

VI EVALUATION

CHAPTER 6 EVALUATION

1 SOCIO-ECONOMIC EFFECTS OF THE MASTER PLAN

The development of the fisheries industry in Tanzania is dependent on measures to strengthen the capabilities of the fishers and organizations. Therefore, the 15 priority programmes that are aimed at strengthening the cooperative organizations and conducting fisher training activities will be implemented according to the following five basic policies.

- Secure a stable domestic supply of fishery products.
- Establish a system of fisheries resource management.
- Achieve sustained development of fishery product export.
- Alleviate poverty in the fisheries communities and improve the living environment.
- Achieve efficient administrative and financial management.

When projects aiming at improvement in production, processing, marketing and fisheries resource management are concerned, the low awareness of fishers regarding these projects and the lack of cooperatives and other social institutions are major factors which impede their effective implementation. The benefits that will be derived from this Master Plan, which focuses on institutional building and capability improvements, are mainly socio-economic, and it will not necessarily produce quantitative economic betterment. Therefore, this chapter will explain the overall benefits that will be achieved by the Master Plan.

(1) Increased Fisher Income and Mobilizing the Fisheries Community Economy

Developing cooperative activities by organizing the marketing activities of fisheries production will improve production efficiency, expand the distribution market, and increase fisher income (Programmes 1 and 11). In addition, improvements in post harvest processing technology will increase the value added fishery products, which will in turn, raise the income of processors (Programmes 4, 5 and 10). Increased fisher income will improve the purchasing power of the fishers and mobilize the economic activities of the fisher communities.

(2) Effective Use of Resources and Increased Food Supply

Due to inadequate scientific data on resources in Tanzania, fisheries production must be carefully monitored. In view of the anticipated increase in fish demand in the next decade, the fishing pressure on fishing grounds is expected to increase. Under this Master Plan, the aim is to achieve the profitability of fishers using appropriate fishing technology, while increasing fisheries production by distributing fishing pressure through diversification of the fishing grounds and other measures. In particular, organizing the fishers will not only achieve efficient production, but will enable the task of resource management and control to be implemented by the fishers in future.

To prevent the risk of overexploiting fishery resources through improved fishing technology, a plan to reduce post harvest losses (Programme 5) and effectively utilize the fish remnants of processing factories will be developed (Programme 4). The goal is to increase the food supply without increasing the burden on fishery resources. The programme on environmental education (Programme 12) will raise fisher awareness about fisheries management and develop self-reliant fisheries management activities.

(3) Securing Foreign Currency, Employment and Income for Artisanal Fishers

An increased supply of the Nile perch, which comprises 90 percent of the country's fish exports, is not expected due to limited resources. Therefore, a programme to develop a production base by higher value added processed products using the same raw material will be implemented (Programme 10), and an increase in export value is anticipated. Achieving a stable export industry will also lead to

stable income and employment for artisanal fishers, whose existence is interdependent with the export processors (processing companies are prohibited legally from engaging in fishing activities and they are dependent on artisanal fishers for their raw supply). In addition, 15 percent of the financial source for the planned Fisheries Development Fund will stem from Nile perch export royalties. Therefore, a stable export industry will also benefit artisanal fishers through the Fisheries Development Fund.

(4) Expanding the Economic Activities of Women in Fishing Communities

Fish processing is an important economic activity for women. Women groups have been given priority in the programmes that will provide supervision in improved processing technology. This will create economic opportunities for women and increase their income. In addition, the participation of women in fisheries community development projects will strengthen their role and voice in the community (Programmes 5, 9 and 12).

(5) Mobilizing Organizations

In the Master Plan, the established fishery cooperatives in Dar es Salaam and Coast region will assist in developing a model cooperative (Programme 1). The aim of this trial project to strengthen cooperatives is to alleviate the strong fisher distrust of cooperative activities, to improve their perception of cooperatives, and mobilize local fisher group activities.

(6) Strengthen Regional Decentralization of the Fisheries Sector

The key to achieving successful regional decentralization is to implement direct measures to strengthen the capabilities of the government fisheries officers and to improve the self-reliance of the district fisheries administration (Programmes 14 and 15). The activities of the teams comprised of district fisheries officers, cooperative officers, and agricultural extension personnel are anticipated to promote the rational use of limited human resources and raise the districts' administrative capabilities (Programmes 7, 9 and 12).

(7) Achieving Impartial Development

The Master Plan has focused on the development of Lake Tanganyika and Lake Nyasa where fisheries development has lagged, in contrast to the area bordering the Indian Ocean and Lake Victoria. The aim is to improve the livelihood of the fishers where development has been relatively minimal and to achieve impartial and fair development.

2 ECONOMIC EVALUATION

This Master Plan focuses on the capacity building of staffs of Fisheries Division and organizations related of fisheries. Therefore, it is not suited to evaluate the plan using Internal Rate of Return (IRR). The objective for the training and capacity building plan was set to meet the per capita fish consumption demand. In this section, the comparison between benefits and costs is conducted in order to examine the appropriateness of this Master Plan. But the benefits are assumed only for reference and not so rigid for project terms. In the same meaning, the financial balances on some priority programmes with facility construction are calculated for reference, and attached in Annex 1.

(1) The precondition of economic evaluation

The US currency for economic evaluation of programmes is used, without considering the inflation. The IRR cut-off rate is presumed to be 5 percent, referring the lowest loan interest rate of the Central Bank of Tanzania.

(2) Economic benefits

The major benefits are shown in Table 6-1.

Table 6-1 Major Benefits of Master Plan

Basic Concepts	Development Strategies	Major Benefits (Economic effectiveness expected)
Basic Concept 1: Stable Supply of Fish for Domestic Consumption	Strengthening Fisheries Cooperatives/ Organizations	<ul style="list-style-type: none"> • Increase household income of artisanal fishers • Secure fish protein (Improvement of peoples' nutrition)
	Improvement of Fishing Technologies and Extension	<ul style="list-style-type: none"> • Develop new fishing area and increase fish-catch
	Reduction of Post Harvest Losses and Promotion of the Fish Utilisation by Shifting from Non-food to Food Purposes	<ul style="list-style-type: none"> • Prevent excessive fishing on coastal area • Reduce the marketing cost • Increase fresh fish supply (reduce market loss)
	Reduction of Marketing Costs and Development of Fish Distribution System	<ul style="list-style-type: none"> • Reduce post harvest loss • Change to non-food to food fish products
	Implementation of Feasibility Survey on Aquaculture and Establishment of a Development Model	<ul style="list-style-type: none"> • Create job opportunity
Basic Concept 2: Sustainable Use of Fishery Resources	Strengthening of Fishers Organizations for Resource Co-management	<ul style="list-style-type: none"> • Reduce the risk of over fishing • Use resources effectively
	Publication of Fisheries Statistics (1997-) and Preparation of Effective Data Processing System	
	Collection of Biological Information on Catches at Major Landing Sites	
Basic Concept 3: Sustainable Development of Fish Exports	Implementation of Market Survey on Tanzanian Fish Product	<ul style="list-style-type: none"> • Increase in fish price of fish with quality improvement • Gain foreign currency
	Strengthening of the Competitiveness of Export Product by Improving Quality Control Capabilities	<ul style="list-style-type: none"> • Secure Fisheries Development Fund (FDF) • Increase export value (Supply value added products) • Use resources effectively • Reduce post harvest loss • Create job opportunity
Basic Concept 4: Reduction of Poverty and Improvement of the Livelihood in the Fisheries Communities	Fostering of Fisheries Community Organizations and Improvement of Institutional Capabilities of Fishing Villages	<ul style="list-style-type: none"> • Increase household income of artisanal fishers • Increase income from non-fishing activities • Develop industries with intensive labour • Create job opportunity
	Mobilization of the Economic Activities of Fishing Villages	
	Women's Economic Activities Encouragement	
	Social Infrastructure Improvement in Communities	

In this section, a trial calculation for the following four benefits was done under the assumptions.

- A. Increase in fish-catch by introducing appropriate fishing technologies
- B. Reduction of losses by improving post harvesting technologies
- C. Increase of foreign currencies by developing value added fisheries products for export
- D. Increase of fishers' household income through organising fisheries communities and promoting economic activities in fishing villages

A Increase in Fish-catch by Introducing Appropriate Fishing Technologies

The fish-catch between 1991 and 2000 shows 0.2 percent decline per annum. This Master Plan aims to increase fish production by 400,000 tons for 2012. In this economic analysis, the continuous decline in fish-catch by 0.2 percent per annum is assumed and the difference in figures between cases with and without implementation of the Master Plan is calculated as the benefit as shown in the following table.

Table 6.2 Fish-catch Volume with and without Master Plan and the Benefit

	2000	2005	2010	2012
With MP	*320,900	350,249	382,281	395,900
Without MP		317,704	314,540	313,283
Benefit*		US\$ 9,763,500	US\$ 20,322,300	US\$ 24,785,100

Note: * Benefit for Year 2000 was based on average price of fishes assumed as US\$ 0.3/kg, following the statistical data of fish-catch and market price at beaches in Tanzania by Fisheries Division

B Reduction of Losses by Improving Post Harvesting Technologies

While Nile perch is an important resource to get foreign currencies, more than half of its raw materials are disposed as wastes. The construction of a processing factory in Musoma which enables effective use of these materials, will generate the benefit by US\$ 667,800 per year.

Volume of waste of N/P:	30 tons/day
Sales price of waste of N/P:	Tsh.65/kg
Working days:	300 days/year
Exchange rate:	US\$ 1 = Tsh.876
Value calculated:	$30 \text{ tons} \times \text{Tsh}/65,000/\text{tons} \times 300\text{days}/\text{Tsh}/876 = \text{US\$ } 667,800$

Further more, the reduction of the market loss on Dagga Kigoma during rainy season by 25 percent, will generate the benefit of US\$ 4,000,000 per year.

Marketing volume on Dagga Kigoma:	40,000 tons/year
Sales price on Dagga Kigoma:	Tsh.344/kg=US\$ 0.4/kg
Expected loss rate reduced:	25 percent
Value calculated:	$40,000 \text{ tons} \times \text{US\$ } 0.4/\text{kg} \times 1,000 \times 0.25 = \text{US\$ } 4,000,000$

C Increase of Foreign Currencies by Developing Value Added Fisheries Products for Export

The export value of fisheries products has increased by 8 percent per annum between 1996 and 2000 (Fisheries Division). The export of Nile perch has increased by 1.9 times in volume and by 97 times in value. However an increase in fish-catch of Nile perch is not expected when its resource management is concerned. On the other hand, an increase in its export unit price is expected as the worldwide demand for fish grows. Therefore in this economic analysis, the increase of foreign currencies from development of value added export fisheries products. These products also include the re-processed products from leftover materials. As a result, US\$ 9,000,000 will be generated from the export of value added products which is 20 percent of existing exported fillet, and US\$ 1,800,000 from re-processing of leftover materials by 10 percent.

Export volume on Nile perch in 2000:	30,000 tons/year
Export value on Nile perch in FOB price in 2000:	US\$ 45 million
Unit price calculated:	US\$ 1,500/tons
(Assumptions)	
Ratio of value adding processing:	20 percent
Expected increase rate of unit price by value adding processing:	100 percent
Volume of leftover processing product:	9,000 tons
Ratio of export on leftover processing product:	10 percent
Expected unit price of leftover processing product:	US\$ 2/kg
Benefit calculated	
Added-value processing product	$30,000 \text{ tons} \times 0.2 \times \text{US\$ } 1,500 \times 1 = \text{US\$ } 9,000,000$
Leftover processing product	$9,000 \text{ tons} \times 0.1 \times 2 \times 1,000 = \text{US\$ } 1,800,000$
Total	US\$ 10,800,000

D Increase of Fishers' Household Income through Organising Fisheries Communities and Promoting Economic Activities in Fishing Villages

Strengthening fishers' unions and establishing credit scheme for fishers will increase fishers' household income and fisheries income in villages. In a traditional economic analysis, these factors were considered to be inner transferences and not measured as direct benefit. However in this Master Plan, the increase of household income for fishers and fisheries is calculated to be a direct benefit as it promotes the sustainable fish resource management.

- Organising fisheries community allow fishers to participate in fish price formation process which may increase fishers' income by 8 to 10 percent as in the case of BMU in Kayenze. The other experience in RIPS shows that micro credit schemes for women increase their job opportunities.
- As a result of combined effects from the Master Plan implementation, 5 percent increase in income from both fisheries and fisheries related activities is assumed.
- The average income is calculated from the field survey conducted by the Study Team as Tsh.582,000/year from fish-catch and Tsh.307,000/year from fisheries related. The benefits are calculated multiplied by the number of beneficiaries as following;
- The number of beneficiaries is assumed to be 2,000 for fishers and 8,000 for fisheries related.

Benefit calculated	
Fishers:	$2,000 \times 582,000 \times 0.05 = \text{Tsh.}58,200,000 = \text{US\$ } 66,438$
Fisheries related:	$8,000 \times 307,000 \times 0.05 = \text{Tsh.}122,800,000 = \text{US\$ } 140,183$
Total:	US\$ 206,621

(3) Calculation of Benefits between 2003 and 2012

Assuming the above mentioned benefits in 2012, benefits in each year are calculated according to the implementation schedule of priority programmes (Table 5-3) as follows.

Table 6-3 Benefit Calculation by 2012

	Benefit	'03	'04	2005	2006	2007	2008	2009	2010	2011	2012
A	Fish-catch	0	0	3,098,138	6,196,275	9,294,413	12,392,550	15,490,688	18,588,825	21,686,963	24,785,100
B	Nile perch processing	0	0	0	0	0	0	166,950	333,900	500,850	667,800
	Dagaa Kigoma processing	0	0	500,000	1,000,000	1,500,000	2,000,000	2,500,000	3,000,000	3,500,000	4,000,000
C	Export of value added product		0			0	1,800,000	3,600,000	5,400,000	7,200,000	9,000,000
	Export of Nile perch leftover					0	360,000	720,000	1,080,000	1,440,000	1,800,000
D	Increase in income		0	25,828	51,655	77,483	103,311	129,138	154,966	180,793	206,621
	Total	0	0	3,623,965	7,247,930	10,871,895	16,655,861	22,606,776	28,557,691	34,508,606	40,459,521

(4) Master Schedule and Costs

The programme costs are calculated from the estimated cost given to each priority programme and its implementation schedule. Facility construction and equipment procurement that come together with Technical Cooperation (T/A) are to be carried out one year before the implementation of the programme.

Table 6-4 Changes of Programme Costs

Project Costs		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1) Marine Fisheries CB	T/A		773,600	773,600			709,294	709,293				
	Facility	4,506										
2) DSM Fisheries Infr. Improv.	T/A	0	0	0	0	92,127	92,127					
	Facility		0		0	1,725,339	1,725,339					
3) L. Victoria FCB	T/A		0	0			84,252	84,252	84,252	0		
4) Fish Market improv.	Facility	0	2,880,354	2,880,353								
	T/A	0	63,755	63,755								
5) L. Tanganyika DFD	Facility	47,410			47,409							
	T/A		9,525	9,525		9,525	9,525					
6) L. Nyasa extension Centre	T/A		0	0	0		21,367	21,367	21,366	0		
	Facility					0	70,514					
7) Aquaculture extension	T/A			0	0			208,533	208,533	208,534		
8) Financial support	Fund		0			200,000			200,000			
	T/A		0	0		206,230	206,230		206,230	206,230		
9) CME	T/A		277,800	277,800	277,800	0	0					
10) Export promotion	T/A		0	0	153,400	153,400	153,400					
	Facility		0	0	129,800	0	0					
11) Landing beach improv.	Facility	0				1,373,729						
	T/A		0	0	0		158,600	158,600	158,600			
12) FCD	T/A		193,691	193,691	193,691							
13) FIM improv.	T/A		513,493									
14) FID improv.	Facility		0	132,357	1,321,356							
15) Training for imp. MP	T/A		48,101	48,101	48,101							
Total		51,916	4,730,389	5,558,262	2,171,567	4,440,664	3,232,667	474,752	881,001	414,784	0	0

The operational and maintenance costs (O&M costs) noted in each priority programme are used for the following calculation. If there is no description on O&M costs in Chapter 3, they are calculated under the following conditions.

- Facility maintenance cost: 5 percent of facility construction cost
- Equipment maintenance cost: 10 percent of equipment purchase cost

O&M costs for each programme between 2003 and 2012 are shown in the following table.

Table 6-5 O&M Costs for Priority Programmes

O&M costs	'03	'04	2005	2006	2007	2008	2009	2010	2011	2012
1 Coast			52,740	52,740	52,740	66,732	66,732	66,732	66,732	66,732
DSM-fm						123,032	123,032	123,032	123,032	123,032
2 Kivcon						5,556	5,556	5,556	5,556	5,556
Kirumba			223,155	223,155	223,155	223,155	223,155	223,155	223,155	223,155
4 NP-lopp			1,572,108	1,572,108	1,572,108	1,572,108	1,572,108	1,572,108	1,572,108	1,572,108
5 Kigoma			3,427	3,427	3,427	6,854	6,854	6,854	6,854	6,854
6 Nyasa						1,207	2,413	3,620	4,827	4,827
8 F-support					80,000	80,000	80,000	160,000	160,000	160,000
10 Exp-imp				9,483	9,483	9,483	9,483	9,483	9,483	9,483
11 Land-beach					47,409	94,818	142,227	142,227	142,227	142,227
14 FED-imp				152,652	152,652	152,652	152,652	152,652	152,652	152,652
Total	0	0	1,851,430	2,013,564	2,140,973	2,335,596	2,384,212	2,465,419	2,466,625	2,466,625

The rates of conversion factors for calculating economic prices are shown in the following table. The rates are based on Standard Conversion Factor (SCF = 0.86) and minimum wage in Tanzania (Tsh.30,000/month = Tsh.360,000/year).

Table 6-6 Conversion Factor Adopted

Item	Conversion Factor
Project costs	
Facility	0.75
Technical Assistant	0.9
Fund	1.0
O&M costs	0.71

(5) Calculation of IRR

The Economic Internal Rate of Return (EIRR) was calculated based on the four benefits and the total of economic costs of 15 programmes. The result was 57.2 percent, that was very big compared to other projects. The reason supposed is that many programmes are soft projects without facility construction or with very small construction costs.

(6) Sensitivity Analysis

The sensitivity analysis for benefits was done for the following three items.

Table 6-7 Sensitivity Analysis on Benefits

Benefit	Assumption	Calculation formula	Sensitivity analysis
Increase of fish catches	Expected increase rate	Present catch x increase rate	+15% - - 15%
Increase of Foreign Currency	Expected price up	Present export value	+15% - - 15%
Increase of Fishers' Income	Expected increase rate + Expected price up (3 years delay)	Income of beneficiaries	+15% - - 15%

The sensitivity analysis for costs was done for the following three programmes with big facility construction. (+15 percent to -15 percent)

- Dar es Salaam Fisheries Infrastructure Improvement Programme (DSM FII)

- Lake Victoria Fish Marketing Improvement Programme (Lake Victoria FMI)
- Fisheries Training Institute Improvement Programme (FTII)

The results of sensitivity analysis are summarized as following table.

Table 6-8 Results of Sensitivity Analysis (EIRR)

		Unit: %					
		-15%	-10%	-5%	+5%	+10%	+15%
Benefit	Fish catches	52.6	54.2	55.7	58.6	60.0	61.4
	Foreign currency	55.8	56.3	56.7	57.6	58.0	58.5
	Fishers' income	57.1	57.1	57.1	57.2	57.2	57.2
Cost	DSM FII	57.4	57.3	57.2	57.1	57.0	56.9
	Lake Victoria FMI	59.0	58.4	57.8	56.6	56.0	55.4
	FTII	57.7	57.5	57.3	57.0	56.8	56.6

As for benefits, 'Increase of fish-catches' shows the highest sensitivity. Concerning costs, 'Dar es Salaam Fisheries Infrastructure Improvement Programme' shows high sensitivity. It may be desirable to reduce the construction costs through appropriate construction control.

3 FINANCIAL EVALUATION

The revenues by programme are assumed as following table. The results of calculation of Financial Internal Rate of Return (FIRR) showed it impossible to get IRR. The ratio of Revenue/Cost (R/C) was only 0.51, when the discount rate was 5 percent set for cut-off rate.

Table 6-9 Assumption of Revenue by Programmes

		Unit: US\$	
	Programme	Assumption adopted	Revenue in 2012
1	Marine Fisheries Sub-sector Capacity Building	Following Annex of programme for DSM and Mafia. Phase II for Southern coastal area, same assumption in Mafia is adopted.	70,776
2	DSM Fisheries Infrastructure Improvement (Fish market extension)	10% of income from new Banda beach fish market estimated in basic design study + user fee of ice plant and refrigerator	348,100
	DSM Fisheries Infrastructure Improvement (Kivukoni)	Following Annex of programme	6,376
4	Lake Victoria Fish Marketing Improvement (Kirumba)	The surplus of MWADESO in 2001 x 1.12	28,669
	Lake Victoria Fish Marketing Improvement (Nile perch leftover processing)	90tons/day x Tsh.65/kg x 300days	2,231,735
5	Lake Tanganyika Dagaa Fisheries Development	3% of Kigoma district own revenue	11,076
6	Lake Nyasa Planked Canoe Extension	3% of Kyela district own revenue	5,589
8	Fisheries Financial Support	1% of own revenue of Ilala municipality and Mafia district + 85% of the surplus of UWAWADA	17,532
10	National Fish Export Promotion	Present inspection cost (contract-out)	30,000
11	Lake Victoria Major Landing Beach Improvement	Following Annex of programme	424,705
14	Fisheries Training Institute Improvement	5% of the Revolving Fund of Nyegezi FTI	4,142

Table 6-10 Changes in Revenue by Programmes

Revenue	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Coast			55,936	55,936	55,936	70,776	70,776	70,776	70,776	70,776
DSM-fm						348,100	348,100	348,100	348,100	348,100
Kivukoni						6,376	6,376	6,376	6,376	6,376
Kirumba			25,597	25,597	25,597	25,597	25,597	25,597	25,597	25,597
NP-lopp			2,231,735	2,231,735	2,231,735	2,231,735	2,231,735	2,231,735	2,231,735	2,231,735
Kigoma			5,538	5,538	5,538	11,076	11,076	11,076	11,076	11,076
Nyasa						1,397	2,794	4,191	5,589	5,589
F-support					3,506	7,013	10,519	14,026	17,532	17,532
Exp-imp				10,000	20,000	30,000	30,000	30,000	30,000	30,000
Land-beach					141,568	283,137	424,705	424,705	424,705	424,705
FED-imp				4,142	4,142	4,142	4,142	4,142	4,142	4,142
Total	0	0	2,318,806	2,332,948	2,488,023	3,019,350	3,165,822	3,170,725	3,175,629	3,175,629

The total revenue calculated can cover the total O&M costs. However, for three programmes; Lake Victoria Fish Marketing Improvement Programme (Kirumba), Fisheries Training Institute Improvement Programme and Fisheries Financial Support Programme, the expected revenue cannot cover O&M costs. Concerning programme costs, it is necessary to be covered by foreign aid and Fisheries Development Fund (FDF) of Fisheries Division.

The burdens of programmes are summarized in the following table.

Table 6-11 Burden for Programmes by Foreign Aids and FDF

Unit: US\$'000				
	Short	Middle	Long	Total
Foreign aid	8,552	8,276	1,770	18,598
FDF	1,769	1,598	0	3,367
Total	10,321	9,874	1,770	21,965

If the financial resource of FDF is assumed 15 percent of Export Royalty, and local portion (burden) is 20 percent of facility construction costs, the accumulation of FDF will be US\$ 2.7 million. Therefore it will be possible to develop sustainable fisheries. (The revenue of Export Royalty is assumed to be at the same level of 2001 until 2007, and after 2008 it will increase by 3.15 percent per annum, advanced by the 'National Fish Export Promotion Programme'.

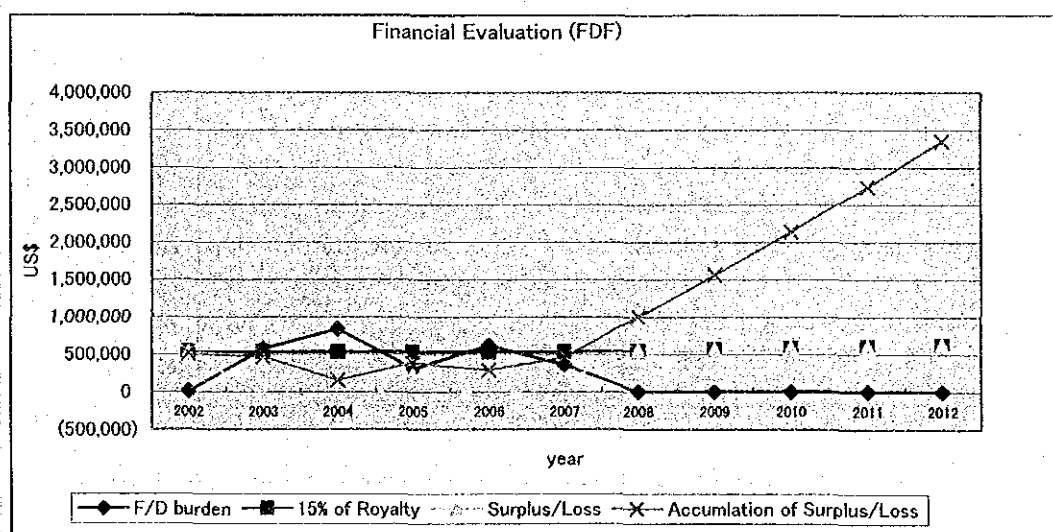


Figure 6-1 Financial Evaluation (FDF)

4 ISSUES AND MEASURES (CONCLUSIONS OF ECONOMIC/ FINANCIAL EVALUATION)

- (1) This Master Plan consists of 15 programmes with various factors. The results of analysis show that economic benefits are very big and acceptable in the economic evaluation but financial profitability is very small. Therefore, on the starting period of each programme, it is necessary to secure foreign aids positively and to establish FDF based on Export Royalty, and to keep the unremitting efforts to develop fisheries in Tanzania, especially by Fisheries Division.
- (2) Concerning priority programmes, Construction and renovation of Kirumba Market and Nyegezi Freshwater Fisheries Training Centre need a lot of facility construction costs. That may cause the big financial burden to the management bodies. It is necessary to control construction management and avoid maintenance costs to grow bigger.
- (3) Concerning the Fisheries Financial Support Programme, it is necessary to increase the revenues of fishers' union and district authority. It is also necessary to reduce the dependence to NGOs, and strengthen fishers' union in future.
- (4) It is desired to evaluate the programme on time, and adjust the programme to generate actual economic benefits.

5. ENVIRONMENTAL EVALUATION

Of the above 15 programmes, only Programmes 2, 4, and 11 have significant construction components. Programme 2 could be classified as "development on beach front" listed under Appendix 1, and would require mandatory EIA (Environmental Impact Assessment) or an environmental consideration report (as was the case for the Banda Beach Fish Market). Programmes 4 and 11 could be classified as "fish landing station" listed in Appendix 2, which may or may not require EIA.

Programme 14 which involves rehabilitation of existing Nyegezi Freshwater Fisheries Training Institute could be classified "technical assistance" listed in Appendix 2, which may or may not require EIA. As the rehabilitation will be at the same location as existing buildings, significant negative impacts is not expected on the natural environment.

Programme 6 could be classified as "boat building" listed in Appendix 2, but since it is not a boat building project per se but rather a project to introduce plank canoe construction technology to the fishers of Lake Nyasa, this project is not expected to have any significant impact on the environment and thus would not require an EIA.

The other programmes are mainly comprised of "soft" components, are not in the mandatory list, are not located in Environmentally Sensitive Areas, and not expected to impact significantly on the natural environment, therefore EIA would not to be required.

In this Master Plan Study, IEE (Initial Environmental Evaluation) was performed on Programmes 2, 4, and 11 to identify possible significant impacts and to proposed mitigation measures to lessen or avoid these impacts. Subsequently according to the NEMC's (National Environment Management Council) screening procedure, if the programme is "Passed", the programme will be submitted for review and implementation. If the programme "Failed", the proponent or implementation body will then need to carry out an EIA and comply with the EIA Procedure in Fig 2-2 in Annex 2.

The final decision on whether a project component will require an EIA or not, or a less stringent assessment report, will depend on NEMC's evaluation of the "Environmental Assessment Registration Forms" for the programme's components.

VII RECOMMENDATIONS

CHAPTER 7 RECOMMENDATIONS

(1) Rapid Implementation of the Priority Programmes and Use of Foreign Experts

The Master Plan is comprised of 15 priority programmes and its diverse activities range from finances, providing technical support to local communities, to requesting financial assistance from international donors. The project covers four major water bodies in the country and its implementation is complex. Therefore, the implementation schedule of its many programmes and activities, and their progress must be accurately grasped. To accomplish this, the Fisheries Division, which is the main government body that will oversee the project, must swiftly establish a Project Implementation and Management Committee, enact appropriate budgetary measures, and officially request the cooperation of assistance institutions, and other measures to enable the programmes to be implemented quickly.

The majority of the priority programmes will be implemented as model projects at the district level, but technical assistance in the regions are still dependent on assistance from the central government. Thus the committee must secure budget adjustments to enable it to coordinate the programmes at their initial start.

To facilitate the task of programme implementation and coordination, it is recommended that a foreign expert is dispatched and placed in the committee in view of the need for initial input from assistance institutions and the neutral position of such institutions.

(2) Early Establishment of the Fisheries Development Fund

To implement the Master Plan, it is important to secure a financial source in order to achieve stable fisheries development. The early establishment of a fisheries development fund is recommended, in view of the decentralization that has been pursued under the new fisheries law. Much of the initial investment that will be made for the priority programmes will be by donor countries and international institutions, but *diverse financial sources must be procured to cover the increased operations and maintenance costs that will be incurred domestically.* This will stabilize the finances of the programmes.

Presently, the provisions of the draft proposal of the Fisheries Development Fund has focused on developing the BMU and protecting fisheries resources. The financial source of the fund will stem from licensing fees (25%) and royalties (15%), and the scope of the fund is estimated at US\$ 1,000,000. Since the financial source stems from taxes, it is appropriate and fair to allocate a fixed amount of the fund for environmental conservation at Lake Victoria. However, it is necessary to study the flexible and far-ranging use of these funds for artisanal fisher education, for development of improved processing and marketing technology that effectively uses resources, and for micro projects that are needed to develop the fishing communities.

(3) Publication of Annual Report on Fisheries to Promote Public Information

Due to structural reforms and regional decentralization measures that have been pursued by the central government to replace the traditional top-down administrative approach, the key to achieving successful public administration is to obtain the cooperation of the private sector and fishers. Therefore, all the programme and projects pertaining to fisheries management, fishing community development, and others that will be implemented under the Master Plan will include the participation of fisher organizations and private NGOs. Thus an important task is to cultivate the understanding of the participants and to evaluate and review their roles and activities.

Unfortunately, the information needed to promote the understanding and evaluation of fishery activities is generally managed and limited to a few individuals, and public information is nonexistent. Presently, the dissemination of the Annual Report of the Fisheries Division is strongly recommended as a means of promoting the widespread understanding of fisheries development policies and their progress. Public information that is available nationwide is essential for the regional fisheries

administration, which lacks parallel ties with other government bodies and institutions due to decentralization. In particular, the evaluation of current project policies improves effectiveness and efficiency, and plays an important role in improving administrative services despite limited financial sources. Therefore, it is recommended that a policy evaluation system that will provide public information is created in the Fisheries Division.

Since Tanzania's national policy and the assistance policies of donor countries has focused on poverty eradication and the trend is for major sectors to converge, the Fisheries Division must provide outside information in order to contribute actively to the socio-economy of fisheries.

(4) Integration of the Nyegezi Freshwater Fisheries Training Institute and the Mbegani Fisheries Development Centre

It is recommended that the Nyegezi Freshwater Fisheries Training Institute and the Mbegani Fisheries Development Centre be rationalized and integrated, in order to raise the impact of the educational and training activities. Since 99 percent of fisheries production in Tanzania is carried out by artisanal fishers, it is essential that the district fisheries officers and fisheries extension personnel, who are in charge of providing guidance for fishers, maintain an adequate level of technical expertise. In view of the number of government fisheries personnel available, it is irrational to maintain two independent training institutions. To raise the operations ratio of educational equipment and facilities that presently overlap, their common usage is recommended, excluding inland and marine fisheries related activities.

Since 80 percent of fishery production and 70 percent of the district fisheries personnel belong to inland districts, it is suitable that the functions of the Nyegezi Freshwater Fisheries Training Institute are upgraded. In particular, if regional cooperation between Kenya and Uganda, which both share the use of Lake Victoria, is expanded, the role of Nyegezi in educating the fishers and government fisheries officers will become important to promoting stable regional cooperation. Measures to strengthen the functions and the facilities and equipment of the Mbegani Fisheries Development Centre to provide services in the technical development of coastal fishers are recommended. Facilities and equipment for commercial based fisheries can be leased to the private sector and practical training with the cooperation of the private sector can be pursued. However, development of technical training in fisheries and processing for coastal artisanal fishers must be based on local resources. Therefore, they must incorporate and reflect the coastal regional characteristics.

(5) Programme Implementation Based on a Sense of Responsibility and Self-reliance of the Beneficiaries

The fundamental objective of the programmes are to strengthen the capabilities of the district fisheries officers who provide direct guidance to the fishers. The aim is to foster self-reliant fisheries by fishers by effectively utilizing fishery production equipment and materials. However, the general perception of government support of fisheries remains tied to the free government services that were provided during the socialist era. Subsequently, many problems such as the lack of basic fisher understanding about fisheries management, the profitability of fisheries activities, and the lack of technical and basic capabilities exist. Therefore, workshops and other basic training activities will be held to promote the responsibility and role of the beneficiaries and to define their responsibilities prior to the start of the programmes and to acknowledge the importance of selecting fishers with a high sense of responsibility and capabilities.

(6) Suggestion for the Project Implementation from Financial Aspect

This Master Plan proposes programmes which consist of various factors. Though it has high economical benefits, its financial returns are low. Therefore, for the initiation of programmes, the establishment of the Fisheries Development Fund (FDF) from royalties and active commitment by the Fisheries Division in supporting fisheries development are necessary together with securing foreign aid.

Considering individual programmes, programmes which propose the construction of Kirumba market and renovation of Nyegezi Freshwater Fisheries Training Institute require high costs for not only construction but also its maintenance. Appropriate management on construction is necessary for keeping the cost to a minimum.

For fisheries financial support, the establishment of the financial foundation in districts and cooperatives for maximising their income is important. By doing so, reinforcement of cooperatives are to be expected which also reduces their dependency on NGOs and donors.

An appropriate evaluation should be carried out in order to adjust the project implementation for generating real economic benefits during their implementation period.