*) are dominant. Lake Victoria fisheries have a significant socio-economic role in Tanzania, contributing 159,220 tons (49.2%) to total fisheries production in 1996. The steady production growth since early 1980s was dominated by the Nile perch, the production of which increased sharply during late 80s to early 90s. At present Nile perch accounts for 38 percent of the total Tanzanian fisheries production and 90 percent for fish exports.

Of the total fish production in Tanzania, it is estimated that 63 percent is used in various forms for human consumption, 30 percent for export and 8 percent for animal feed or non-food use. As food fish, there is strong preference for fresh fish and consumed mainly at fish landing area and its neighbouring towns, the remainder being processed into traditional product by drying, smoking or salting. Small Cyprinide and Clupeid fish "Dagaa" is largely processed into fish-meal used for chicken feed.

2.2 Contribution of the Fisheries Sector to National Development

(1) Contribution to Food Security and Nutrition

At present, Tanzania is a net export country of fishery products. They are one of the potentially self-sufficient food items and fish is a preferred source of animal protein. The per capita fish consumption volume is estimated at 5.9 kg/year and nutritionally, it comprises 32.7 percent of the animal protein consumption of the populace. In contrast to the average value of 16 percent for the entire continent of Africa or 9.4 percent of the animal protein intake of the adjacent country, Kenya, this is a high ratio. Due to cultural reasons and the undeveloped distribution system, fish products fulfil a high ratio of the nutritional demand of the urban and particularly, the coastal regions since fish consumption is limited in the inland areas.

According to PRSP, 43 percent of all children under the age of five in Tanzania are under height, and stunted, of whom 18 percent are severely undernourished. The daily nutritional intake is 1,940 kcal in Tanzania (FAO, 1999), which is greatly below the average for Africa (2,411 kcal). One of the major causes is attributed to the low animal protein intake of the country (average value in Africa 12.3g/day

vs. 9.8g/day in Tanzania). Adequate nutritional intake is the basis for sound health; and the improvement or deterioration of fish culture in Tanzania will have a major economic impact on the nation's health care burdens.

Tanzania Food and Nutrition Research Centre has assessed (in 2000) the nutritional value of various food including several fish product, which is calculated as energy and protein purchased at Tsh.100. The finding showed that Dagaa from Lake Victoria is the most cost effective, with highest value of 200 points as a potential energy and protein source. Consequently, increased consumption of Dagaa, which has been recognized as a very economical food source, will contribute greatly to improving the national nutritional intake. Therefore, it is extremely vital for the national economy to resolve issues such as developing a distribution system for Dagaa and other economical fishes, and promoting the consumption of fish in the remote areas.

(2) Contribution to the Protection of the Marine Environment

Sustainable development of the fisheries sector largely depends on the condition of marine environment and its ecosystem. An important role of fisheries sector is to monitor and protect the environment through the implementation of fisheries emphasising resources management.

(3) Contribution to Redressing the International Trade Balance

One of the government's main economic policy goals, as outlined in PRSP, is to achieve macro-economic stability through the improvement of present trade balanced. In 2000, Tanzanian trade balance is still negative with a trade deficit of US\$7 billion (export US\$6.6 billion, vs. import US\$15.4 billion). Tanzanian export is constrained by its structure, which depends on traditional agriculture products. In 1999 the overall sales of traditional export products such as coffee recorded a decline of 8.1 percent or US\$521 million from the previous fiscal year. The government should identify priority in the area of non-traditional product for further export promotion. The export of fish products had averaged a rapid growth of 10 percent since 1990 and had become an important export product comprising 12.3 percent of the total export value in 1998. The total export value in 2000 was US\$75.5 million and it has continued to maintain a large growth rate which has established fisheries as a major export item of the country. The government also earned substantial tax revenue (Royalty) from fish export, with US\$4.6 million in 2001. These are considered to be very important sources for the fisheries policy implementation.

(4) Contribution to the Poverty Reduction through Fisheries Community Development

According to the fishery census of 1995 and 1998, there were 968 fish landing sites scattered throughout the country, which signified that a fishing village was located about every 4km along the coastline of major water bodies. Many of these villages were often located in isolated areas where the other industries are limited. Hence the fishery is a valuable source of employment and maintains equilibrium within the country.

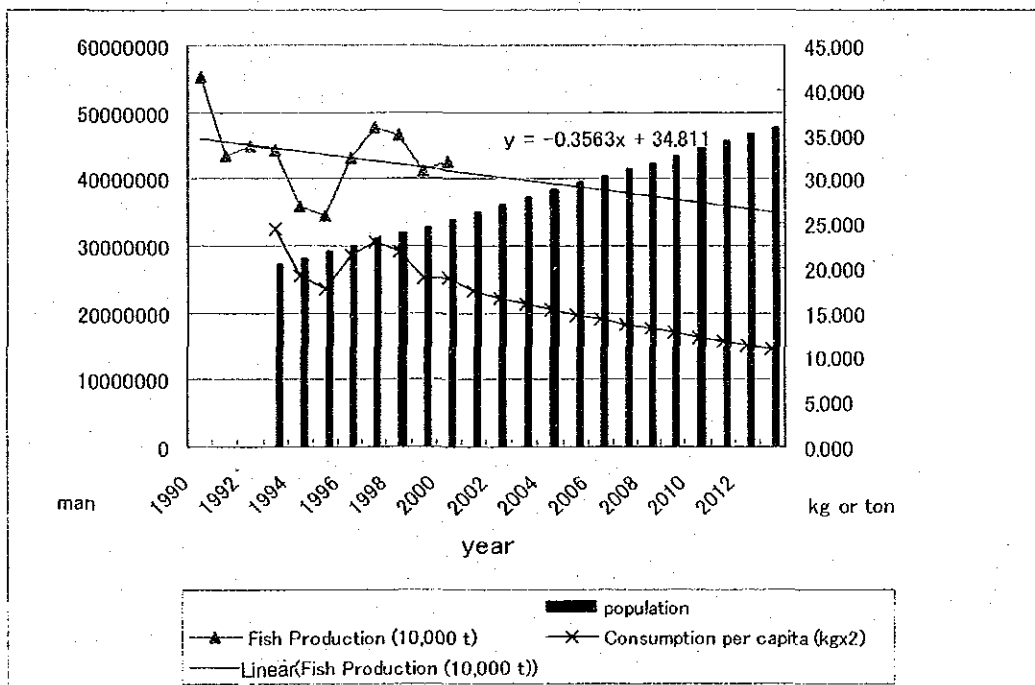
2.3 Issues of Fisheries Sector

The issues of the sector are summarized into the following 9 categories, according to the fisheries roles above mentioned.

Role of the Sector to the National Development	Issues of Fisheries sector
(1) Contribution to Food Security and Nutrition	<ul style="list-style-type: none"> Stagnant Fish Production, which cannot Meet Population Growth Undeveloped Fishers Organization High Post Harvest Loss and Opportunity Loss of the Fresh Fish Trade, which deprives Fishers of Better Incomes High Fish Prices and Large Disparities in Prices among the Production Sites
(2) Contribution to the Protection of the Marine Environment	<ul style="list-style-type: none"> Poor Co-management System on Fish Resources
(3) Contribution to Redress the International Trade Balance	<ul style="list-style-type: none"> Lack of Diversification on Fish Export Products and Under Developed High Value Added Products
(4) Contribution to the Poverty Reduction through Fisheries Community Development	<ul style="list-style-type: none"> Lack of Technology on Development of Fisheries Community by Self-help
	<ul style="list-style-type: none"> Weak Financial Base of the Local Government for Fisheries Development Inefficient administrative services

(1) Stagnant Fish Production, which cannot Meet Population Growth

Fish production in the last decade in Tanzania has continued to stagnate after peaking in 1996 and 1997 at 350,000 tons, dropping to 310,000 tons in 1999 and 320,000 tons in 2000. In contrast, fish demand has grown in conjunction with a population growth rate of 2.7 percent. Subsequently, the per capita fish consumption volume of 12 g in the 1980s, is surmised to have decreased by 50 percent. The decreased fish supply has seriously impacted the health of the people, and there is concern that this will increase social insurance expenditures.



Sources: Population: UNFPA, Fish production in 1990-1996: Ministry of Natural Resources and Tourism 1990, Fish production after 1996: Estimation by members of Master Plan

Estimated Consumption per Capita in 2011

(2) Undeveloped Fishers Organization

To increase fish production, the technical knowledge and productivity of the artisanal fishers must be improved. For artisanal fishers who do not have enough capital to invest in modern or large scale fishing inputs, organizing fishing and marketing activities will be the best or only means to improve the productivity of the artisanal fisheries. It is also an important means of raising the incomes of the economically weak artisanal fishers. However, the cooperatives' activities have stagnated and a large scale cooperative union does not exist in the sector. Despite the transition from a socialist to a free economy in the 1990s, the meagre business experience of the private sector, the undeveloped business skills and mindset, have impeded the development of fishery business and organizations. In addition, the strong socialist dependence on government institutions and the management failures of the cooperatives has produced a strong resistance against joint business activities, which also hampered the growth of fishery cooperatives. The issues that must be addressed to structurally strengthen fishery cooperatives are: a) lack of capital, b) small scope, c) low management capabilities/low educational background, d) low reliability, and e) frail system of assistance.

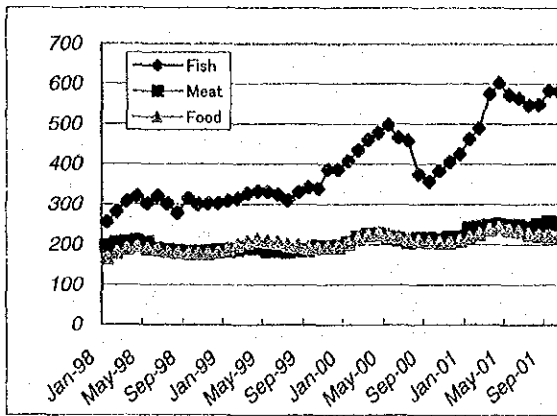
(3) High Post Harvest Loss and Opportunity Loss of the Fresh Fish Trade, which Deprives Fishers of Better Incomes

Reducing post-production losses offers an important means of increasing the real food supply without increasing the fish production volume. In Tanzania, one of the greatest post harvest losses occur during the processing of Dagua in the rainy season. Dagua are usually sun-dried and this process takes 1 to 2 days under fine weather. But during the rainy season, it is quite difficult to dry before the raw material deteriorates, due to the rain. The lack of means to dry Dagua artificially or to store the fish in cold storage is the constraints of Dagua processing. Post harvest loss of Dagua Kigoma (from Lake Tanganyika), which is an economical important fish species comprising 15 percent of the total fish production volume of the country, has serious impact not only on reduction of the artisanal processors' income, but also on the stability of the nation's food supply.

In Tanzania, fish processing serves as a means of fish preservation and it is not a means to add value to the fish product. Fresh fish is preferred and normally has higher price. In contrast with fresh fish, there is about 40 percent loss in price when the fish is sold as a salted and dried product. Artisanal fishers with only access to small fish market and who has to process remaining unsold fresh fish, have suffered revenue loss.

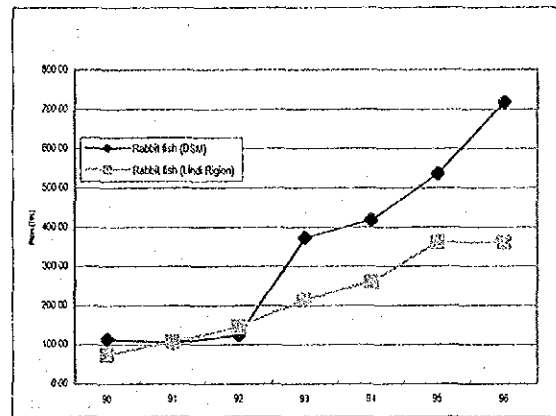
(4) High Fish Prices and Large Disparities in Prices among the Production Sites

According to the consumer price index (National Statistics Bureau; 1994=100), fish prices increased sharply during the past 10 years, from 256 in January 1998 to 581 in October 2001. These figures greatly exceeded the other consumer food index for general food products of 219 (October 2001) and meat of 252 (October 2001). In contrast, the fish price at production sites, where do not have good access to urban markets, is only one-fifth to one-third the price of fish sold at the city fish markets. The per capita production volume of fishers in many of the regional fishing villages is small; and the non-existence of cooperatives and subsequent lack of a joint shipping system has made shipments to urban areas difficult. Consequently, appropriate pricing of fish products does not exist.



Source: National Statistics Bureau

Price Change in Fish, Meat & Food '98-01
(1994=100)

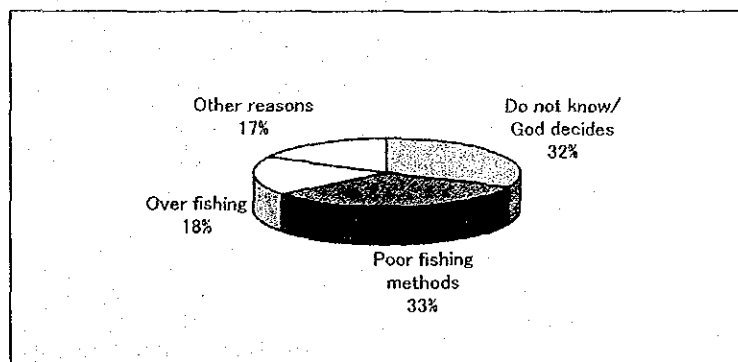


Source: National Statistics Bureau

Price Change in Rabbit fish '90-96

(5) Poor Co-management System on Fish Resources

Although surveys to determine the resource volume of major water bodies in Tanzania have been conducted, it has not reached a stage where resource management such as TAC (Total Allowable Catches) or MSY (Maximum Sustainable Yield) can be applied. The number of government staffs are too few to monitor the large water bodies, necessitating the need for fishers' participation as key actors in resource management. However, fisher awareness about fishery resources is low, and they are strongly resistant to fishing licence restrictions or limitations to fishing grounds. A foundation for independent management activities is nonexistent. In Lake Victoria, a fisheries management plan has been implemented and BMUs are being organized. Unfortunately, the lack of fisher identity and understanding about resource management has hampered efforts to establish an effective organization.



Source: Lake Tanganyika Research

Reasons Given for Production Decrease

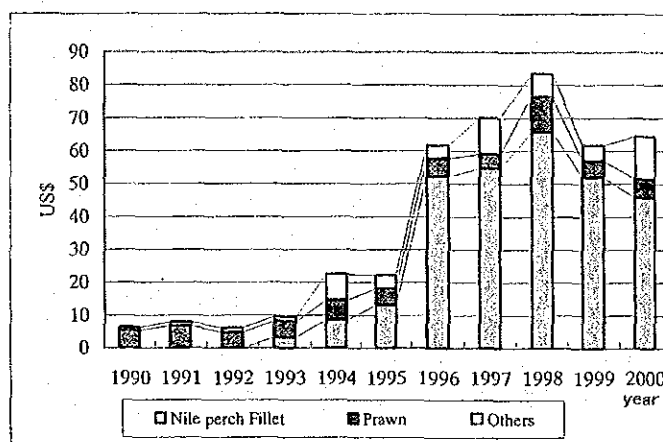
(6) Lack of Diversification on Fish Export Products and Under Developed High Value Added Products

The production of Nile perch exports, which comprise 90 percent of Tanzania's fish export has stagnated its volume, despite investments made by export companies. The core commodity of the Nile perch export is fillet product. The export of other parts of the Nile perch such as the bladder, other than

the Nile perch fillet has contributed to increased export revenue, in recent years.

The result of the recent study on the fish stock and other indicators suggest increasingly small fish size and that export volume is not anticipated to grow in future. Measures to promote exports will thus have to shift from volume to quality, but such measures have been lagging in Tanzania.

The export market which is centred in the EU will force Tanzania to strengthen its production to shipping process to incorporate EU quality control standards based on HACCP and ISO9000s. Paved sorting areas, toilets, and other sanitary facilities that are lacking in Tanzania are needed to prevent fish products from sand and soil pollution during fish transactions that are conducted at the fish landing beaches.



Source: TRA

Changes in Fisheries Export Value between '90-00 by Products

(7) Lack of Technology on Development of Fisheries Community by Self-help

The development budget for production and social inputs is extremely scarce for the fishing villages, and they depend heavily on the central government's support for community development activities. To reduce poverty and its incidence on fisheries communities, it will be necessary to support them by self-help at community level. A system of residents participation to resolve village issues remains inadequate; therefore, the capabilities of the village leaders are important to the community's development. However, in many cases, the leaders have not had adequate opportunities to receive training in development methods to utilize and manage resources and to alleviate poverty. In addition, access to fishing and processing technology is quite limited.

Major Negative Factors for Fisheries Community Development

1. Weak fisheries extension services
2. Un-established method and know-how for the organizing of the fishers and community development
3. Low education level of the fishers
4. Poor social and economical infrastructure in the community

(8) Weak Financial Base of the Local Government for Fisheries Development

Tax revenue from fisheries sector is a very important source for the local government to implement their services to the sector. However, it is extremely difficult to accurately grasp the small fishing villages that are subject to taxation due to their dispersal, and it is difficult to adequately collect taxes due to the shortage of government staffs. In order to provide the government services and to collect tax efficiently, a number of small fish landing sites should be strategically centralized according to their geographical and marketing advantage. At the moment, landing site identified by Fisheries Division do not have any grade. Responsible fisheries management and services that meet fishers' needs cannot be provided by the financial resources of the districts. There is a large disparity between the fishery revenues of the central government at US\$5 million, and Mwanza and Dar es Salaam, which has many independent financial sources totalling US\$100,000 to US\$300,000. Hence a new system of financial assistance from the central Fisheries Division must be created, in conjunction with the districts' efforts to secure stable, independent financial sources.

(9) Inefficient Administrative Services

The inadequate placement of government staffs and their low level of motivation have contributed to inefficient administrative management. There are currently 59 general staff members employed at the Fisheries Division headquarters, but only 19 fisheries officers have bachelor's degree or higher. It is difficult to implement a myriad number of administrative tasks in an inefficient working environment with inadequate office automation facilities. Despite regional reforms and a reduction in a large number of fisheries extension personnel, retraining programmes for district officers have been extremely limited, and this has lowered the quality of the services that is provided. Additionally, the district fisheries officers and extension personnel are under the direct management of the DED. Subsequently, the work of the extension personnel shifted from supervising fishery activities, data collection and extension activities to tax collection activities that directly affect the district government.

3. BASIC DEVELOPMENT CONCEPT AND STRATEGY

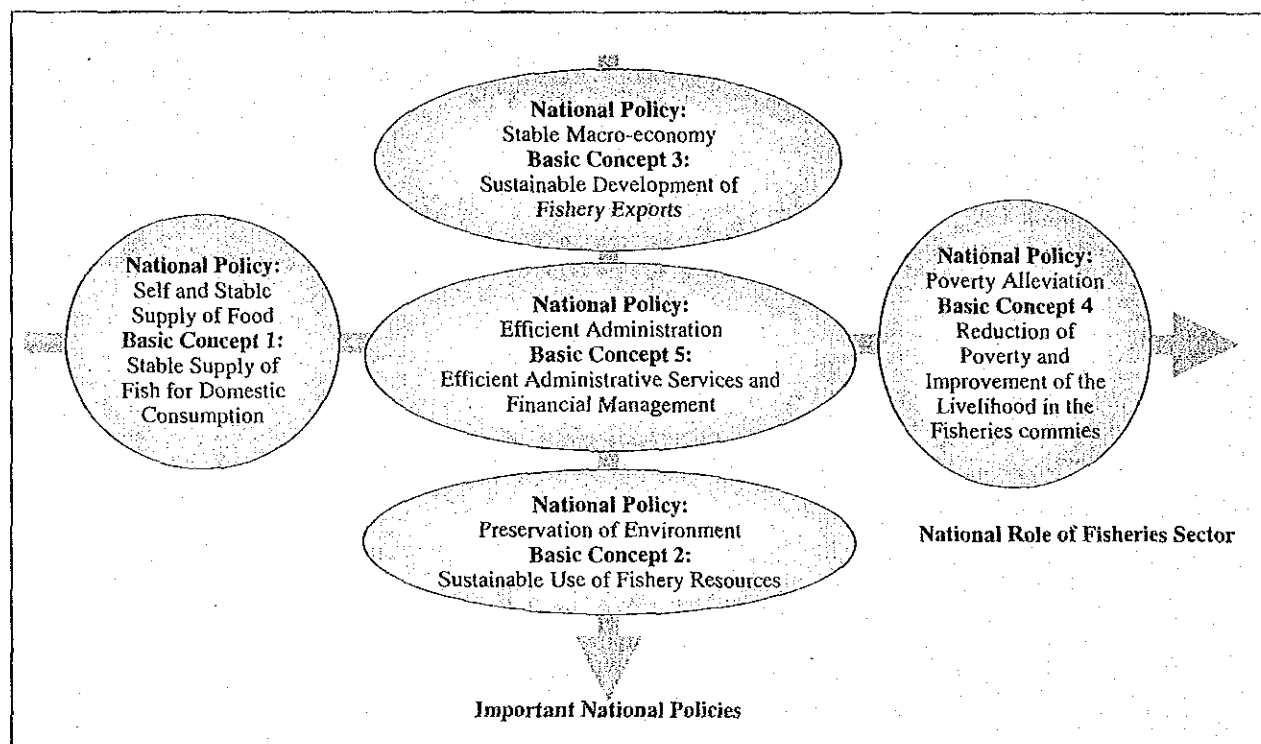
3.1 Development Objectives

The objectives of this Master Plan are to strengthen the capacities of the development of artisanal fisheries in both the public and private sectors; and thereby, the sector could contribute to the national economy, in terms of the nutritional intake of the populace, and raise the livelihood and social welfare conditions of the rural fisheries communities.

3.2 Structure of the Master Plan

This Master Plan consists of "Basic Concepts", "Development Strategies" and "Priority Programmes". Basic concepts for fisheries development aim to solve the 9 issues in the sector explained above and suggest the direction for the future fisheries development. For the planning of the basic concepts, consistency between national development policies and fisheries development are taken into consideration. These basic concepts are:

- Basic Concept 1: Stable supply of fish for domestic consumption to improve the general nutrition of the country
- Basic Concept 2: Sustainable use of fishery resources through optimal utilisation of resources
- Basic Concept 3: Sustainable development of fish exports to earn foreign exchange
- Basic Concept 4: Reduction of poverty and improvement of the livelihood in the fisheries communities
- Basic Concept 5: Efficient administrative services and financial management



Basic Concepts in Relation to National Policies

B.C.1: Stable Supply of Fish for Domestic Consumption

D.S.1.1 Strengthening Fisheries Cooperatives/ Organizations

D.S.1.2 Improvement of Fishing Technologies and Extension

D.S.1.3 Reduction of Post Harvest Losses and Promotion of the Fish Utilisation by Shifting from Non-food to Food Purposes

D.S.1.4 Reduction of Marketing Costs and Development of Fish Distribution System

D.S.1.5 Implementation of Feasibility Survey on Aquaculture and Establishment of a Development Model

B.C.2: Sustainable Use of Fishery Resources

D.S.2.1 Strengthening of Fishers Organizations for Resource Co-management

D.S.2.2 Publication of Fisheries Statistics (1997-) and Preparation of Effective Data Processing System

D.S.2.3 Implementation of Monitoring on Fisheries Activities and Collection of Biological Information on Catches at Major Landing Sites

B.C. 3: Sustainable Development of Fish Exports

D.S.3.1 Implementation of Market Survey on Tanzanian Fish Product

D.S.3.2 Strengthening of the Competitiveness of Export Product by Improving Quality Control Capabilities

B.C. 4: Reduction of Poverty and Improvement of Livelihood in the Fisheries Communities

D.S.4.1 Fostering of Fisheries Community Organizations and Improvement of Institutional Capabilities of Fishing Villages

D.S.4.2 Mobilization of the Economic Activities of Fishing Villages

D.S.4.3 Women's Economic Activities Encouragement

D.S.4.4 Social Infrastructure Improvement in Communities

B.C. 5: Efficient Administrative Services and Financial Management

D.S.5.1 Improvement of Training and Extension Services by Rehabilitation of Fisheries Training Institutes

D.S.5.2 Strengthening of Experimental Study Functions and Technological Development at Training Institutions

D.S.5.3 Establishment of Fisheries Development Fund

D.S.5.4 Multi-sectoral Cooperation Promotion at District Level

D.S.5.5 Construction of New Fisheries Division Headquarters Building

B.C.: Basic Concept, D.S.: Development Strategy

Basic Concepts in Relation to Development Strategies

3.3 Basic Concept and Strategy to Develop Fisheries

Basic Concept 1: Stable Supply of Fish for Domestic Consumption

Fishery products are an important source of protein for the Tanzanian people. The fish demand as domestic consumption in 2012 is estimated at 280,000 tons, or about 80,000 tons higher than the current demand, due to a projected population growth of 37 percent from 2001 levels. Presently, the self-sufficiency ratio is 100 percent. To fully utilize fishery resources, production must be increased in combination with the development of aquaculture and fish imports. Furthermore, to ensure that the harvested fish is not wasted and rational consumption is promoted, the accelerated development of fish processing and marketing will be targeted and integrated with the task of securing the minimal volume of food supply needed to meet the demand of the populace.

Development Strategy 1.1 Strengthening Fisheries Cooperatives/ Organizations

Existing fisher organizations will be categorized. There are two types of fisher organizations in Tanzania. The first is the general fishery cooperatives that are mainly comprised of boat owners and conduct or aim to conduct diverse activities, including credit activities. The second type is small, specialized groups comprised of members who jointly operate one purse seiner. In many cases, the latter type has not been officially registered as a fisher organization. As fisher organizations are voluntarily organized by fishers, its operations should adequately incorporate their ideas and intent; and its potential as an organization should be strengthened according to category, activities and scope.

In the case of general fishery cooperatives, technical guidance, support to strengthen the organization's operations, and financial support will be provided to model cooperatives that meet specific criteria in terms of capital, number of members, etc. Large organizations with more than 300 members will be able to purchase certain equipment and materials, depending on the membership fees and capital collected from members. In contrast, the disadvantage of general fishery cooperatives is the fact that mutual trust decreases as the number of members increases, and the cooperative's active contributions are directly related to the strong leadership capabilities of the executive members of the organization. Therefore, educational support for the executive members in the area of organizational operations, activity management, and others are essential. Additionally, support will be provided to expedite the cooperative's SACCOS activities, activity programme formulation, long-term loans, and others.

In the case of small fishery cooperatives, technical guidance for activity operations aimed at raising the efficiency of the organization's activities is needed. To spur collaborative relations between specialized fishery cooperatives, a model project targeting fishing operations using a jointly operated fishing vessel will be formulated at the district level.

An important goal of fishers' cooperatives, especially young fishers and boatmen who are unable to purchase fishing gear, is to provide a solidarity guarantee for loans. The national government will support measures to strengthen a credit system for small cooperatives to enable them to set up a financial system to purchase fishing equipment and materials and to provide the fishing village access to private sector loans. Additionally, the fishing technology of cooperatives comprised of young fishers and boat owners is undeveloped in many cases, and assistance measures to improve their technical skills are needed. The traditional educational system of the fishers will be reviewed; and cooperatives and a systematized organization, that will enable technical transfer activities to be carried out by fishers, will be fostered to enable artisanal fishers to participate in drafting and assessing fishery policies through their representatives.

Development Strategy 1.2 Improvement of Fishing Technologies and Extension

Each fishery law currently in effect in Tanzania requires major or minimal reforms. A trial project with the cooperation of the fishers to improve purse seine and long-line fishing technology will be conducted in conjunction with the Master Plan and extension activities.

Development Strategy 1.3 Reduction of Post Harvest Losses and Promotion of the Fish Utilisation by Shifting from Non-food to Food Purposes

Measures to raise the ratio of Dagaa as a fish food product will be pursued. The Dagaa is a small pelagic fish that is produced in the marine waters and the three major lakes of Tanzania. In particular, Dagaa Kigoma fish landed in Lake Tanganyika and Dagaa Mwanza fish landed in Lake Victoria have high marketability. Sun-dried Dagaa is the commonly marketed product, and production loss during the rainy season is especially high. Consequently, Dagaa that is generally consumed is poor in quality. Developing and improving the processing and marketing technology of Dagaa as a food commodity will contribute greatly to securing a stable domestic supply of fish.

A different approach is needed to improve the production of the two types of Dagaa, Dagaa Kigoma and Dagaa Mwanza, due to their dissimilar characteristics as a food product. The price of Dagaa Kigoma, which is an expensive, high-demand product, differs according to fish quality and ranges in price from US\$1.0 to US\$1.5/kg. Therefore, technical improvements will include introducing artificial drying techniques during the rainy season that will raise the product's general consumption as well as the profits of the artisanal processors. In the case of the lower-priced Dagaa Mwanza, the handling functions of the Kirumba fish market, where 90 percent of Dagaa Mwanza is marketed, will be improved to increase the absolute quantity consumed.

Supplementary products of the fisheries industry will be effectively promoted. Presently, the utilization rate of the Nile perch by the processing plants is 50 percent. The head, entrails, and backbone, that are discarded by the processing plants, undergo secondary processing by artisanal processors and are sold and consumed in the domestic and other African markets. These wastes will be 1) processed into high value added products by the processing plants and exported or marketed domestically at high quality food markets, and 2) the domestic market for processed products produced by artisanal processors will be expanded, after the processing technology and sanitary management at small-scale plants have been improved. As a result, the product development capabilities of the Nyegezi Freshwater Fisheries Training Institute will be strengthened. Measures to strengthen the cold storage and freezer facilities at major markets such as the Dar es Salaam fish market will also be expedited to effectively market small demersal fish that are supplementary products of prawn trawlers operating in the coastal region.

Development Strategy 1.4 Reduction of Marketing Costs and Development of Fish Distribution System

The national highway connecting Dar es Salaam and Mwanza, that will be completed in the next five years, provides a major advantage in transporting fresh fish from Mwanza. Consequently, the joint shipment of surplus fish produced at Lake Victoria will be promoted and marketing activities of Nile perch and tilapia to major cities will be expedited, in tandem with cost reductions in marketing. Presently, the majority of exported Nile perch (Tsh.700 to 1,000/kg, Dar es Salaam) are competitively viable with coastal fishery products. As a result, fresh fish marketing activities have already begun at some markets such as Kariakoo market. Diversification of the market in terms of developing of domestic market, shall be more promoted to secure the fishers sales. To efficiently ship fresh fish from the production sites, measures to organize the fishers and to provide cold storage facilities must be

carried out.

Furthermore, to ensure that marketed fresh fish is safe for consumption, guidelines on handling fresh fish will be formulated and disseminated to fish markets and fish retailers, in conjunction with measures to improve quality control management and water sanitation standards at fish landing facilities and fish markets.

Development Strategy 1.5 Implementation of Feasibility Survey on Aquaculture and Establishment of a Development Model

Farmers normally are cautious about engaging in aquaculture due to the initial cost of construction ponds, fish mortalities, theft, and other inherent risks. One means of effectively changing the conservative mindset of these farmers is to foster aquaculture guidance farms by setting up a model fish culture farm where farmers can experience firsthand the profits generated from aquaculture activities. Aquaculture activities in Tanzania are presently limited to a few areas in Ruvuma, Morogoro, Lindi, and Mtwara regions. Therefore, an effective strategy is to conduct extension activities in these areas, where the existing aquaculture farms can serve as guidance farms. The economic viability of the NADC's trial aquaculture project based on private sector consignment and use, and the subsequent results will be made public.

Aquaculture extension activities will target 1) composite agriculture aimed at achieving self-sufficiency, 2) commercial aquaculture, and 3) seedling production. Criteria such as water resources for aquaculture use, soil suited for culture activities, and marketing routes for cultured fish will have to be adequately surveyed and confirmed prior to the start of these activities. The training programme and equipment and materials will be provided based on the training needs and the technical levels of both the extension personnel and the farmers who will undergo training in aquaculture technology.

Basic Concept 2: Sustainable Use of Fishery Resources

The cornerstone of Tanzania's fishery policy is to sustain and manage its fishery resources and to develop resource management based fisheries that will ensure the sustained use of its fishery resources. Some of the resource management measures that have been pursued are regulated management of fishing grounds, controls on harvested fish species, regulated production volume, and others, but due to the enormous land area within its national boundaries and the approximately 1,000 fisheries communities dispersed throughout the country, the effectiveness of external government agencies to oversee individual fishing activities is limited. Hence the hitherto adopted procedure of enforcing external controls in fisheries must change to a system of controls and regulations based on voluntary, self-enforced co-management by fisheries communities and fisher organizations.

Development Strategy 2.1 Strengthening of Fishers Organizations for Resource Co-management

A nationwide co-management system of fishery resources conducted mainly by fishers will be developed. It will be difficult to solicit the independent participation of fishers in such a system unless it is tied to resource usage rights. Although the Tanzanian government requires all fishers to register, a system of fishing rights that regulate exclusive fishing operations in specific water areas or fishing licenses that regulate different types of fishing operations do not exist. The rights of fishers have not been secured and this has greatly impeded the active participation of fishers in resource co-management activities. As a result, establishing fishing rights and regulations on fishing operations must be enacted in tandem with the task of educating fishers in resource management. Thus an

immediate task of the Fisheries Division is to create fishing laws governing fishing rights.

The main body that will implement fishery management activities will be the fishery cooperatives, the BMU, or other new fisheries community organizations. It is important that the entire fisher community in the region participate in regional fishery management. However, organizations that meet the criteria are nonexistent at present. Hence measures to strengthen the resource management capabilities of these three parties will be implemented during the ten-year Master Plan. Therefore, it is important to achieve a record of successful cases in regional fisheries according to respective fishing characteristics. Although more than 600 BMUs have been organized at Lake Victoria by the government administration since 1997, the majority are no longer in operation. A survey study to assess the conditions of the BMU currently in operation will be implemented, and efforts to clarify their legal status and functions will be carried out. The BMU has been managing the fishers in lieu of the government. However, it should be noted that they have not evolved sufficiently to implement fishery management activities.

Short-term training programmes in resource management education for fisher organizations and BMU will be implemented by institutions that will visit fisheries communities to provide leadership training programmes. The knowledge and technology needed to cope with environmental conservation, sanitation control, quality control, identifying poison fish, trawling nets, and other existing issues will be strengthened. In addition, training courses in organizational operations, problem-solving methods, and measures useful for establishing an organization will also be included.

To implement an independent and self-reliant system of co-management by the fisheries community and fisher organizations, the fishers must possess an awareness of the fishing environment and resources (arouse their interest and deepen their understanding). Therefore, a model environmental programme will be developed for the fisheries communities and environmental education will be included in the fishery development project that will be implemented. It is particularly important that the environmental education programme focus on fostering leaders and the next generation of young fishers who will be able to play a major role in implementing environmental conservation activities.

Development Strategy 2.2 Publication of Fisheries Statistics (1997-) and Preparation of Effective Data Processing System

The existing fishery information processing system (TANFISH) will be reviewed and improved. The annual fishery statistics, that have not been published since 1996, will be supplemented by estimated values and promptly published. To accomplish this task, the statistical data processing equipment of the Fisheries Division will be replaced and simultaneously, a training programme will be implemented for the personnel in charge of statistics at the Fisheries Division and at the regional level. To increase the accuracy of fishery statistics, the sampling method used at the landing sites must be reassessed. The Fisheries Division in collaboration with the Local Government Management will have to develop a mechanism to collect data from the landing sites to get actual information on fishery statistics from all resources. The prevailing conditions and the primary processing capabilities of the fish landing sites that are presently designated as data collection points will be reviewed.

Development Strategy 2.3 Implementation of Monitoring on Fisheries Activities and Collection of Biological Information on Catches at Major Landing Sites

With the cooperation of the artisanal fishers (boat owners) and fishery cooperatives, biological data on landed fish at major landing sites will be collected. As data on harvested fish (the length, etc.) is presently collected at Lake Victoria by the LVEMP, a survey system on economically important fish species in Lake Tanganyika and the coastal area will be established. Banda beach new fish market

could be the most suitable station for data collection on the coast. The market should be facilitated for data collection and its processing. A contract to measure the harvested fish will be signed with boat owners; and fishing nets, GPS unit, fish sensors will be leased to boat owners and training programmes for fishers will be provided.

Basic Concept 3: Sustainable Development of Fish Exports

Fishery exports in Tanzania comprises more than 10 percent of the country's foreign currency. The growth of traditional export products such as coffee and raw cotton has stagnated due to a surplus supply in the international market. As the global demand for fishery products is anticipated to continue, developing and sustaining fishery exports as the mainstay foreign currency earning industry is an important strategy in terms of the macro economy. In addition, the royalties (export tariffs) generated by fishery exports will be an important financial source for the Fisheries Division in future, due to the central government's policy that will allow the ministries and agencies to possess an independent financial source. Therefore, stable fishery exports must be achieved.

Development Strategy 3.1 Implementation of Market Survey on Tanzanian Fish Product

A market survey on major fishery export products of the advanced nations - Nile perch, prawn, seaweed, and aquarium fish--will be conducted to collect information on market trends and export related systems and to disseminate this information to export companies. An evaluation analysis of international market demands and Tanzania's products will be made, and an export strategy aimed at reducing production and marketing costs and expediting stable product quality will be drafted. In particular, the raw supply of Nile perch, which comprises 90 percent of the total export volume, is not expected to drastically increase due to resource restrictions. Therefore, in addition to the processed fillet product, an increase in value added processing such as seasoned or fried products must be targeted to raise export values. Therefore, the trial development of new products will be implemented with the cooperation of the processing cooperatives and the Nyegezi Freshwater Fisheries Training Institute; and a market survey of Europe, Asia, and North America will be implemented.

A distribution and marketing survey on the regional marketing of Dagua will be conducted (particularly Democratic Republic of Congo) to ascertain the export volume that is not officially known at present. Although the official export volume statistics for Dagua Kigoma, the high demand food fish, is 500 tons in 2000, an export volume exceeding this figure by tenfold is exported mainly to the Democratic Republic of Congo. This export activity does not pay royalties or export tariffs, and therefore, it is believed to be illegal. To meet the increased domestic demand in future, the domestic demand for Dagua must be raised. An export strategy that includes the collection of tariffs will be drafted based on the market survey findings.

Development Strategy 3.2 Strengthening of the Competitiveness of Export Product by Improving Quality Control Capabilities

Sanitation standards and control based on HACCP and ISO 9000 methods will be pursued to ensure the safety of fishery export products, and a quality control testing laboratory in Mwanza and Dar es Salaam will be established. To strengthen the system to address the pollution of fishery resources caused by the gold mining industry, industrial waste water, and agricultural pesticides, the capabilities of the laboratory to analyze mercury, cyanide compounds, pesticides, and other substances will be enhanced. Further, coordination with related ministries and agencies will be targeted and comprehensive pollution countermeasures to improve the water quality will be pursued.

Basic Concept 4: Reduction of Poverty and Improvement of Livelihood in the Fisheries Communities

The fishing villages are the focal centre regarding fish production activities and livelihood of the fishers and their families. Therefore, comprehensive measures aimed at developing the fishing village economy, improving the living environment and welfare activities must be implemented. To reduce the poverty of fisheries communities, it will be necessary to support fishers at the grass roots level, with the participation of fishers, district staff, NGO, etc. However, the key is fisher's active participation to improve their livelihood by themselves. The approaches should focus on the capacity building of the fishers to assess the condition of their communities and how to solve their problems.

Development Strategy 4.1 Fostering of Fisheries Community Organizations and Improvement of Institutional Capabilities of Fishing Villages

A micro project that will be implemented within the scope of the fishing villages and aimed at strengthening the joint functions of the villages, will be supported technically and financially. This project will be planned and implemented with the participation of village residents. The institutional capabilities of the village such as educating the fishing village leaders and strengthening the village meeting functions will be improved.

Development Strategy 4.2 Mobilization of the Economic Activities of Fishing Villages

Fish processing is the potential economic activities in most of the fisheries communities. Activities to increase value added processed fishery products and their distribution in the market to mobilize the economic activities of the fishing villages will be supported. The financial source of the village budget must be strengthened in order to improve the living environment and social welfare activities of the villages, and the cash economy of the villages must be stimulated. The villages are hampered by the lack of infrastructure such as electricity and transport that is needed to expand their fresh fish marketing activities. Therefore, processing the surplus fish will help preserve the fish for marketing, and the processed fish product will greatly affect profitability. Thus an effective means of achieving increased income is to produce specific high value added processed products for the market. TAFIRI and the experts from training institutions, in conjunction with the women of the fishing village are to develop and improve specific products for hotels and restaurants, as well as establishing antenna shops that promote mutual understanding between producers and consumers. These activities will assist the fisheries community's expansion into the market. The majority of the processing activities are carried out by women, hence management training for women processors will be conducted to improve their capabilities and to stimulate the participation of village women in economic activities.

Development Strategy 4.3 Women's Economic Activities Encouragement

Fish processing and its trading are major economic activities of women in the fisheries community. To promote their activity, appropriate training, which up-grade their business skill and technology will be provided.

Development Strategy 4.4 Social Infrastructure Improvement in Communities

Enlightening the importance of social public infrastructure, such as water supply, clinic, school, feeder road, etc. through the various workshops.

Basic Concept 5: Efficient Administrative Services and Financial Management

Achieving efficient administrative operations is fundamental to implementing policies efficiently. Due to the rapid regional decentralization that occurred in 1997, regional governments at the regional and

village levels are required to respond to the needs of fishers and fisheries communities. The independence of these autonomous bodies must be enhanced to enable them to fulfil their responsibilities and to further expedite administrative reforms. To achieve these goals, the role of the Fisheries Division, District fisheries office and other related institutions must be clarified; and the efficiency of administrative management will be pursued through adequate placement of staff personnel and measures to improve their capabilities. Presently, the major issue that must be addressed is the shortage of technical fishery staff at the field, compared to the staff in the government training institutes.

Development Strategy 5.1 Improvement of Training and Extension Services by Rehabilitation of Fisheries Training Institutes

The depreciated facilities and equipment of both the Nyegezi Freshwater Fisheries Training Institute and Mbegani Fisheries Development Centre will be replaced to enable both schools to provide practical and high quality educational services and to strengthen the re-educational opportunity for government fisheries officers. Additionally, an adequate budget must be procured for this re-educational programme. In view of the scope of domestic demand for vocational training in Tanzania, the scope of the existing training facilities and the necessity for two schools must be reviewed. The integration of the two schools, the development of a unified training programme, and the shared use of facilities are some of the measures that can be taken to reduce the operational budget of the training schools, while endeavouring to procure a budget for the re-educational programme for government officers.

The major fishing ground for the three East African countries of Tanzania, Kenya, and Uganda is Lake Victoria, and a mutual framework for fisheries management is being pursued. Hence it is surmised that the three countries share a common training need for fishers and government fisheries personnel. Presently, Kenya does not possess a fisheries training institution, and the fisheries training school in Uganda is depreciated and beset with problems. Therefore, regional cooperation for fisheries training activities should be promoted in conjunction with improvements that will be implemented for the Nyegezi Freshwater Fisheries Training Institute, and efficient education at the regional level should be pursued.

Development Strategy 5.2 Strengthening of Experimental Study Functions and Technological Development at Training Institutions

To achieve the integrated development of applied technology and training extension, the applied technical research and development functions of both the Nyegezi Freshwater Fisheries Training Institute and the Mbegani Fisheries Development Centre will be strengthened. Collaborating with the regional fishers to resolve the technical issues faced by artisanal fishers, will also serve to enhance the application of the education provided by the training schools. Therefore, a research panel (external organization) comprised of artisanal fishers, artisanal processors and distributors, will be established at the training schools; and the selection of study issues, drafting projects, and a system of evaluating findings will be created. Services that meet the needs of artisanal fishers will be provided.

Development Strategy 5.3 Establishment of Fisheries Development Fund

A National Fisheries Development Fund that is financially sourced by royalties will be established to secure a financial source to fund technical assistance for artisanal fishers and fishing village development. Fish landing tariffs paid by fishers and royalties generated by export processing companies are an important financial source for the fisheries administration. The amount generated from royalties alone was five million dollars in 2000. In contrast, government services for the private

sector in return for these tariffs have been unclear and unregulated. As a result, there is private sector distrust of the government. Therefore, a fund will be created using a portion of the royalties collected and financial assistance for the private sector will be provided and governed by uniform rules. A stable system that can be utilized by fishers must be created immediately. A Fisheries Development Assistance Committee will be created to evaluate the content and priority of projects requested for financial assistance and to ensure that the funds are efficiently managed. The key to the success of the National Fisheries Development Fund is the transparency of fund management activities. Therefore, academic societies, private companies, and the artisanal fisheries sector, in addition to the Fisheries Division will participate in the committee's activities.

Development Strategy 5.4 Multi-sectoral Cooperation Promotion at District Level

Cooperation between the high-level district fisheries officers, executive members of the cooperatives, and high-level agricultural government officers will be pursued in fisheries extension activities and fisheries community development at the district level. These government officers and executive cooperative members from different sectors are directly involved in technical extension activities and organizing villages. Hence educating these personnel in basic fisheries will increase the services for fishers. Since these three different sectors belong to the Economic Division at the district level, a combined team of these three groups can be easily formed by the division director as needed. Such teams will be especially effective in organizing cooperatives, aquaculture extension, and fishing surveillance activities. Therefore, the model of these multi-sectoral cooperation team consisting of fisheries officer, agriculture officer and cooperative officer will be established at the district which has the fish production centre; they will give the appropriate training for fisheries community development.

Development Strategy 5.5 Construction of New Fisheries Division Headquarters Building

The headquarters of the Fisheries Division is presently located in a segment of the Ministry of Land building. Therefore, the Fisheries Division's headquarters will be moved to a newly constructed office located in an extended lot of the Dar es Salaam fish market.