

ERI/92/001
ERI/92/C01
ERI/94/001

**UNITED NATIONS DEVELOPMENT PROGRAMME
FINAL REPORT**

EX POST EVALUATION

.

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Semhar Fisheries Rehabilitation Project

**Project No. ERI/92/001 (UNDP)
Project No. ERI/92/C01(UNCDF)**

Capacity Building for the National Marine Resources Programme Project No. ERI/94/001 (UNDP)

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June 2001

Ex post Evaluation of ERI/92/001(UNDP) ERI/92/C01(UNCDF) and ERI/941001(UNDP)

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Table of contents

<u>Executive Summary</u>	3
<u>Project Data Sheet</u>	5
<u>1.0 Introduction and Project Background</u>	6
<u>1.1 Project Background</u>	6
<u>1.2 Mission activities</u>	7
<u>1.3 The Regional oceanographic setting</u>	7
<u>2.0 Project concept and design: Objectives and Outputs</u>	9
<u>2.1 Semhar Fisheries Rehabilitation Project</u>	9
<u>2.1.1 Development objectives</u>	9
<u>2.1.2 Immediate objectives</u>	10
<u>2.1.3 Outputs</u>	10
<u>2.2 Capacity Building for the National Marine Resources Programme</u>	10
<u>2.2.1 Development objectives</u>	10
<u>2.2.2 Immediate objectives</u>	11
<u>2.2.3 Outputs</u>	11
<u>2.3 Critique and evaluation</u>	11
<u>3.0 Project implementation</u>	14
<u>3.1 Status and performance of input delivery</u>	14
<u>3.1.1 Semhar Fisheries Rehabilitation Project</u>	

14		
<u>3.1.2</u>	<u>Capacity Building Project</u>	
18		
3.2	<u>Project reporting, monitoring and evaluation</u>	
19		
4.0	<u>Evaluation of Project Outputs</u>	
20		
<u>4.1</u>	<u>Project impact</u>	
20		
<u>4.1.1</u>	<u>Semhar Project</u>	
20		
<u>4.1.2</u>	<u>Capacity Building Project</u>	
25		
4.2	<u>Project relevance and effectiveness</u>	
25		
<u>5.0</u>	<u>Critical issues</u>	
27		
<u>5.1</u>	<u>Sustainability</u>	
27		
<u>5.2</u>	<u>Monitoring and evaluation</u>	
28		
<u>6.0</u>	<u>Lessons and recommendations</u>	
28		
<u>7.0</u>	<u>List of documents and references</u>	
36		
—	<u>List of persons met</u>	
38		
	<u>Evaluation summary</u>	39

List of Abbreviations

AfDB African Development Bank CPPM
 CTA DFC DMRIF EEZ FA
 FAO FRP GEF GoE HRD ICZM ITQ JICA KPI LFA MCS MSY NGO NMRP PGE PIM
 PRODOC SDFCS SFCS SRF
 TA TCP TPR TURF VMS VQ
 Complementary Project Preparation Mission
 Chief Technical Advisor Dahlak Fisheries Centre
 Department of Marine Resources and Inland Fisheries Exclusive Economic Zone
 Fishermen's Association
 Food and Agriculture Organisation of the United Nations Fibre-glass Reinforced Plastic Global
 Environmental Facility Government of Eritrea
 Human Resources Development Integrated Coastal Zone Management
 Individual Transferable Quotas
 Japanese International Co-operation Agency Key Performance Indicator Logical
 Framework Analysis Monitoring Control and Surveillance Maximum Sustainable Yield
 Non Governmental Organisation National Marine Resources Programme Provisional
 Government of Eritrea Project Identification Mission Project Document

The immediate objectives of the Semhar Fisheries Rehabilitation Project have largely been achieved. The fishing fleet has been rehabilitated through the refurbishment of existing boats and the purchase of new ones, and the sector has been revitalized due, in large measure, to project activities. Progress towards achieving the long-term development objectives has been greatly aided by this project through the tangible outputs of infrastructure and the production throughput. Whereas the contribution of the fisheries sector at the start of the project was insignificant, data for 1999 show that, though still small, the contribution of the fisheries sector has grown to a significant 10% of the agricultural sector. The latter's percentage of GDP¹ is 16%. This was made possible by construction of various infrastructural facilities, resulting in improved income of fishermen and crew, increased availability of fish in the local market and increased exports of high quality fish.

After decades of economic de-coupling from the rest of Eritrea, the coastal areas and the Dahlak Archipelago were a high priority of the Provisional Government of Eritrea at the time the Semhar Project was being formulated in that these areas had to be brought back into the economic mainstream of the country. Hence, the inclusion in the project document of social objectives such as improving the incomes and quality of life for fishing communities through health and educational infrastructure and services. These objectives were too broad to be addressed under a fisheries project and were later deleted from the project plans. A second project, the Capacity Building Project, was initiated after the extent of shortage of planning, managerial and informatics skills was recognised.

Assessment of the sustainability of activities flowing from the two projects since their closure is hampered in part by the border conflict with Ethiopia. Many able bodied men and women in the Ministry of Fisheries as well in the fishing communities have been drafted into the National Service thus affecting the progress of project activities.

Though these two projects have been at the core of the transformation of the fisheries sector in Eritrea and the assistance is appreciated, the need for continued help to propel the development in a self-sustaining manner is still very much in evidence. These needs are for more infrastructure facilities, not so much in larger cities of Massawa and Assab, but in the fishing communities themselves. Development assistance is also acutely needed in capacity building and skills training, in particular, the development of scientific and analytical skills as well as financial and managerial skills. These skills are needed by the Ministry cadres as well as by the fishermen's co-operatives.

Whereas some facilities, such as the refrigeration company REFCO, are well on their way to financial independence and sustainability, others, like the Massawa Boat Yard, are not likely to be sustainable without an open-ended subsidy. The evaluation mission suggests a new for the Massawa Boat Yard as a satellite or a subsidiary to the joint venture company Harena Boat Yard on Haleb Island. This role would be for the Massawa Boat Yard to focus on repair and maintenance of the boats built by the Harena Boat Yard.

The Credit Scheme and the revolving fund started by the Semhar Project have provided much needed inputs to fishermen such as boats, engines and fishing gear. The Credit Scheme was implemented through the Co-operatives. The outputs of this activity are a mixed success and the sustainability of the scheme will depend in large measure on increased community development assistance and extension in the fishing villages. The revolving fund now has a balance of more than Nfal5 million or \$1.5 million.

¹ For more details, trends and comparisons of Eritrea with Sub-Saharan Africa and Low-income

countries see the web site of the World Bank, country profiles: <http://www.worldbank.org/data/countrydata/countrydata.html>.

Two reasons are suggested for the observed low rates of loan repayments, one being the difference in size between the domestic and the Yemeni markets, which makes payments more dependent on sales in the larger Yemeni market. The other reason is the thin profit margin with which fishermen operate. Another factor has been the border conflict with Ethiopia; resources and people were diverted away from the fisheries sector generating less income for repayment of loans.

Neither project benefited from the Logical Framework Analysis as a methodology for project planning. This may explain the overlap and lack of operational distinction between objectives and outputs. After the war of liberation the atmosphere of urgency to act against a background of near total destruction of the country's infrastructure, as well as the relatively novel nature of the methodology in 1991, may account for their absence from planners' thinking at the time.

Though Eritrea's fish resources are currently under-exploited and thus have some room for expansion, a framework for their sustainable development and management has to be developed now before serious conflicts arise. The management of Eritrea's fisheries resources is currently based on a model of open access to traditional fishermen and regulated access for the industrial trawlers through a licensing system. Large numbers of Yemeni fishermen operating in Eritrea's waters, however, are effectively unregulated. Experience elsewhere in the world over the past few decades in fisheries under similar regimes points to the eventual depletion of profitable concentrations of resources and their shift towards smaller size classes. Even within the proximity of the Red Sea, areas further north already have smaller standing stocks. This lower biomass is especially evident of desirable reef species.

There is now a growing body of evidence suggesting that management that is based on some form of property rights has prevented the classical outcome of open - or even regulated - access to fisheries resources, namely biological over-exploitation and economic over-capitalisation. The evaluation mission is well aware of the importance of the fisheries sector to Eritrea's economy and does not wish to be unduly alarmist; nevertheless, there are many other benefits to clear ownership of access rights. These property rights may well be assigned to communities or co-operative societies². The point to be made here is that clear ownership fosters a sense of responsible management for the long term'.

² For a discussion of the importance of local institutions and group action in resource management see Pretty and Ward, Social Capital and the Environment, *World Development* Vol. 29, No. 2, pp.209 - 227, 2001.

³ For a current discussion of development and dimensions of property rights in fisheries, see A. Scott, Introducing property in fisheries management; and R. Amason, Property rights as a means of economic organization. Both papers in Shotton, R. (ed.) Use of property rights in fisheries management; Proceedings of the FishRights99 Conference. Freemantle, Western Australia, 11-19 November 1999. *FAO Fisheries Technical Paper*. No 404/1. Rome, FAO. 2000

Project Data Sheet

Country:
Eritrea Sector:
Fisheries

Semhar Fisheries Rehabilitation Project

Project No. ERI/92/001 (UNDP)

Project No. ERI/92/C01 (UNCDF) Capacity Building for the
National Marine Resources Programme Project No. ERI/94/001 (UNDP)

Executing agency: Ministry of
Fisheries UN Co-operating agency:
FAO

Project financing:

	Semhar Rehabilitation	Capacity Building	Total
UNDP	USD 3 247 554	USD 828 800	USD 4 076 354 (47%)
UNCDF	USD 4 030 475	NA	USD 4 030 475 (47%)
GoE	(in kind) USD 526 500	NA	USD 526 500 (6%)
Total	USD 7 804 529	USD 828 800	USD 8 633 329 (100%)

Project Chronology:

	Semhar Rehabilitation		Capacity Building
Project No.	UNDP	ERI/92/001	ERI/94/001
	UNCDF	ERI/92/C01	
Approval Date	UNDP	1992	1994
	UNCDF	1992	

Start Date	UNDP	1992	1996
	UNCDF	1992	
Completion Date	UNDP	1999	1998
	UNCDF	2000	
Midterm Evaluation	UNDP/CDF	May 1996	Not undertaken
Ex post Evaluation	UNDP/CDF	January/February 2001	

1.0 Introduction and Project

Background 1.1 Project Background

The UNDP and UNCDF had been providing assistance to support fisheries development in Eritrea since 1986 through the Rehabilitation of the Red Sea Fisheries and Marine Fish Marketing Development Project located at Assab. This project was suspended in 1992 as the war of independence was drawing to a close.

The then Department of Marine Resources and Inland Fisheries (DMRIF) had asked the joint UNCDF/FAO Fisheries Identification Mission (PIM) to prioritize fisheries rehabilitation in the Dahlak Islands and Massawa areas rather than in the Assab area because of geographical priorities. Therefore, the mission focused the preliminary project design on fisheries rehabilitation in the Massawa and Dahlak areas.

The project document was reformulated by the Complementary Project Preparation Mission (CPPM) in June 1992 and submitted to the UNDP/UNCDF Joint action Committee. It was submitted to the Provisional Government of Eritrea (PGE) in August 1992 for endorsement.

By the end of 1992, UNDP and UNCDF had approved a new project, "Semhar Fisheries Rehabilitation", with the respective UNDP & UNCDF project numbers ERI/92/001 and ERI/92/CO1. During this period, FAO was serving as an implementing agent for UNDP/ UNCDF. FAO was also providing assistance through its Technical Cooperation Programme (TCP) through which it carried out a comprehensive review of the fisheries sector, formulated draft fisheries legislation, and recommended a development strategy that provided the basis for formulating the overall National Marine Resources Programme (NMRP).

In April 1993, pursuant to the request by PGE, the suspended UNDP/UNCDF/FAO projects in Assab, ETH/82/106 "Rehabilitation of the Red Sea Fisheries", and ETH/83/COI "Marine Fish Marketing Development" were reactivated and the funds remaining to their respective credit were placed under the managerial umbrella of ERU92/001. The project numbers were also changed to ERI/82/016 and ERI/83/CO 1 respectively. Further, in August 1993, the UNDP component ERI/82/016 was incorporated into ERI/92/001, while the UNCDF component ERI/83/COI was changed to ERI/92/C01 in June 1994.

Hence, until 1994, UNDP and UNCDF assistance was focused mainly on building infrastructure and fishing community development activities. In 1995 the second project, Capacity Building for

the National Marine Resources Programme, ERI/94/001, was started with the assistance of UNDP to complement the development efforts and strengthen Ministry of Fisheries and Marine Resource's capacity to utilize and build upon the infrastructure activities. Starting from almost totally de-capitalised sector after independence, the PGE looked naturally towards revitalising the once productive fisheries sector as a means of bringing back into the mainstream those areas that had long been economically de-coupled from the rest of the country.

The present exercise aims at evaluating the following projects jointly: the Semhar Fisheries projects ERI/92/CO 1, ERI/92/001 and the Capacity Building for Marine Resources project ERI/94/001 which were formulated and signed on in 1992 and 1994 and phased out in 1998, 2000, 1999 respectively. More specifically, the project evaluation mission is charged:

1. to assess the overall progress made in attaining the immediate objectives and the likelihood of attaining the GoE's development objectives;

6

Ex post Evaluation of ERI/92/001(UNDP) ERI/92/C01(UNCDF) and ER11941001(UNDP)

June 2001

2. to assess the relevance of the projects to the goals set by the GoE for the fisheries sector;
3. to assess the sustainability of implemented activities and/or identify exit strategies;
4. to assess the monitoring and evaluation system including review and comparison of key performance indicators and strategic results framework; and,
5. to draw critical lessons learned about project design, implementation and management.

1.2 Mission activities

After a briefing at the UNDP/CDF Headquarters in New York on Tuesday January 16, 2001, the Mission Leader arrived in Asmara on Sunday January 20, 2001. The Team reviewed project related documents made available at Headquarters and at the UNDP mission in Asmara. Further desk review, briefing and preliminary meetings were held on Monday and Tuesday January 21 and 22. The team then went into the field on Wednesday January 23 to Massawa, Dahlak and then Assab, and returned back to Massawa and Asmara after ten days of stopping at project sites, meeting various stakeholders, including fishermen - individually as well as in groups - and Ministry of Fisheries staff involved in various aspects of the project. A key contact, the first National Project Co-ordinator, had left for the United States on a study mission and, by fortuitous coincidence, his replacement had just returned from the National Service. The mission schedule and a list of persons met and interviewed are given in the list of persons interviewed.

The Team circulated an Aide-Memoire prior to a wrap-up meeting held on Friday February 9, 2001 (15:00 - 17:00) where the Team was de-briefed by representatives of stakeholders from various United Nations Agencies and the Government of Eritrea. A presentation at this wrap-up meeting summarised the key findings and recommendations of the Team. A copy of this Power Point slide presentation is appended to the Aide-Memoire.

A Draft Evaluation Report was submitted prior to the departure of the Mission Leader from Eritrea at the request of the Deputy Resident Representative. Comments from those present at the wrap-up meeting were incorporated in a Draft Evaluation Report. The Draft Report has been further elaborated and reorganised into a Draft Final Report. In this Final Report comments by a reviewer from UNCDF are taken into account and answered. Key findings, shortfalls in design and implementation of the two projects and, from each of the components and activities, lessons

learned and opportunities for the future are all highlighted and presented, where feasible, in tabular form. All of these points, as well as those not addressed in the project document - such as systematic stock assessment and the adoption of a regime of fisheries management that is based on property rights - will be addressed in this Evaluation Report.

The structure of this Report is as follows: In the next section a background narrative to the projects is provided including an account of the regional oceanographic context. The Projects themselves are briefly described in this section starting with the long-term development objectives set by the GoE, the immediate objectives and the outputs; these are listed for each of the two projects. Also in this section is the critique and evaluation of both projects. Next, the implementation of the projects will be considered and issues of sustainability since their conclusion will be addressed. A self-contained evaluation summary is presented at the end of the document.

1.3 The Regional oceanographic setting

The Red Sea is a long (1950 km) and narrow (maximum width 354 km) semi-enclosed body of water. Ignoring the Suez Canal, its sole connection to the world oceans is only 29 km wide at Bab El Mandab. The average depth is around 490 m but reaches over 2 000 m in some areas along its axis. This Sea is

truly a unique marine environment located between two separating tectonic plates; it is a continuation of the African Rift Valley. The Red Sea has a high diversity of marine species as well as a high degree of endemism (the term refers to the occurrence of species that are not found anywhere else in the world ocean). Of the 1 248 species of fish that are found in the Red Sea, 171 (13.7%) are endemic. There are 220 species of corals, 120 bird species, 5 species of turtles and 8 species of cetaceans including dugong. Besides being more saline than the open ocean, the Red Sea has an unusual marine geology and chemistry - along its axis the deep trenches are filled with hot dense brine. Fish resources, at least demersal resources, are limited to the rather narrow continental shelf on both sides of the sea. The restricted shelf area, i.e. of less than 100 m depth, occupies only 41 % of the total surface area of the Red Sea and is characterised by coral reefs and other rocky outcrops. This geological feature severely limits the total area of the shelf where trawling is possible. The major trawling grounds are, in fact, in Eritrea's EEZ around the Dahlak Islands and on the east coast along the Yemeni shelf. Despite this, most of the coastal countries have at least some form of trawl fishery, not least Egypt - and more recently, Saudi Arabia - whose vessels have fished in Eritrean waters.

Eritrea's mainland coastline is 1900 km long; but when all 350 Eritrean islands are considered this figure goes up to 3 200 km. Eritrea has an EEZ that occupies 121 000 km², of which 56 000 km² (46%) is continental shelf area, the widest of any country along the Red Sea shores. The Dahlak plateau covers approximately half of Eritrea's continental shelf. Despite this large shelf area, trawlable grounds are limited to a few locations around Dahlak and further down the coast towards Ti'o. Nineteen percent of the shelf area is less than 30 m deep and thus, according to FAO's Code of Conduct for Responsible Fishing, should be off limits to trawlers.

Tropical reef ecosystems, which characterise much of the shelf area of the Red Sea, are anchored in very different fisheries production systems than even closely adjacent and superficially similar areas, such as the Gulf of Aden and the Arabian Sea along the Yemen-Oman coast of the North

West Arabian Sea. Whereas, in the latter, the monsoon winds drive the upwelling system leading to phenomenal seasonal productivity through simple and short food chains in the coastal environment of Yemen and Oman, productivity in the Red Sea is, on the whole, more autochthonous, i.e. locally and endogenously generated. A reasonable estimate is that less than one percent of the available energy in the Red Sea is converted into harvestable fish biomass. Much of the production in tropical reef systems is dissipated and

recycled among very complex food webs with a myriad of specialised organisms. Another oceanographic feature of the Red Sea is the so-called "evaporative pump". With no significant

rainfall or river run-off flowing into the Red Sea, water lost through evaporation under intense solar radiation is replaced by an inflow of water from the Indian Ocean through Bab El Mandab. As the monsoon season progresses, this influx - though advection - of nutrient rich water from the Gulf of Aden provides the additional source of high productivity in the Southern part of the Sea. The proximity of Eritrea's coastline and continental shelf to the Gulf of Aden and NW Arabian Sea explains the high fish productivity along the coast. Before the closure of the Suez Canal in 1967, Eritrea produced and exported over 25 000 mt of small pelagics (sardines and anchovies) for human consumption to Sri Lanka and for animal feed production in Italy.

Currently received estimates of Eritrea's fisheries resources are based on work done under a TCP by FAO in the year immediately following independence. A more recent survey (1997 -98) by the French Marine Research Organisation, IFREMER, has the following estimates:

⁴ Compare this system to the strongly seasonal - and phenomenally large - production due to upwelling along the Yemen - Oman coastline under the influence of the Monsoonal forcing of the surface water layer away from the coast. Nutrients in deep upwelled water are passed through a short food chain into a large biomass of fast growing small pelagic species.

8

***Ex post Evaluation of ERU92/001(UNDP) ERI/92JC01(UNCDF) and ERI/94/001(UNDP)
June 2001***

Resources	MSY in mt
Demersal fish	17 000
Coral Demersal fish	5 000
Small Pelagics	24 000
Large oceanic pelagics	6 000
Sharks	5 000
Shrimp	500
Lobster	500

It is significant to note that no estimates of stock abundance or distribution or other quantitative analyses have been prepared by the Ministry of Fisheries unit (Research and Training) though some staff have had some training and experience.

Large migratory pelagic fishes such as tunas and kingfish enter the Red Sea from the Gulf of

Aden and form 'straddling stocks' with distribution areas under the jurisdiction of several countries requiring a regional approach for their management.

2.0 Project concept and design: Objectives and Outputs

The two projects evaluated herein were conceived and designed as the transformation of Eritrea after the 30-year war of liberation was being organised. A sense of urgency pervaded most planning activities during this transformation against a background of almost total destruction of the country's infrastructure, of acute malnutrition, population dislocation, political uncertainty and an acute shortage of skilled labour and managerial capacity. The fisheries sector, having been long abandoned, provided opportunities to fulfil many of the development objectives of the government of the day, the Provisional Government of Eritrea (PGE). Thus the development objectives and outputs of the Semhar Fisheries Rehabilitation Project, listed in section 2.1 below, mirrored very closely the long-term development objectives articulated at the time by the PGE. As the project was underway, and after the stakeholders recognised the lack of technical and managerial skills, the second project, Capacity Building for the National Marine Resources Programme, was formulated and started in 1994. The objectives and outputs of this project are listed in section 3.1 below.

2.1 Semhar Fisheries Rehabilitation Project

2.1.1 Development objectives

The Project Document (PRODOC) set out to fulfil a broad range of long-term objectives that were intended to:

1. "Improve the incomes and quality of life of the fishing communities, for whom fishing is the sole economic activity;
2. Increase the supply of fish, a valuable source of protein, at least to the urban areas, where the nutritional status in general is below desirable standards;

9

Ex post Evaluation of ERI/92/001(UNDP) ER11921C01 (UNCDF) and ERI/941001(UNDP) June 2001

3. Generate foreign exchange by promoting export of those fish or marine products for which no domestic market exists;
4. Support and strengthen national fisheries institutions in the public and private sectors to promote selfsufficiency in national fisheries management."

2.1.2 Immediate objectives

The immediate objectives of the Semhar Project were:

1. "Rehabilitation of the fleet to support fish production by ensuring an adequate supply of scarce fishery inputs.
2. Improvement of Fish landing and Distribution by providing a range of services to the Massawa / Dahlak artisanal fishing industry.
3. Improvement of Social Infrastructure to improve standards of living in the fishing villages (

- on the Dahlak Islands).
4. Strengthening of the Fisheries Department (now the Ministry of Fisheries) by establishing a Project Implementation Unit (PIU) within the Department."

2.1.3 Outputs

The outputs in the Semhar Project were the following:

1. "Rehabilitated fishing fleet: At project completion the total number of vessels in the Dahlak / Massawa gillnet and handline fisheries' would have increased from 70 to about 85.
2. Increased employment: The number of active vessel owners would increase through the project form about 70 to about 85, while the number of crewmen employed would rise from about 350 to almost 500. About 40 new jobs would also be created in the fish distribution and retail trade.
3. Increased Income: Mean annual crewmen's income would rise as a result of the project from an estimated \$1,400 to \$2,200 (in local currency).
4. Strengthened Fishermen's association: By the end of the project period, the association would be expected to have evolved into fully independent entities, capable of managing their own finances and of making their own investment decisions in the future.
5. Improved availability of fish on the domestic market: The supply of fresh reef and large pelagic fish to domestic markets in Massawa and Asmara would be expected to increase from about 600 tonnes to about 1,100 tonnes.
6. Increase export earnings: The value of fish products (mostly dried shark and shark fins) to be exported is expected to exceed US\$ 1.3 M p.a."

2.2 Capacity Building for the National Marine Resources Programme

While the Semhar Project was underway much physical infrastructure was being constructed for the fisheries sector. In the meantime, recognition was emerging among GoE personnel and the United Nations Agencies overseeing the project that technical and managerial skills needed to be developed in the Ministry. Rather than add those to the already over-extended Semhar Project (operating 6 - 12 months behind schedule), a new project, more closely focused on human and institutional capacity building was formulated to meet these long-term needs.

2.2.1 Development objectives

The long-term development objectives of the Capacity Building Project were to:

10

1. "Develop programme planning, managerial, monitoring and coordinating capacity and to ensure the effectiveness of key Ministry functions.
2. Develop fisheries research and coastal environment assessment and monitoring capacity to ensure long-term sustainability in the exploitation and conservation of the resource base;
3. Strengthen marine resources related institutions in their capabilities of promoting, coordinating and monitoring an expanded but carefully planned and managed sustained development of the marine resources sector;
4. Develop training and extension services through on-the-job training, formal classroom skill

- development and the development of government extension workers to assist fishermen to improve the technical and economic effectiveness of their work;
5. Develop a core of effective and control capacity for ensuring compliance with fisheries and environmental regulations."

2.2.2 Immediate objectives

The immediate objectives of the Capacity Building Project were the following:

1. "Re-structuring of the Ministry planning and coordination functions to make it fully operational.
2. Establishment of a statistics and information network, including databases, documentation facilities.
3. Designing management policy frameworks and strategies for small-scale and industrial fisheries, including licensing and other access arrangements."

2.2.3 Outputs

The outputs of the capacity Building Project were the following:

1. "A streamlined/re-organized Ministry of Fisheries (previously known as Ministry of Marine Resources).
2. Fully trained personnel to undertake such activities as project planning and design, sector long term planning, co-ordination or externally funded activities, co-ordination with other ministries, statistics, monitoring and evaluation, environmental research and assessment and administration.
3. Fully trained personnel to run branch offices involving programme and project management, technical assistance to fisher folk, new project development and administration
4. Establishment and operation of a Credit Scheme, which is one of the main functions of the cooperatives."

2.3 Critique and evaluation

- Responding to the exigencies of the time, the objectives listed in the PRODOC were closely aligned with those articulated by the PGE in that the domestic market was to take precedence over exports. The latter were to come from the surplus of the catch not consumed in the domestic market. Export markets, however, have traditionally accounted for a large fraction (up to 85%) of Eritrea's fish production. Based on nutritional needs, the expectation of consumption in the domestic market may have been over-estimated in the project design.
- The PRODOC (section 3.2.2 Development Context and Design Considerations) states that "the PGE expressed its wish to launch an emergency programme for the rehabilitation of the fishing industry; that is, the requirement for a style of development which will, within the confines of biological sustainability and financial viability, produce quick tangible results. A large broadly based programme of fisheries development would, given the poor information base, take too long to prepare in order to be consistent with the PGE's requirement for an emergency programme and nor would

use of skills, institutional framework (FA), technologies and vessel designs already available in-country, and which would, in the first instance, develop and rationalize existing markets rather than create new ones." [Italics added]

- Appropriate as it was for the time, the above quoted approach turned out to be, ex post, somewhat on the optimistic side. With good reason, the Fishermen's Associations (FAs) were not very popular among fishing communities having been imposed previously by the Ethiopian authorities as means political control of the fishing communities along the coast. We should add, however, that general attitudes of coastal fishing communities towards the fishermen's co-operatives have changed to the strongly favourable due, in large part, to the dedication and hard work of many ministry employees in providing services through the Credit Scheme. These FAs however, are not yet fully able to manage their own business affairs without help from the Ministry of Fisheries (Extension and Co-operatives Division).
- The Project was engaged in a wide range of activities all very important to the sector but lacked a single strong focus; thus both the project and the Chief Technical Advisor (CTA) may have been spread too thin. Engaging in a wide range of activities over a large geographical area was justifiable in part because so much of the infrastructure was destroyed everywhere that everything needed to be restarted from nothing, as it were. As the scope became obvious at the first TPR the second project (capacity building) was started.
- The match between the project's breadth of activities and the CTA was perfect. The FAO fielded the ideal CTA for the multitude of tasks then at hand. Project administration, however, was rather weak. Financial reporting was evaluated by previous project review mission and was found to be on the weak side (a relatively small discrepancy went unreconciled). The Evaluation Mission wishes to stress that no misuse of funds was ever suspected of anyone by anyone. To illustrate, it was not feasible to get a clear financial picture of the project easily and expeditiously, such as disbursements to specific line items. No procedures were in place, for example, that would authorise the transfer of funds from one line item to another. Much of this could now, and in the future, be accomplished with inexpensive accounting software packages and the proper training to use them.
- The size of the domestic market was over-estimated at the outset and was based on the optimistic assumption that national shortfalls in nutritional needs, particularly for protein, would be filled by the fisheries sector once the infrastructure was rehabilitated in the Massawa and Dahlak. Distribution and marketing were addressed to the extent of purchasing refrigerated trucks and building retail shops in Asmara and Massawa. Overlooked were the consumption patterns of protein and fact that such needs do not automatically lead to an effective demand for fish, that is demand backed by food preferences and purchasing power. However, a promotion and marketing campaign was later launched with a good deal of success so much so that the supply of fish to the domestic market, especially to individual consumers in urban areas remains below demands. We will come back to marketing, as it is a critically important link between the fishermen and the domestic consumers for the future.
- The extent of the informal trade links between Yemen and the fishing communities in Dahlak and all along the coast were not systematically investigated or, at least, underestimated. There is a large market in Yemen and, to a lesser extent, in Saudi Arabia that Eritrean fishermen have relied on over the past 30 years to sell their catch and purchase their fishing inputs - as well as host of consumer

s Institutional buyers such as hotels and restaurants, on the other hand, appear to be well supplied.

items - on the return journey. This dependence became obvious with mixed results during and after the Hanish Island conflict with Yemen, which halted for a short period the existing trade exchange. On the one hand, more fish became available in the domestic market but ex-vessel prices were depressed. The domestic market in 1995 was not large enough to absorb the catch. With the combination of dependence on a single large market nearby and the relatively small size of the domestic market, the fishermen lost an important source of revenue and many were unable to pay their loans from the revolving fund. Another factor was the devaluation of the local currency that reduced access to regionally purchased inputs such as spare parts. As a result of all these factors loan repayment rates are low but appear to be picking up now.

- Underestimated was the level of difficulty of some construction projects, especially the jetty on Dahlak Island that required underwater construction skills not available in Eritrea at the time. Later a substitute and rather novel design was adopted using containers filled with concrete.
- The use of skills, institutional frameworks, technologies and vessel designs already available in the country may have been the appropriate approach, but these elements were either mistrusted (like the FA's) or severely depleted. Traditional boat builders had for the most part left Eritrea and skilled labour in engineering and maintenance were in short supply.
- The quantitative verification of other outputs, such as the socio-economic conditions of fishing communities, while much improved, has been confounded by lack of systematic socio-economic surveys before and after the project. Another confounding factor has been the recent border conflict. As a result of this conflict with Ethiopia many participants both in the government as well as in fishing communities were called to the National Service. This clearly had an effect on income generation as a major source of livelihood was scaled down.
- At the outset, the Logical Framework Approach (LFA) was not applied in the process of producing the original PRODOC. This may have led to confusion and overlap in the logical structure of objectives and outputs, which are used sometimes interchangeably. Clearly articulated long-term *development objectives* are achieved by meeting *immediate objectives*, which, in turn, require the completion, according to a chronogram with milestones and time lines, of *project activities* that require project *inputs*. For example references to increased incomes, increased employment, more availability of fish and a better understanding of the fisheries sector are better targeted as objectives rather than outputs of the project. In fairness, however, it may well be that such tools were not as widely used in 1991 as they are now a decade later.
- The PRODOC did not address a Monitoring and Evaluation system. Such a system provides a means of measuring the progress of the work plan using pre-determined means of verification, currently referred to as Key Performance Indicators (KPI's). Though indicators could be agreed upon as outputs were produced, their means of verification, or how *well* they were done, were not articulated.
- Despite the above critique, the original PRODOC correctly focused on the delivery of the most essential of requirements to revitalize the fisheries sector: a basic infrastructure of landing facilities; refrigeration and chilled transport for marketing; boats, engines, spare parts and repair facilities for harvesting.

⁶ Domestic consumption is currently around 350 - 500 mt, or about 25-30% of the artisanal production. Retail prices of fish (Nfa 13/kg) compare favourably with current prices (May 2001) of alternative sources of protein (Nfa 30 - 35/kg for meat), which have been increasing recently. This would suggest an increase in domestic demand for fish might be underway from the current per capita consumption of less than 1kg/yr. A systematic programme of data collection in the marketing and consumption would answer this question.

- The Capacity Building Project suffered from the same interchangeability of objectives and outputs referred to in the Semhar PRODOC as well as the same optimism. Fully trained personnel capable of undertaking sector-wide planning, co-ordination and implementation of projects is a good long-term objective, but hardly an achievable output given the starting technical levels and the time frame of the project.
- The following two tables show the most recent figures supplied by the Credit and Co-operatives⁷ unit of those directly and indirectly connected to the fisheries sector in project areas:

Fishing area	Population	Number of fishermen	Members of co-operatives	Number of families
Dahlak	2 218	506	122	512
Massawa	20 485	298	278	5 382
Gal'allo	24 594	676	253	5 597
Ti'o	4 220	313	208	NIA
Assab	25 000	853	313	NIA
Total	76 537	2 646	1 174	

Occupation	Massawa	Assab	Dahlak/Ti'o/Gal'allo	Asmara
Mechanics	10	10	0	20
Boat builders	20	9	1	30
Retailers	5	1	0	6
Wholesalers	N/A	1	0	1
Processors	100	N/A	0	50
Total	135	21	1	107

3.0 Project implementation

3.1 Status and performance of input

delivery 3.1.1 Semhar Fisheries

Rehabilitation Project

- All inputs had been delivered by the closure of the project according to documents issued by the Ministry of Fisheries. Progress reports submitted at various points by the CTA reveal delays (up to one year) largely due to logistical difficulties such as availability and procurement of lumber for boat

⁷ I am grateful to Mr. Yosief Kahsay for providing these, as well as other, figures. The Ministry of Fisheries has 216 staff working throughout the project area but the total number of civil servants indirectly connected to the fisheries sector is given as 850.

14

Ex post Evaluation of ERI/92/001(UNDP) ERI/92/C01 (UNCDF) and ERI/94/001(UNDP) **June 2001**

building, availability of skilled labour as well as others. Procurement of imported inputs was particularly problematic given the hard currency implications of such transactions.

- Each of the components of this project had its share of delays and constraints. The Dahlak Fisheries Centre, like the rest of the Island, does not have a reliable supply of fresh water. The desalination plant operates at half its nominal capacity due to lack of spare parts. This is a serious problem that continues to hinder the development of fishing communities on the Island. The Interim Report (1998) gives some details of attempts to solve this problem. Largely due to the national emergency and the border conflict, these attempts and suggestions came to naught.
- The large geographical separation between Massawa and Assab and the difficulties in communications meant that these two components could not be co-ordinated as well as they might have been. In particular, interdependence with other donor projects such as JICA in Assab required yet another level of co-ordination of input delivery and timing.
- Since the closure of the two Projects, the mission looked at sustainability of activities, and hindrances thereto, and found - not unexpectedly - that the border conflict has had a severe impact on almost every facet of project activity. Many able-bodied men and women in the Ministry of Fisheries, as well as from fishing villages, were called to the National Service. This fact has had a confounding effect on the mission's ability to evaluate the extent to which sustainability has been achieved. Notwithstanding this effect, some critical lessons could be learned. The good news is that a few have been discharged and have returned to their duties and the prospects of many more returning appear to be growing steadily.

The PRODOC had several components listed below.

- Component 1: Rehabilitation of the Fishing Fleet. Boat refurbishing and building new boats.
- Component 2: Improvement of Fish Landing and Distribution (i) Massawa Fisheries Centre:
3 piers

Slipway
 Store building (at slipway)
 Multipurpose building
 Roofed area
 Ice plant (containerised, 8 t
 per day) Water supply
 Fuel and gasoline supply as three 15 cubic metres storage
 tanks. Workshops
 Administration/Retail Shop/Fishermen's Accommodations

Dahlak Fisheries Centre:
 Marine Works
 Water supply
 Fuel (one 15 m³ tank) and gasoline (two
 15m) tanks Administration building
 Net mending shed
 Pump/generator house
 Workshop

15

Ex post Evaluation of ERI/92/001(UNDP) ERI/921C01(UNCDF) and ERI/94/001(UNDP)

June 2001

Fish Distribution:

The project's support of fish distribution included the provision of four insulated 1.5 tonne pick-up trucks to transport fresh fish from Massawa to Asmara. In accordance with the PGE's policy of privatization, the DMRIF was to transfer the distribution of fresh iced fish to private sector traders. A financial analysis is given in the PRODOC (annex 8, tables 12 and 13) that are based on the price structure prevalent at the time projecting an increase in the tonnage transported from 150 mt to 1,300 mt in 5 yrs or by the end of the project.

- Component 3: Improvement of Social Infrastructure Targeting 5 fishing villages the PRODOC was to support:
 - overhauling and restoring of the desalination plant on Dahlak Island
 - building new clinics and schools on the Islands of Dahlak, Duhel, Norah
 - construction of a multipurpose building in Massawa; and
 - building new fish retail shops in Massawa and Asmara.
- Component 4: Support to the Fisheries Department
 This was to be done through technical assistance, training and the provision of essential equipment (such as computers) during the project implementation. A small unit, the Project Implementation Unit (PIU) was to be set up with the (then) DMRIF in Massawa to operate the project. It was staffed with a local project manager assisted by an expatriate chief technical advisor (CTA) during start-up period (2 yr) and other technical assistance (TA) personnel. Four Assistants, two accountants, drivers and secretaries were to be recruited by the project for each fisheries centre. A locally recruited consultant was to be appointed for three months to prepare detailed designs for the project civil works facilities and the tender documents by which the government would evaluate the bids, award the contracts and supervise the works.
- Also during the start-up phase consultancy services were to be called upon to provide a broad spectrum of baseline data on the fishery sector, the National Fishery Surveys Programme.

These consultant services were to provide assistance in the following disciplines: Product handling/quality assurance,
Fish marketing,
Boat building,
Civil works,
Socio-economic survey,
Extension and training, and
The National Fisheries Surveys Programme (NFSP)

Implementation Responsibilities

In the original PRODOC the implementation responsibilities were allocated as follows: "**Government:**

The PGE will carry the global responsibility for project execution. *Line departments whose responsibilities cover specific fields of expertise of direct relevance to the project, such as Health, Construction, Education, Public Administration, will each undertake specific responsibility for the relevant element of the project, and in the long term ensure its operation and maintenance. Their involvement will be sought and co-ordinated by the DMRIF, which the lead agency for the project on behalf of the PGE.* [emphasis added] In carrying out their obligations, these authorities will:

- be responsible for promoting awareness amongst the population in the project area of the existence of the project and its means and objectives;

16

Ex post Evaluation of ERI/92/001(UNDP) ERI/9VC01 (UNCDF) and ERI/941001(UNDP) June 2001

- ensure the availability of local personnel requirement for the establishment and maintenance of equipment and infrastructure built by the project, as well as ensure the participation of the local communities in the maintenance and well being of these structures;
- prepare, in collaboration with project experts, the project implementation reports and the bills of bidding as required and forward them to UNCDF and UNDP for approval;
- inform UNCDF and UNDP of all delays or impediments related to an increase in project costs; and
- participate in the project reviews and ensure that independent participation of private expertise in the auditing of the project's accounts.

Fishermen's Associations:

The project implementation was to be carried out by the FAs through the Project Implementation Unit. The FA's will ultimately be responsible for the management of all fishing infrastructure such as the store, the multipurpose building, ice plant and workshop. Public facilities such as piers, and slipways would remain under official authorities. The FA will also be responsible for leasing of transportation and market outlet facilities (trucks, fish markets and cold storage) to be provided under the project. Responsibility for allocation of credit and identification of beneficiaries will also be that of the FA's.

Project Implementation Unit (PIU)

At the outset, the PIU was seen as temporary substitute for the lack of organised fishermen and traders and would arbitrate the process of letting the FA ultimately own the project. Thus the PIU was envisaged to assist the FA in:

- construction/rehabilitation of fishing infrastructure (designs, floating of bids, monitoring of

- construction activities);
- establishment of the capital fund. Provision of inputs to be financed from the fund, such as repair material, spare parts etc.
- operation of the credit lines. Pending establishment of a banking branch in Massawa, the PIU will monitor the reimbursement of loans in local currency and undertake all legal steps in respect of credit recovery of loans under the control of the FA;
- the PIU will also assist the FA in the preparation of leasing procedures for the distribution and marketing outlets.

The PIU will be aided by a national Project Director, recruited and financed by UNDP and assisted by a CTA during the first two years.

UNCDF

The PRODOC set UNCDF's financial commitment of US\$ 2,943,120 (this figure was later revised upwards). An annex in the PRODOC gives detailed financial allocations to budget lines as well as the disbursing agent concerned. For example one set of budget lines were to be disbursed through the co-operating agency (FAO), others by the Resident Representative of the UNDP.

UNDP

In the PRODOC the UNDP was to finance the technical assistance and the cost of vehicles and office furniture and the PIU, and the operational costs as required. The UNDP Liaison Office represents the UNCDF in Eritrea and was to be, therefore, responsible for the co-ordination of all external inputs required by the project. The incumbent in charge was to follow the project closely in collaboration with the Government and the UNCDF in order to take the necessary action required to overcome all the obstacles for successful implementation of the project. He/she was also responsible for the disbursement of funds on behalf of the co-ordinating agency according to UNDP financial rules and regulations.

17

Ex post Evaluation of ERU92/001(UNDP) ERI/921C01 (UNCDF) and ERI/94/001(UNDP) **June 2001**

FAO

FAO will be the agency assisting in the implementation of the technical assistance component of the project financed by the UNDP and the co-operating agency in respect of inputs financed by the UNCDF. It will provide expatriate experts and prepare the necessary documents for the purchase of equipment and/or materials.

Fishing Communities

The PRODOC estimated that 50% of the project production would be exported and proposed that after the first year, private traders would be assisted by the Commercial Banks and the Central Bank in progressively importing and retailing fishing vessel inputs. Selling prices could be verified against suppliers' invoices in foreign currency and converted to local currency at the official exchange rates. After an examination of suitability and capability, including financial position, these private dealers would be authorised by the Department of Finance to carry out the task on their own. *[No further details are given in the PRODOC] "*

Plan of operation:

A plan of operation was drawn up in tabular form (Annex 2 of the PRODOC). A time frame was projected during which each of the basic project activities could reasonably be concluded. This projection was based on the assumption that during the first 9 months recruitment of the technical assistance team, delivery of vehicles (for project and credit sale use) and arrival of all imported goods will have been accomplished. Furthermore, the time-line allocated one year for the completion of all civil works and procurement of equipment for the fisheries centres in Massawa and Dahlak.

Effectiveness of the implementation arrangements:

The arrangements outlined above are straightforward. However, by the time the first Tripartite Review Meeting convened on June 12, 1994, the following decisions and recommendations had been made:

- Additional funds were allocated to cover construction costs of necessary infrastructure that were originally under-estimated.
- The addition of the Assab component to the project vastly increased the geographical reach and the complexity of running it. Additional funds had to be allocated by the UNDP and the UNCDF.
- Posts for an Assistant to the CTA and an Associate Expert, stationed in Assab, had to be created and funded.
- An extension services network was seen as necessary and thus was established.
- A fish consumption promotion campaign was added to the project.
- It was recognised during this TPR meeting that the DMRIF lacked the requisite skills and so the Capacity Building Project was to start as a separate sub-project.
- Outputs related to the educational and health services on Dahlak were dropped from the project.

3.1.2 Capacity Building Project

- The Capacity Building Project was started after it became evident that the scope of the Semhar Fisheries Project was too broad and that the skills for managing the complex tasks of developing the sector were in short supply. The project focus addressed three areas:
 - Programme planning, management and co-ordination capacity to ensure the effectiveness of key Ministry functions;
 - a statistical and information system for marine resources; and
 - a resources management policy and legislation.

- The implementation of this project was delayed at the outset due to late arrival of the CTA.
- The reorganisation of the Ministry of Fisheries was completed after this project had started.

- The economic monitoring activity did not come to fruition as the officer assigned left the project after six months.
- The Policy and Planning Unit which was to initiate and co-ordinate external technical assistance was absorbed by the Office of Macro Policy and International Co-operation.
- The Project funded a bio-statistician who helped the Ministry set up a Local Area Network and a fisheries data management system.
- A training officer drafted a sectoral training plan under the Project. However, because it coincided with a nation-wide Human Resources Development project at the University of Asmara, this plan was modified and folded into the HRD project.
- A documentation centre was established under this project and some texts were procured. The team was unable to see this library but progress continues to be made in building it up.
- A document on Integrated Coastal Zone Management (ICZM) was drafted under this project but subsequently folded into the GEF project.
- The Ministry acquired under the project some badly needed items like vehicles, copiers, computers, and audio-visual equipment, a satellite dish *inter alia*.
- The major shortfall of this project was a perception that technical assistance was not accomplished. This may have been a result of a perceived or real mismatch between the CTA and the expectations. The CTA was terminated half way through his 2-year appointment.
- Another misconception may have had to do with expectations of the degree and level of expertise that can be reasonably transferred to staff through day-to-day contact with the CTA.

3.2 Project reporting, monitoring and evaluation

These functions were addressed by the following paragraph quoted from the PRODOC: *"The DMRIF, assisted by the technical assistance personnel, will be responsible for the monitoring the execution of the project against a detailed work plan to be prepared the Project Manager and CTA, co-Manager during the start-up phase of the project. Progress reports will be submitted every six months to UNCDF and UNDP, to form the basis of a continuous assessment of project evolution. Technical reviews will be undertaken by a UNCDF Technical Advisor at least once a year."* [Italics added]

A shortfall of both projects is that despite the above, neither had further explicit provisions for monitoring and evaluation at pre-determined milestones of activities as they were carried out. The tripartite meetings provided the closest forum for such reviews but were not held at a frequency that allowed close monitoring of the progress made by either project. It was possible, however, at least for the Semhar Project, to get a reasonable picture from the regular reports submitted by the CTA. These reports show that the project was behind schedule six to twelve months. In the opinion of the mission many of these delays were unavoidable.

4.0 Evaluation of Project Outputs

4.1 Project

impact 4.1.1

Semhar Project

- The Semhar Fisheries Rehabilitation Project has had a large and positive impact on the fisheries sector in Eritrea on a national, regional and local community scale. In September 1993 only 200 to 300 mt were landed, whereas over 1400 mt were landed in the year 2000. Starting from almost a totally destroyed infrastructure there is now a healthy functioning fisheries sector that employs all fishermen who wish to engage in fishing (around 2000 in total). In addition there are likely half as many engaged in some form of fisheries related employment. The main verifiable outputs of the projects, increased supply of fish, increased employment in the sector and increased quantity - as well as improved quality - of exports are observed facts now. Cold storage capacity has increased to 30 mt (from nil at the start of the project) and the rejection rate of first quality fish was reduced from 40% to 10%. In the case of other outputs, such as improved socio-economic conditions of fishing communities, while much improved, their quantitative verification has been confounded by the lack of systematic socio-economic surveys before and after the project. Another confounding factor has been the border conflict as a result of which many participants were called to the National Service. This clearly had an effect on income generation in project areas as a major source of livelihood was significantly scaled down.
- The project provided a (life) line of credit to construct and rehabilitate much needed infrastructure (such as landing facilities, cold stores, ice plants, office space and retail outlets) for the whole of the fisheries sector in Eritrea. The project also provided funds to procure refrigerated trucks. As well, the project set up a revolving fund that procured much needed input (such as boats, engines, nets and other fishing gear) to fishermen under a credit scheme. A boatyard in Massawa with workshops for the refurbishment of existing and salvageable boats as well as repair and maintenance for newer ones was also set up.
- The quality of fish exports now conforms to EU standards and Eritrean fish products can now be found in fish markets in Western Europe ⁸. There are three major fish exporting companies - LEDA, Erifish and Red Sea Fisheries - that operate out of Massawa and Asmara. The expected opening of the Massawa Airport will undoubtedly open new fast channels for export. There is an emerging and a sophisticated market for fish products in Eritrea with higher potential returns if value added processing is adopted as an industrial strategy.
- The activities flowing from these two projects in succession constituted the core of the nascent Department of Marine Resources and Inland Fisheries (DMRIF) thus dramatically transforming and restructuring itself into the present Ministry of Fisheries (MoF) with a dedicated and motivated staff in credit and extension services to fishermen's co-operatives; in quality control and inspection; in licensing, in monitoring, control and surveillance (MCS); in information management and in research & training.

The Massawa Fisheries Centre

- This is the cornerstone and key contribution of the Project to rehabilitate the fisheries sector in Eritrea. The Massawa Fisheries Centre is the focal point of the fishing industry in Eritrea. The

⁸ Anecdotal, one former project consultant has purchased Eritrean fish in a London fish market.

staging area is sheltered and well supplied with water, a containerised ice plant producing block and flake ice, chill rooms, generators, truck loading area, fuel pumps etc. The project has helped construct many civil works including office facilities for private companies, Ministry of Fisheries staff and the Semhar Fishermen's Cooperative Society (SFCS). The Project has also contributed to the construction of another landing facility nearby. This one is now privately owned (by Beilul Fishing Fleet) and it operates alongside the Massawa Fisheries Centre landing facility. Unloading of fish at the Massawa Fisheries Centre is now organised into two periods (06:00 to 09:00 and 17:00 - 20:00). The flow of work at the landing facility has meant that turn-around time at the port facility has been dramatically reduced for fishermen with the effect of giving them more time to spend fishing.

The question now is how is this facility to be sustained? The current facility is managed by the SFCS and receives fish from the industrial fleet as well as the artisanal fleet. It operates now at near capacity and a new additional facility for the artisanal fleet may not be far fetched as a reasonable near-term objective. The idea of an independent (para-statal or arm's length?) Port Authority was mentioned as a possible future institutional option that would provide fee-based services to members of the SFCS. Recovery of operating costs (but not capital investments) would be part of the mandate. This suggestion, however, must be thoroughly evaluated against other alternative options of collecting the catch and providing facilities.

A fish auctioning system has not yet been installed in Massawa though proposed by previous review missions. An auction system is the most likely to foster competition and to ensure that a fair share of gains from delivering high quality fish go to fishermen and not only to intermediary traders.

- **The Dahlak Island Fisheries Centre**

The difficulties of construction of a fish-landing site on Dahlak Island were not foreseen at the time the PRODOC was drafted. These difficulties were in engineering design and construction expertise; they were not available in the country. Though behind schedule, a jetty constructed ultimately out of containers filled with re-enforced concrete is now in place. Other facilities, such as a cold store, though in place, are not operational due to a variety of limitations such as the reduced capacity of the desalination plant, lack of power, and lack of skilled and unskilled labour. The call to National Service is partly responsible for the latter shortage on the Island. The Ministry has a plan to finish the ice plant that will be phased in after shortages of fuel and water on the Island are addressed first.

Very little progress has taken place on Dahlak Island since the mid-term evaluation other than building shelters for a workshop and a store, both still under construction. The slow pace of development on Dahlak Island may be seen as representative of the disparity between the artisanal and the industrial components of the fisheries sector. Even though the GoE's policy is to encourage the development of the artisanal fisheries sector (e.g. the newly proclaimed law

concerning the cooperatives), there is the appearance of a shift towards favouring the industrial side of the sector. The policy of the GoE, however, is clear in that it will rely on the artisanal fleet to harvest most of the Total Allowable Catch, while the trawlers operate only with short-term permits. The artisanal sector lacks skilled manpower as well as ready access to a distribution and marketing network.

- **The Massawa Boat Yard**

Though this yard has met its quota of boats to build, in its current state the Massawa Boat Yard is neither viable nor sustainable. The wooden boats built there under the project are beached because of design and materials flaws. Not very maneuverable, local fishermen did not want to use these boats, preferring the more easily handled Fiber Reinforced Plastic (FRP) boats. The originally assigned role of boat production for this yard was based on the assumed availability of returnees who had boatbuilding skills. This may have been too optimistic as boat building is not a well-established tradition

in Eritrea (as compared to Yemen for example). A baseline survey in 1992 showed that 90% of Eritrean fishermen purchased their boats from Saudi Arabia and Yemen.

The equipment in the machine shop is past its useful life and the management of the Yard is not efficient. There are, for example, no job costing procedures, nor is the inventory of parts well administered. There is a shortage of skilled labour in the Yard and no boats were observed under construction at the time of the visit. About half the staff is away for their National Service.

This mission concurs with previous project reviews that demonstrated that the Massawa boat yard has not played its intended role and perhaps a new one is required.

While in Assab the evaluation team visited the Harena Boat Yard on Haleb Island, a joint venture between the GoE and a private Australian boat building company. Though their numbers have changed, there are now five expatriate experts there that have transformed the yard into a vibrant productive facility that built 45 world class RFP boats of various sizes over three years despite two dislocating evacuations. The facility is well managed and most of the actual work is done by a skilled Eritrean work force that includes quite a few women. As this facility is poised to increase its production and sales in the region, the Massawa Boat Yard can play an important role as a satellite or a subsidiary to the Harena Boat Yard on Haleb Island a role that is dedicated to boat repair and maintenance. This new orientation will go a long way towards organisational and managerial capacity building in the Massawa Boat Yard and will have a major positive impact on its operations. In this new incarnation, the Massawa Boat Yard will have to undergo major redesign and reconstruction of civil works and some boat lifting equipment will have to be procured.

- **The Massawa Refrigeration Facility (REFCO)**

This is a parastatal semi-autonomous entity that is a good candidate to become a fully independent private sector concern. REFCO's manager has a degree in business administration. REFCO has installed the refrigeration equipment for ERIFISH, five retail outlets, and the chill room on Dahlak Island, the microbiology laboratory and LEDA's refrigeration plant. It has 15 trained refrigeration technicians though about half are away

fulfilling their National Service. The facility also takes on repairs of refrigerators and air conditioners from the community at large and is in a positive cash position.

The facility can benefit from establishing and maintaining accounting procedures that show its financial position more accurately. Much repair work done by the facility is not paid for because it is done at other government facilities. Though capable of purchasing one, the facility does not have a vehicle of its own. The facility can truthfully claim that no fish spoiled because of breakdown of equipment installed and maintained by its technicians.

The manager would also like to have an in-house facility to upgrade the skills of his technicians, and have more advanced and specialised training abroad for those with proven promise.

- **The Fishermen's Co-operatives**

There are now 1174 fishermen that belong to 37 primary village level co-operatives in 29 villages with 8 secondary or apex co-operatives. Co-operatives have now become legal entities that can engage in commercial activities. This recent development offers an opportunity for the co-operatives to make a difference in the lives of their members and their communities. Much groundwork has to be done, however, in capacity building of the co-op membership and ranks. Though the idea of cooperatives is now accepted after initial resistance, the notion that a co-operative is not an entity separate from its membership is still a novel one and many fishermen regard the co-op as something distinct and as a means of access to resources.

22

Infrastructure facilities are still lacking or incomplete in areas where the fishermen's primary co-operatives are located (Dahlak, Ti'o, Bar'asole and 'Eddie). In these areas, as well as in Assab, these facilities are inadequately designed and constructed.

If the new mandate of the UNDP and the UNCDF is poverty reduction through improved local governance and revenue generating activities, then the fishermen's co-operatives offer the perfect target for capacity building⁹. As things stand now, the profit margins of fishermen are quite low and they are price takers. The exporting companies purchase from fishermen only first category fish (groupers, snappers, emperors and kingfish) paying a fixed price. Under the new law, co-operatives can provide fishermen a chance to improve their negotiating power and enter into the marketplace cooperatively to sell all of their catch. The co-operatives can now enter into contracts to purchase inputs as well process and sell their product on the market. They also can purchase and sell consumer items for their members.

Concentrating on high returns to investments, the fish processing companies have focused on exports earning much needed hard currency. However, the domestic market is not well supplied with fish when compared to alternative sources of protein. On the domestic market large retailers have concentrated on the large easy accounts such as hotels and restaurants. Access of individuals and families in urban areas to fish products remains limited to two retail outlets whose supply is uncertain. Co-operatives can focus on the domestic market where a potential exists for marketing their catch. Only when the Co-operatives have developed a level of skill in the local market can they hope to graduate to the regional and international marketing arena.

Rewards and incentives have to be in place to manage co-operatives and their finance and administration abilities have to be improved. This is institutional capacity building with a sense of urgency.

- **The Assab Fisheries Centre**

The background against which development of fisheries in the Assab area takes place is that the natural market for fish is Yemen, not Eritrea. The size and geographic proximity of Yemen as a market as well as the availability and price of inputs there continues to hamper development in Assab. The Assab Fisheries Centre was fraught with protracted delays, lost machinery, work delivery below specification and termination of contractors as well as the lack of a marketing and business plan.

The Project provided in April/May 1997 a seed fund of USD 15 000 to investigate fish marketing outlets and to identify reliable fish traders who were interested in learning the complex nature of procedures to export fish products. This was met with enthusiasm and success but then the border conflict put a halt to fish exports, particularly to Addis Ababa.

- **The Bar'asole Fisheries Centre**

The team visited this community of 660 people about half of which are fishermen (295) that own equipment to fish; many more don't have any gear or boats. This community is a good example of the problems that beset the fisheries development along the remote Eritrean Coast. It takes three hours of driving on a rough road to reach the village from Assab and an equal length of time by boat. The Yemeni coast is six hours by boat and frequently ice is purchased there in preference to the ice available in Assab (120 blocks per day of low quality ice). The workshop where boat repairs are undertaken is low on spare parts as well as short of skilled labour. There are no skilled carpenters to

⁹ Some recent work (Pretty and Ward, 2001) documents the importance of human and social capital in promoting favourable environmental outcomes.

repair wooden boats. The village has a brackish well and must get its water from 30 km inland. There are plenty of fish to catch for the fishermen here, but Bar'asole is limited by lack of essential facilities such as landing and by a reasonably easy access to markets. The team became aware of a project currently underway, funded by the African Development Bank (AfDB) that seeks to establish three turn-key fisheries facilities in Bar'asole, Ti'o and 'Eddi. As an alternative to trucking fish on long bumpy roads, a collector boat, that is equipped with a chilled container, leased by the co-operative society could collect the catch for distribution. This notion may have to be considered as a short-term stopgap measure in light of the long time it takes for the development of roads and other basic infrastructure.

A potentially disturbing incident appears to have taken place in Bar'asole within a week prior to the arrival of the mission: a trawler is alleged to have violated a condition of access by operating in water shallower than 30 m. The Bar'asole fishermen thus had some gear and nets destroyed. Complaints were filed with the MoF. This incident should be investigated and appropriately stiff fines levied with warnings issued that repeat offenders would lose their licence. From past experience elsewhere, the team believes that this incident is likely to be repeated in the future. A group at FAO (Fisheries Industry and Technology, FLIT) is developing

low technology, community based participatory MCS systems. It would be worth exploring this avenue as a means to legally manage or even avoid similar conflicts

- **Distribution and marketing**

The project has contributed much to this area in providing refrigerated trucks that are now leased to private operators by the SFCS. The emphasis has been on providing fish to the urban areas domestically and for export of high quality fish. Whereas a little over 350 mt were distributed in Massawa and Asmara in 1992, this figure has gone up to just below 550 mt in 1995, an increase of over 50% over three years. Over the same period exports were about equal to the domestic consumption figures (MMR Progress Report). Since 1999 the percentage of exports has increased from 50% to about 60% along with another doubling of landing figures.

Though price subsidies have long been discontinued, the point made by previous missions is that pricing policies tended to favour the urban population who are, on the whole, better off than the rural and pastoral population. Another important observation made by this mission is that fish products are not available in the same manner as other alternative products, like meat and poultry. A consumer education campaign undertaken by the Market Studies and Promotion Unit of the MoF was a runaway success; but the mission was informed that consumers do not see fish as widely distributed as other commodities at reasonable prices. A determined customer has to go to the Gejeret Fish Market and may well be disappointed, as the supply of fish products is uneven. Most fish coming into Asmara is supplied to the large easy institutional buyers such as hotels and restaurants. The project attempted a retail distribution scheme by trying refrigerated boxes on bicycles and tricycles. These were returned because the fish sellers had very low margins for much work and the fish were sold "round" without even heading and gutting. This experiment was discontinued and the boxes/tricycles were sold.

The mission was made aware of instances in which when there is a glut of fish in the market, the Market Studies and Promotion Unit is called upon to help sell the fish. Radio announcements are made advising listeners of the location and time of the fish truck and invariably sales are very good. This could be done on a regular basis instead of only when an excess of fish comes on the market. Thus there is room for the fishermen's co-operatives to enter into the breach and fill this potentially lucrative niche where they will have a comparative advantage especially if preliminary processing is done before sale. Rather than only when there is a glut, the co-operatives can provide this service on a regular basis over an increasing geographical area.

After a pilot trial, a cannery in Barka is capable of producing up to 1300 cans of 240 g tuna that sell at Nfa 6 / can. The team was made aware by the Marketing Unit that the cannery is proposing a doubling of the selling price to stay profitable. Given sufficient marketing skill at the disposal of the co-operatives, this cannery can absorb much of the tuna catch that goes unsold.

- **Massawa Fish Drying Operation**

Even as the project was winding down, it supported (Nfa 1.4 M from the GoE and USD 30K from UNDP) a pilot scale activity of fish drying in Massawa that is run by a group of local women. This facility produces dried fishmeal for human consumption (80% of its output) as

well as animal feed. Fish that are not sold on the market are bought by this project and put to good use. In operation for only four months and eight more to go, this activity can be a financial success (though right now it is not) and can provide yet another point of sale for co-operatives. The social value of this pilot project is likely to far out-weigh its profitability, or lack thereof- more likely, as it can (using unsold and second and third rate quality fish) provide much needed protein cheaply to public institutional users.

4.1.2 Capacity Building Project

- The impact of this project has been in two broad areas: at the level of the Ministry of Fisheries, a streamlined organisational structure is now in place as well as some very important operational units such as the MCS, the Research and Training; and the Fisheries Data/ Information System. A legal framework is now in place that informs policies of fisheries development. Programme planning, management and co-ordination capacity to ensure the effectiveness of key Ministry functions remains on the weak side though these are functions that evolve over a long time and should not be regarded as concrete outputs. Specific and targeted training missions, as well as on-the-job training are the type of on-going investment in human capital that pays dividends in the long run.
- Though certain of the Project units and their functions were folded into other GoE structures, their impact appeared to have ceased with these transfers. The Policy and Planning Unit (PPU) was to be charged with planning and co-ordinating donor assisted projects related to fisheries. Some of these, like JICA's infrastructure project in Assab, were directly related to fisheries development while others, like the GEF's National Marine Resources Programme were related indirectly. The functions of this unit have been transferred to the Office of Macro Policy and International Co-operation. Likewise, the project produced an ICZM plan but lack of resources and a trained cadre to carry it out may have necessitated its transfer to the GEF.
- Another area where the Capacity Building Project has had an impact is at the other end of the spectrum in the establishment of training and extension services of Ministry personnel. These in turn have had a direct impact on the fishermen co-operative societies and the administration of the credit scheme. The mission has observed in the fishing communities the positive impact of the credit scheme on the lives of fishermen and their families. Though appreciative of the assistance, in many a meeting the mission heard the desire for more help. Ironically, the needs are not so much in production skills (though many inputs remain in short supply), but at the other end of the chain, in marketing.

4.2 Project relevance and effectiveness

- Though a great deal of progress has been made in the fisheries sector thanks to these two projects much remains to be done. The context and conditions behind launching these two projects, though ameliorated, remain as valid as they were at the start in 1992. Of the two projects the more effective was the Semhar Rehabilitation Project in that it had the larger and deeper impact on the development of the sector. This is partly due to the geographical and operational focus: construction of buildings and procurement of such large items as refrigeration units, ice machines and transport facilities and

setting them up in Massawa and Asmara must have been somewhat easier than doing the same on Dahlak, or in Assab or Ti'o. More difficult to measure and evaluate are outputs that

have to do with the building of human and social capital.

- Recalling the original conditions in the country just after independence, it could not have been too easy to foresee specific causes for cost escalation; there were plenty of causes on hand everywhere. Cost escalations in the Semhar Project were limited to a small fraction of the total project outlays. The delays were primarily due to engineering and underwater construction difficulties; contractors with such skills were not available in Eritrea at the time.
- The following outputs are deemed to have been satisfactorily delivered by the Capacity Building Project:
 - Revised organisational structure for the Ministry of Fisheries
 - Marine resources policy framework, legislation and regulations
 - Identification of long term training and extension needs
 - Management plan for the main commercial fisheries
 - Developed infrastructure and equipment
 - Establishment of ten fishing villages in the Sahel region
 - Increased fish production
 - Increased capability for fish stock assessment, monitoring, and baseline survey
 - Socio-economic studies in the fishing communities
 - Trained staff and upgraded skills in the Ministry
 - Enforcement of various licensing and surveillance schemes
 - Establishment of technical surveillance, enforcement and quality control capabilities in the Ministry of Fisheries.
- Whereas some of the above "deliverables", such as the first three, can be easily verified, others, such as management plans for specific fisheries, or socio-economic profiles of fishing communities are process-oriented outputs, and thus more difficult to measure accurately. More important than the specific management plan or community profile, is the capacity to produce them and interpret them in a meaningful and informed way. Such skills are acquired over many years of rigorous study and practice. In this broader sense the Capacity Building Project may be seen to be somewhat "out of synch" with the realities on the ground, or on the water. Consider for example the MCS unit: It is a reasonably well trained unit consisting of a pool of about sixty observers (two are chosen at random for each trip) that provide as good and unbiased a coverage of the industrial trawlers as any Ministry of Fisheries would want (they record each and every set). Though nearly complete, and as important as it is, their coverage is limited to the industrial trawlers. The much larger problem of having a reasonably accurate picture of the operations of large numbers of Yemeni boats remains unaddressed. In this sense, then the effectiveness of the Capacity Building Project is incomplete.
- One approach to capacity building that could be considered in the future is learning by praxis. A workshop format may be adopted in which participants, say from the fisheries statistics and/or research units are given a series of targeted lectures followed by actual examples taken from their own experience. In effect each participant brings his or her data and analyses them under the supervision of the workshop animator. This approach is more cost effective than sending candidates abroad, important and desirable as that may be in some circumstances.
- Despite the shortcomings of the Capacity Building Project, the outputs delivered are well aligned with the national development objectives as articulated in the PRODOC. A continuation of the

assistance in this area would re-enforce the Ministry's cadre of skilled staff.

5.0 Critical

issues 5.1

Sustainability

- The business plan prepared by the UNV Co-operative and Credit Officer for the SFCS (Moinul Islam, 1995) and a Mid Term Review mission (Diffey and Knudsen, 1996) concluded that key activities were not sustainable and that they will require "*financial subsidy and/or institutional support for the foreseeable future* " [emphasis added]. Because valuable resources have been diverted into the border conflict over the past two years, financial sustainability of some key activities and installations (such as the Massawa Fisheries Centre and the Massawa Boat Yard) has been pushed further into the future. Other installations, for example the refrigeration workshop, REFCO, are more likely to be commercially profitable if divestiture is adopted as a policy.
- The above notwithstanding, there is no doubt about the existence of a strong regional market for fisheries products and that Eritrea's production can meet this demand profitably. The Assab Fisheries Centre can be financially viable if dedicated to export markets around the region.
- The Semhar Project has contributed significantly to the development of coastal and island communities, but the need for further intervention over the next few years has not gone away. The opinion of this mission is that capacity building targeted at the local level, particularly the primary fishermen's co-operatives, will have high returns.
- Likewise, the Capacity Building Project has fulfilled, although to a more modest extent, many of the needs for institutional capacity building in the sector. These gains are more likely to be sustained if more focused technical and managerial skills are delivered to fishermen's co-operatives and to Ministry cadres.
- The Massawa Boat Yard, though not financially viable at this point, can play an important role when twinned with the Joint Venture Company, the Harena Boat Yard on Haleb Island, as a repair and maintenance facility.
- Important as they are, financial viability and sustainability of project activities are not the only dimension. Social sustainability is equally important if not more so. Although exact figures were not available, over 1000 fishermen are members of primary fishermen's co-operative societies in their villages. This figure bodes well in the long run, as these co-operatives become more sophisticated agents in an increasingly complex sector. The increasing numbers (provided by MoF personnel) suggest increasing identification with the co-operatives and a sense of ownership of their direction. With ownership comes a sense of responsibility for future growth and expansion in operations.

- The long time during which Eritrea's fisheries were underexploited, provided a chance for stocks to build up a large "natural capital". The pace of expansion of the sector is increasing as more trawlers apply for access to Eritrea's fish resources. Ecological sustainability may not appear to be a problem now, but easily accessible resources will be the first to be over-fished and depleted. Consider, for example, the fact that Yemeni fishermen prefer to come to fish in Eritrea despite the longer distances and the higher costs. The reason is that profitable concentrations of desirable species in Yemeni waters are no longer as accessible as they used to be. Reef fishes are typically long-lived and have slow growth rates. Over a large geographical area, harvesting rates have to match surplus production and growth rates if depletion of "capital" is to be avoided. It would be misleading to come up with a

27

figures that define upper limits at this point. More important that tonnage is increasing the value of the harvest.

5.2 Project Monitoring and evaluation

- With greater emphasis on implementation of activities, not enough consideration was given at the design stage to monitoring and evaluation. However, project personnel, both expatriate and national, must be credited with an attitude of "flexible response" that allowed them to work out problems as they arose.
- Though formal evaluations were not carried out, these two projects were not completely bereft of some form of periodic evaluation. This took the form of Tripartite Reviews that provided the "adaptive" adjustments. According to Ministry documents, however, these meetings did not take place often enough to substitute for continuous monitoring and evaluation systems.

6.0 Lessons and recommendations

- The economic linkage to and the proximity of Yemen as a market to sell Eritrean fish and buy inputs (as well as a whole range of consumer products) is one of the critical core problems that must be addressed if the fisheries sector is to develop and contribute to the national economy. Most of the fish caught in Eritrean waters are landed in Yemen. Estimates of Yemeni fishermen's catch in Eritrea vary but may be as much or more than is landed and recorded in Massawa; the estimate is anywhere between 4 000 and 21 000 mt. Perhaps as much as two thirds to three quarters of Eritrea's catch is landed in Yemen, mostly - but not exclusively - by Yemeni boats.
- The problem of unregulated access to Eritrea's resources has the following effects:
 - The Eritrean Government is thus deprived of foreign exchange earnings that would otherwise flow into Eritrean society.
 - There is short-term "mining" of fish resources that deprives Eritrean society of value added from processing and export.
 - Without clearly defined and enforceable fishing rights depletion of resources is a likely outcome in the long run (two or three decades?). Conversely, evidence elsewhere¹⁰ suggests that property rights can be applied to manage fisheries sustainably.

- In the short-to-medium-term the following actions should be taken with or without external development assistance:
 - Extend MCS operations to all fishing vessels operating in Eritrea's waters, not only the industrial trawlers. This should be a matter of priority.
 - Continue emphasis on building infrastructure facilities along the Eritrean coast.
 - Focus assistance on the microeconomics at the local level that is where individual fishermen make their decision about where to sell their catch and buy their supplies.
- Resolving the problem in the long term will be a matter of addressing the following issues:
 - Domestic consumption: Despite the success of campaigns to promote fish consumption, domestic consumption patterns of protein are such that the aggregate internal market is rather

¹⁰ See presentations in Shotton, R. (ed.) Use of property rights in fisheries management. Proceedings of the FishRights99 Conference. Fremantle, Western Australia, 11-19 November, 1999. Mini-course lectures and core conference presentations. *FAO Fisheries Technical Paper*. No. 404/1. Rome, FAO. 2000. 342p.

limited. These patterns, however, can change and there are indications that they are changing. Making fish as widely available as other substitute meat products throughout the country - and not just in the urban areas - should be a priority that will boost the level of domestic consumption. The projected increase in domestic consumption does not have to come from species earmarked for export earnings, though these should certainly be available. Eritrean fishermen can land 25 000 mt annually of small pelagics (sardines and anchovies) if a market is found to absorb this catch. (In this connection, it should be mentioned that while the evaluation mission was still in Eritrea the FAO representation in Asmara had received a confirmation that a TCP had been approved. Focusing on the artisanal fisheries sector, this US\$370 000 programme will focus on un-exploited and underexploited fisheries resources particularly small pelagics and high value fisheries resources between Assab and Ti'o.)

- Export networks: Although fish from Eritrea can now be purchased in western European capitals, a more aggressive promotion campaign is yet to be undertaken by exporters. Though large companies have an advantage, in this age of easy communication private investors with the knowledge and the sophisticated understanding of the dynamics of international markets can find a niche in Eritrea's emerging fisheries sector.
- Profit margins: The profit margins for fishermen in Eritrea are generally quite thin. The prices they face domestically for their inputs are too high to be competitive and they are price takers, not price setters, for their product. They face quasi monopsonies that set prices and they have little or no negotiating clout.
- Intra-sectoral conflict: Despite the stated policies to promote the artisanal sector, the undisputable facts are that industrial fisheries have made greater use of the infrastructure so far built in the country. The interests of these two sub-sectors are naturally in conflict. Whereas the smaller low powered pelagic trawlers are less likely to encroach on fishing grounds of artisanal fishermen, this is precisely the expected

outcome when the large industrial high-powered (nominally Saudi Arabian) trawlers are considered. As noted elsewhere, this mission was made aware of such a transgression by trawlers to depths shallower than allowed by the conditions of access that caused gear destruction in Bar'asole.

- Productivity of artisanal fishermen: The productivity of artisanal fishermen has increased dramatically since the Semhar Project started but, unfortunately, remains low. This is due to an ageing fleet and a work force that has yet to attract the younger more energetic segments of the communities. The artisanal fleet still uses inefficient gear that is not selective; the same nets are used for everything whether they are suitable or not. A more specialized gear that selectively targets seasonal abundance of species is yet to be introduced and accepted (consider, for example, pots to harvest lobster instead of the currently used general purpose and non-selective tangle nets). Boats in fishing communities are not used strictly for fishing. They are assets that are put to other uses as well, such as trading and transport.
- The preceding discussion may also be regarded an argument to target future assistance on fishermen's cooperative societies, both the primary societies in the coastal communities as well as the secondary co-operative societies that can now engage in a range of activities that goes beyond the communities they serve.
- Another lesson that can be extracted from this evaluation is related to a "systems" view of the two projects. The idea here is to show where the two projects fit and, hopefully, where future assistance may be targeted. The following is schematic diagram of a fishery presented in such a view. The four boxes are the basic system components and the arrows between them denote the identity and the direction of the exchange. Besides identifying the component, each compartment points to the discipline or factors that help our understanding of the whole system. This systems view may be helpful in informing and targeting future assistance where it is needed, especially if done within a context of a logical framework.

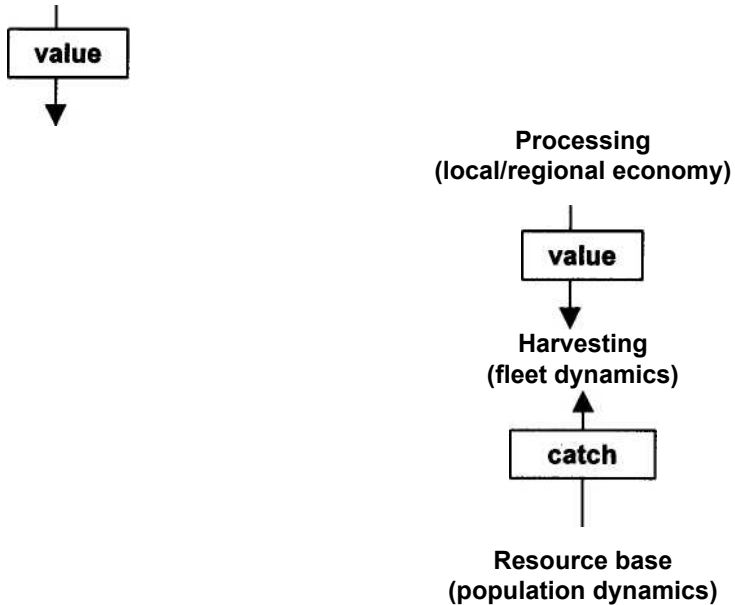
29

Ex post Evaluation of ERU92/001(UNDP) ERI/921C01(UNCDF) and ERI/94/001(UNDP)
June 2001

Marketing
(local/global market dynamics)

T
product

catch



- The resource base is the stock upon whose continued productivity the whole sector depends. Our understanding of this productivity is aided by a variety of models appropriate for the particular fishery. This is the realm of fisheries science that uses quantitative methods for stock assessment and whose ultimate objective is to understand and quantify the effect of fishing on the fish stocks. Competence in this area can only be accomplished with long-term commitments to produce a postgraduate level of practitioners that are well grounded in the requisite quantitative disciplines. The pool of available cadres in the Ministry of Fisheries, though all university graduates, tends to be from backgrounds that are generally weaker in quantitative analytical skills. Though the Capacity Building Project has supported training and upgrading of skills through short-term study missions to appropriate institutions abroad, the contribution of development assistance projects is limited. While data collection and management structures may be in place, the analytical skills to interpret and communicate harvesting implications come only with advanced training and practice in the craft. Though the short-term objectives set for this area have been accomplished, the long-term development objectives will only be accomplished when a trained cadre of fisheries scientists and economists is informing the Ministry's policies and decisions.
- The next system component is the harvesting sector, the combination of boats, gear, and fishermen that collectively extract the catch and pass it along to the next component, the processing sector, in exchange of money. Fishing fleets have their own dynamics that govern the

level of investment in boats and gear based on the cost of gear and maintenance and expected revenue. This is where government and donor intervention have started the sector going with the launching of the Semahr and Assab infrastructure rehabilitation. With the

exception of the Dahlak Islands infrastructure, all the immediate objectives related to this component have been accomplished, though the functions of the Project Implementation Unit have been transferred out. In the circumstances immediately after independence it could not have been easily possible to get a clear picture of the fleet dynamics. It was all too clear that investment in infrastructure was needed immediately and should be undertaken forthwith.

- The Semhar Rehabilitation Project has provided assistance to the next two components, processing and marketing, more or less as one component without distinguishing between them. As noted earlier, the extent of the economic and trading links between the coastal communities of Eritrea and Yemen were not researched and understood well enough at the time. Assistance in the future should be based on a more accurate and detailed knowledge of how the sector is embedded in the regional economy, and how it could be part of the international trade in fisheries products.
- If future assistance is to be informed and inspired by UNCDF's document "Taking Risks", then the Co-operative societies in Eritrea offer the perfect target for community-based, participatory development in the fisheries sector. This statement does not diminish the need in the fishing communities for basic infrastructure like roads, access to water, sanitation, health, education and the rest, but is simply meant to emphasise that fisheries resources in Eritrea offer an ideal venue for development *at the periphery*.
- Now that the legal status of Co-operatives has been clarified, they can engage in a variety of activities that can make a difference in the lives of communities. Assistance to co-operatives, especially with respect to how they could operate profitably, would be consistent with the UNCDF's new vision. There are many ancillary business activities, like provisioning of consumer items and related ventures (e.g. eco-tourism, live ornamental fish collecting for sale to the international marine aquarium trade, specialised delicacy type processing) that could be undertaken by the co-operatives themselves rather than merely providing fishing labour.
- Assistance at the state level could be directed towards long-term sustainability rather than focusing exclusively on expanding existing infrastructure, important as that may still be.
- The management of fisheries in Eritrea is based on a model of public ownership and government regulation to ensure that rules of access are enacted and enforced in a manner consistent with long-term sustainability of the productive resource base. Whereas this is applied with a fair degree of rigour to the industrial trawlers, the catch of the large number of Yemeni boats operating in Eritrean waters (currently estimated to be anywhere between 4000 and 21 000 mt) goes unreported. The mission did not have the time and the resources to investigate the magnitude of this unregulated fishing. The long-term implications of this unregulated fishing for sustainability are likely resource depletion and a shift towards less desirable species composition and/or size distribution". Evidence in other parts of the world suggests caution.
- One way to practice caution is to explicitly adopt and vigorously enforce FAO's Code of Conduct for Responsible Fishing.

" In an informal discussion a year earlier between the author and Yemeni fishermen in

Hudeida revealed the following comparison: the average boat could catch in five days when fishing in Eritrean waters what it would normally catch in two weeks of fishing in Yemeni waters.

- There are two classes of trawlers currently operating in Eritrea now under short-term licence agreements. The first are the low powered and smaller pelagic trawlers (Mediterranean type) primarily operated by Egyptian companies that focus on species that live on sandy bottoms. These trawlers, as a general rule, do not cause much damage to the bottom environment. The other type is the fleet of large high-powered industrial trawlers that are nominally operated by Saudi Arabian companies. These trawlers can be particularly destructive to the benthic environments especially when they operate in shallower environments than allowed. The mission was made aware of one incident where one such trawler operated at a depth shallower than the licence allowed.
- As profitable concentrations of the desirable species are depleted incidents of the kind reported are likely to increase; this is suggested by experience elsewhere in the world. This, in turn is likely to lead to increased inter-sectoral conflict between the industrial and artisanal sectors. Theory as well as experience elsewhere in similar environments the world suggests that rivalrous behaviour among fishermen will increase at the expense of long-term sustainability.
- Without being unduly alarmist, the mission wishes to point out that fisheries management in Eritrea can benefit from mistakes made elsewhere. As a condition of an operating licence, foreign trawlers could be asked to submit to a Vessel Monitoring System (VMS) that can be implemented in several different ways.
- Another approach to avoid the twin problems of biological over-exploitation and economic overcapitalisation in the fisheries sector is to adopt a regime of management that is based on property rights. This can take any number of forms that ranging from territorial use rights, the so-called TURF (territorial use rights in fisheries) on to Vessel Quotas and, in the case of very high value fisheries, ITQ's or Individual Transferable Quotas.
- The following two tables present, respectively a summary of the critical issues, major findings, recommendations, means and actors; and a summary of a SWOT analysis of three important actors in the fisheries sector in Eritrea, namely, the co-operatives, the Ministry of Fisheries and the private companies.

critical Issue	finding	recommendations	means	actors
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regulated access to sea's fishing grounds	• over 20 000 mt harvested in Eritrea are estimated to have been landed in Yemen; more than ten fold the landings in Eritrea • substantial revenues lost to Eritrea • input costs in Eritrea not competitive with Yemen's	• in the short term: increase technical and computing skills to track large numbers of fishing vessels. • in the long term: develop and adopt a strategy of a licensing system • re-focus development at the "periphery", i.e. village level	• increased statistical coverage and skills to process, interpret and display information spatially (workshops) • regional co-operation with countries involved • improvements to village level infrastructure and capacity	• research and training unit • MCS unit • FAO as source of specialised technical expertise (FIRM) • extension and co-operatives division
sectoral conflicts	• large industrial trawlers operating at depths shallower than authorised	• vigorous enforcement and prosecution • VMS • policies favouring the artisanal fleet over the industrial trawlers	• imposition of heavy fines • threat of loss of licence • increased technical assistance at the village co-operative level and at the apex level	• MCS unit • Navy • legal system • FAO (FIIT) • extension and co-operatives division
marketing and distribution	• uneven and inadequate supply of fish to urban areas • occasional glut resulting in lower prices and poor quality • regional market not served by Eritrea's fish products	• increase means and venues of sale of fish in the domestic market • wider geographic coverage throughout the country • focus on value added processing instead of export of frozen fish to large regional customers	• product diversification through some processing for the domestic market • refrigerated trucks with ice trays of headed and gutted fish or fillets • state of the art processing and cold chain to regional markets such as large cities in the Gulf	• co-operatives • marketing unit • fish marketing/business consultant
Harena boat yard	• currently not sustainable without an open-ended subsidy	• role change from wooden boat building to a satellite maintenance and repair yard under the Harena boat yard	• gradually over 3-5 years under the supervision of the current joint venture with the Australian private company	• Ministry of Fisheries • Harena Boat Yard joint venture on Haleb Island
expansion vs sustainability	• though there's considerable room for expansion of fishing effort, current regime of quasi regulated open access not sustainable in the long run	• start the process of adopting a management regime that is based on property rights	• start a registry of fishermen, boats and gear in each fishing community • define and endorse TURF's starting with valuable fisheries like lobster and shrimp • start a process of participatory MCS	• primary and secondary co-operatives • research and training unit (computing facility) • MCS • FAO (FIRM) • FAO (FIIT)

Ex post Evaluation of ERU921001(UNDP) ER11921C01 (UNCDF) and ER1194/001 (UNDP)

June 2001				
Organisation	Strengths	Weaknesses	Opportunities	Threats

eratives	- established legal status that permits engagement in a variety of commercial activities such as processing, marketing locally and regionally - local knowledge about fisheries resources such as distribution, abundance, seasonality, regional demand etc. - relatively low opportunity cost of labour compared to other sectors - traditional social structure makes co-ops potentially successful recipients of community based fishing rights, such as TURFs	- both the leadership and membership of co-ops are not yet sophisticated professional players in regional and global markets - operate with a thin margin of profits as inputs have to be imported - restricted access to credit and finance: informal lending ties of members to money lenders - low productivity compared to more modern fishing operations - low general and financial management capacity	- targeted capacity building would pay dividends in the medium and long term - processing, marketing and distribution of by-catch on the domestic market - co-ops can now enter into contracts to purchase inputs directly with their own hard currency avoiding delays - local co-ops can now provide alternative livelihoods in villages such as harvesting ornamental fish for the international aquarium trade - repair and maintenance of boats and gear can now be undertaken by co-ops	- intra-sectoral conflicts with industrial trawlers who violate terms of their license by fishing at depths shallower than permissible - competition with the unregulated access to fish grounds by Yemeni fishermen - dependence on Yemen as a single large market for fish caught in Eritrea's waters - loss of trainees to other more lucrative sectors of the economy - vagaries of commodity prices fishermen being generally price takers not price setters
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Ex post Evaluation of ERU92/001(UNDP) ERI/921C01 (UNCDF) and ER11941001(UNDP)

June 2001

of Fisheries	- dedicated and motivated staff - a relatively small size of staff - a track record of "flexible response" - support from highest levels of government as well as from regional governments	- uneven level of training - data analysis and interpretation, projections using various alternative management scenarios - regular cost/earnings survey and other economic data collection and analysis - level of knowledge of fisheries science is not highly advanced - access to means of communication within as well as outside the country	- the management of fisheries that have been very lightly exploited over several decades - the gradual decentralisation of management on a sub regional or ecosystem basis - community-based property rights as a basis for rationalisation of fisheries management *regional co-operation in the management of fish resources and their monitoring *capacity building of a cadre of practitioners of fisheries science with in co-operation with private sector	- getting overwhelmed by the magnitude of the geographical realities of the sector - pockets of over-exploitation in some areas may go undetected - the pace of exploitation may be faster than the ability of the staff to adapt and control the sector over the next decade
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the sector companies	~ well managed and profitable ~ emphasis on large domestic accounts (hotels and restaurants) means certainty ~ currently enjoy a relative oligopoly and dictate prices to fishermen ~ relatively easy access to foreign exchange to purchase machinery and spare parts ~ labour costs relatively low ~ access to information on the regional and world market	• lack of Eritrean executives with the requisite training (e.g. M.B.A.) and experience in the international fish trade who can fully and completely replace foreign nationals in these private firms	• more value-added processing before export • increased employment in the sector • diversification of raw material input (use more of available species e.g. tunas) • product diversification • transfer of management to Eritrean executives sponsored by Technical Assistance projects including vi to countries where novel methods of fisheries management are developed and practiced (e.g. Australia)	• large up-front investment facilities with uncertainty in supplies of raw material • competition with traditional regional markets (e.g. Yemen) for the catch
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36

Ex post Evaluation of ERI/92/001(UNDP) ERI/92/CO1 (UNCDF) and ERI/94/001(UNDP) **June 2001**

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37

Ex post Evaluation of ERI/92/001(UNDP) ERI/92/CO1 (UNCDF) and ERI/94/001 (UNDP)
June 2001

8.0 List of persons met

Date **Person met** 23/1/2001 Dr. Wolday Futur

24/1/2001 Mr. Haile Awalom 24/1/2001 Mr. Yosief Kahsay

24/1/2001 Mr. Anwar Saleh 24/1/2001 Mr. Ghirmay Woldegiorgis 25/1/2001 Mr. Mohamed Saleh Said
Semer

25/1/2001 Mr. Hamid Osman 26/1/2001 Mr. Abraham Kebedom 26/1/2001 Mr. Tesfaalem Bein 26/1/2001
Mr. Bill Brown

26/1/2001 Mr. Yemane Binegaw 26/1/2001 Mr. Tamrat Negash

28/1/2001 Mr. Efrem Kiflu 28/1/2001 Ms. Almaz Maemun

28/1/2001 Mr. Mohamed Ali 28/1/2001 Mr. Abraham Teclemariam

29/1/2001 Mr. Tesfay Tecle 29/1/2001 Mr. Rasheed Yosuf

29/1/2001 Mr. Mussa Idris Omar

Mr. Yosuf Mohammad Ali Mr. Ahmed Mohammad Mr. Idris Mohamed Fadel

30/1/2001 Mr. Kibrom Shumdehan Mr. Terrence Dovey 1/2/2001 Mr. Mehari Gilagaber

1/2/2001 Mr. Woldeab Fessehaye

2/2/2001 Mr. Dawit Fessehaye

6/2/2001 Ms. Lia Tesfai

6/2/2001 Ms. Rediet Tsehaye

Organisation

Macro Policy and International Cooperation, Office of the President Ministry of Fisheries

Ministry of Fisheries Ministry of Fisheries LEDA Company

Dahlak Fishermen Cooperatives Ministry Fisheries, Dahlak Ministry of Fisheries, Boat Yard

Ministry of Fisheries, Boat Yard Ministry of Fisheries, Boat Yard Ministry of Fisheries, REFCO

Ministry of Fisheries, Fisheries Resources Development Ministry of Fisheries

Ministry of Fisheries, Cooperative Unit

Ministry of Fisheries, Extension Unit

Ministry of Fisheries, Assab Branch, Cooperative Unit Ministry of Fisheries - Bar'asole Ministry of

Fisheries- Assab Bara'sole, Extension office

Bara'sole Fishermen's Co-operative "

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Harena Boat Yard

11

Ministry of Fisheries, GEF Project Ministry of Fisheries, Fish Drying Unit

Ministry of Fisheries, Industrial Fisheries development Division Ministry of Fisheries, Market Studies and
Promotion Unit Ministry of Fisheries, Market Studies and Promotion Unit

Position

Location

HeadAsmara

D.G. Fisheries	Massawa Development
Director, Extension	Massawa and Cooperatives Division
Staff	Massawa
Representative	Massawa
Master Fisherman	Dahlak
Fisherman	Bar'asole
Fisherman	Bar'asole
Fisherman	Bar' asole
Fisherman	Bar' asole
Deputy manager	Haleb Island
Manager	Haleb Island National Coordinator Massawa
Manager	Massawa

Division Head Assab

Unit Head Asmara

Staff Asmara

Branch Head

Boat Builder Mechanic

Marine engineer, Training Specialist Manager Staff

Dahlak Massawa Massawa Massawa

Massawa Massawa

Branch Head Unit Head

Assab Massawa

Unit Head Unit Head

Extension Agent Extension Officer

Massawa Assab

Bar'asole Assab

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Country:

Eritrea

Sector:

Fisheries

Semhar Fisheries Rehabilitation Project

Project No. ERI/92/001 (UNDP)

Project No. ERI/92/CO1 (UNCDF) Capacity Building for the
National Marine Resources Programme Project No. ERI/94/001 (UNDP)

Executing agency: Ministry of
Fisheries UN **Co-operating**
agency: FAO

Project financing:

	Semhar Rehabilitation	Capacity Building	Total
UNDP	USD 3247 554	USD 828 800	USD 4 076 354 (47%)
UNCDF	USD 4030 475	NA	USD 4 030 475 (47%)
GoE	(in kind) USD 526 500	NA	USD 526 500 (6%)
Total	USD 7804 529	USD 828 800	USD 8 633 329 (100%)

Project Chronology:

	Semhar Rehabilitation		Capacity Building
Project No.	UNDP	ERI/92/001	ER 194/001
	UNCDF	ERI/92/C01	
Approval Date	UNDP	1992	1994
	UNCDF	1992	
Start Date	UNDP	1992	1996
	UNCDF	1992	
Completion Date	UNDP	1999	1998
	UNCDF	2000	
Midterm Evaluation	UNDP/CDF	May 1996	Not undertaken
Ex post Evaluation	UNDP/CDF	January/February 2001	

b. Project Background:

In the 1950's Eritrea had an estimated output of 25 000 mt of fish engaging a large number of fishermen in the sector. Much of the production was of the sardine and anchovy fisheries along the

southern part of the coastline between Assab and Ti'o and was destined for industrial feed production in Italy as well as for human consumption. The closure of the Suez Canal in 1967 and the following political instability brought the fisheries sector to a halt.

The UNDP, UNCDF and FAO had been providing technical assistance in Assab under the Ethiopian political regime since 1986. Another project funded by Italian Aid focused on Massawa and Dahlak at about this time. The UNDP/UNCDF/FAO project continued in Assab until 1991 when the city was captured by the EPLF. Soon after liberation the relevant/competent authority for fisheries in the PGE was DMRIF. The PGE through the DMRIF requested a joint UNDP/CDF/FAO to shift the geographical focus of rehabilitation of the sector from Assab to the Massawa/Dahlak axis. The project document was reformulated by Complementary Project Preparation Mission (CPPM) in June 1992 and submitted to UNDP/UNCDF Joint action Committee. It was submitted to Provisional Government of Eritrea (PGE) in August 1992 for endorsement.

By the end of 1992 the new project, titled "Semhar Fisheries Rehabilitation" was approved by the UNDP and the UNCDF with the designations ERI/92/001 and ERI/92/COI respectively. At about the same time, and under a TCP project, FAO carried out a comprehensive review of the fisheries sector in Eritrea, formulated a new legal framework and drew up a strategy for an overarching National Marine Resources Programme.

Before the Semhar Project got underway, In April 1993, and pursuant to the request by PGE, the suspended UNDP/UNCDF/FAO projects in Assab, ETH/82/ 106 "Rehabilitation of the Red Sea Fisheries", and ETH/83/C01 "Marine Fish Marketing Development" were reactivated and the funds remaining to their respective credit were placed under the managerial umbrella of ERI/92/001. The project numbers were also changed to ERI/82/016 and ERU83/COI respectively. Furthermore, in August 1993, the UNDP component ERU82/016 was incorporated into ERI/92/001, while the UNCDF component ERI/83/COI was changed to ERI/92/COI in June 1994.

Hence, until 1994, UNDP and UNCDF assistance focused mainly on building infrastructure and fishing community development activities. In 1995 the second project, Capacity Building for the National Marine Resources Programme, ERI/94/00 1, was started with the assistance of UNDP to complement the development efforts and strengthen Ministry of Fisheries and Marine Resource's capacity to utilize and build upon the infrastructure activities.

So, starting from almost totally de-capitalised sector after independence, the PGE looked naturally towards revitalising the once productive fisheries sector as a means of bringing back into the mainstream those areas that had long been economically dissociated from the rest of the country.

c. Project description:

- **Semhar Rehabilitation:**

The project was intended to fulfil the following **long-term development objectives**:

1. Improve the incomes and quality of life of the fishing communities, for whom fishing is the sole economic activity;
2. Increase the supply of fish, a valuable source of protein, at least to the urban areas, where the nutritional status in general is below desirable standards;

3. Generate foreign exchange by promoting export of those fish or marine products for which no domestic market exists;
4. Support and strengthen national fisheries institutions in the public and private sectors to promote self-sufficiency in national fisheries management.

The **immediate objectives** of the Semhar Project are:

1. Rehabilitation of the fleet to support fish production by ensuring an adequate supply of scarce fishery inputs.
2. Improvement of Fish landing and Distribution by providing a range of services to the Massawa / Dahlak artisanal fishing industry.
3. Improvement of Social Infrastructure to improve standards of living in the fishing villages (on the Dahlak Islands).
4. Strengthening of the Fisheries Department (now the Ministry of Fisheries) by establishing a Project Implementation Unit (PIU) within the Department.

The **outputs** in the Semhar Project are the following:

1. Rehabilitated fishing fleet: At project completion the total number of vessels in the Dahlak / Massawa gillnet and handline fisheries' would have increased from 70 to about 85.
2. Increased employment: The number of active vessel owners increase through the project from about 70 to about 85, while the number of crewmen employed would rise from about 350 to almost 500. About 40 new jobs would also be created in the fish distribution and retail trade.
3. Increased Income: Mean annual crewmen's income would rise as a result of the project from an estimated \$1,400 to \$2,200 (in local currency).
4. Strengthened Fishermen's association: By the end of the project period, the association would be expected to have evolved into fully independent entities, capable of managing their own finances and of making their own investment decisions in the future.
5. Improved availability of fish on the domestic market: The supply of fresh reef and large pelagic fish to domestic markets in Massawa and Asmara would be expected to increase from about 600 tonnes a. to about 1,100 tonnes.
6. Increase export earnings: The value of fish products (mostly dried shark and shark fins) to be exported is expected to exceed US\$ 1.3 M p.a.

Capacity Building

The **long-term development objectives** of the Capacity Building Project are to:

1. Develop programme planning, managerial, monitoring and coordinating capacity and to ensure the effectiveness of key Ministry functions.
2. Develop fisheries research and coastal environment assessment and monitoring capacity to ensure long-term sustainability in the exploitation and conservation of the resource base;
3. Strengthen marine resources related institutions in their capabilities of promoting, coordinating and monitoring an expanded but carefully planned and managed sustained development of the marine resources sector;
4. Develop training and extension services through on-the-job training, formal classroom skill development and the development of government extension workers to assist fishermen to improve the technical and economic effectiveness of their work;
5. Develop a core of effective and control capacity for ensuring compliance with fisheries and environmental regulations.

The **immediate objectives** of the Capacity Building Project were the following:

1. Re-structuring of the Ministry planning and coordination functions to make it fully operational.

41

2. Establishment of a statistics and information network, including databases, documentation facilities.
3. Designing management policy frameworks and strategies for small-scale and industrial fisheries, including licensing and other access arrangements.

The **outputs** of the capacity Building Project were the following:

1. A streamlined/re-organized Ministry of Fisheries (previously known as Ministry of Marine Resources).
2. Fully trained personnel to undertake such activities as project planning and design, sector long term planning, co-ordination or externally funded activities, co-ordination with other ministries, statistics, monitoring and evaluation, environmental research and assessment and administration.
3. Fully trained personnel to run branch offices involving programme and project management, technical assistance to fisher folk, new project development and administration
4. Establishment and operation of a Credit Scheme, which is one of the main functions of the cooperatives.

d Mission purpose:

The present exercise aims at evaluating the above projects jointly. More specifically, the mission is charged:

1. to assess the overall progress made in attaining the immediate objectives and the likelihood of attaining the GoE's development objectives;
2. to assess the relevance of the projects to the goals set by the GoE for the fisheries sector;
3. to assess the sustainability of implemented activities and/or identify exit strategies;
4. to assess the monitoring and evaluation system including review and comparison of key performance indicators and strategic results framework; and,
5. to draw critical lessons learned about project design, implementation and management.

e. Mission findings:

- These two projects have had a profoundly positive impact on the development of the fisheries sector in Eritrea from their inception to their completion. The effects of this impact can be seen on a local community micro scale, on through a regional meso scale and the national macro scale. Landings have increased from about 300 mt in 1993 to 1400 mt in 2000. The contribution of the fisheries sector to Eritrea's GDP went from practically nil to about 10% of the agricultural contribution, the latter being 16% in 1999. Starting from almost a totally destroyed infrastructure, an important economic sector now provides employment to about 3000 workers and their families in many coastal communities. As well, the quality of fish landed has improved to a point now that exports and royalties are providing the Eritrean Government with much needed foreign earnings. Though the main outputs, increased output, employment and foreign earnings have been achieved, there

remains much room for improvement, especially in infrastructure improvements in fishing villages.

- The Semhar Project allowed the construction and rehabilitation of much needed infrastructure, in particular, landing facilities, slipways, cold stores ice plants, machinery and spare parts, building space for office and retail stores. Project funds were used to buy refrigerated trucks as well as boats, engines, nets and other gear for fishermen. A boatyard in Massawa with workshops for refurbishment of existing and salvageable boats as well as repair and maintenance for newer ones was also set up.

42

Ex post Evaluation of ERU92/001(UNDP) ERI/92/C01(UNCDF) and ERI/94/001(UNDP) ***June 2001***

- Most of the outputs outlined in the projects have been met, though there were delays that made such accomplishments uneven.

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- The domestic market, though growing, is still small enough that fishermen's traditional trading patterns with Yemen continue to divert post-harvest activity away from Eritrea. Annual consumption per capita is less than 1 kg/person whereas in Yemen the figure is an order of magnitude higher.
- The dependence on the market in Yemen makes fishermen as well as the progress in the sector vulnerable. During the Hanish Islands conflict with Yemen there was glut of fish in Eritrea but ex-vessel prices were so depressed that fishermen were unable to meet their payments to the revolving fund.
- Though the co-operatives have recently been proclaimed legal entities that can engage in the full range of fisheries activities as opposed to just harvesting, they are still to be accepted as an expression of fishermen's collective purchasing bargaining clout. This is but one of the institutional issues facing the fisheries sector.
- Financial sustainability appears to be uneven between various activities of the project. The refrigeration company, REFCO, is a good example of a candidate to be divested as it is in a good position to be profitable and self-sustaining. At the moment REFCO enjoys a near monopoly on supplying refrigeration repair and maintenance services throughout the sector.
- The Massawa Boat Yard, in contrast to REFCO, is not a good candidate for divestiture. It suffers from a lack of skilled labour and managerial skills; costing procedures, for example, are not used to allocate labour to specific jobs. The machinery is mostly past its useful life and the general appearance of the yard is that of a run-down facility.
- Though not financially viable at present, the Massawa Boat Yard can play an important role if twinned with the joint venture Harena Boat Yard as a repair and maintenance facility.

- The revolving fund that was set up with a line of credit to help fishermen purchase their inputs has to be re-enforced with a new infusion of capital as well as a more rigorous managerial assistance, perhaps in the form of a TA project. Care must be taken here to ensure that the current state of low repayment brought about by the national emergency due to the border conflict does not foster a mindset of open-ended dependence. A more focused TA project targeting cooperatives may answer this need.
- At the same time, however, fishermen providing premium grade fish for export should not be operating on thin margins in the face of monopsonist pricing. If the co-operatives develop their marketing networks, at least within the country, then their acquired skills can be used to expand sales directly to the regional market, and not through fishing companies.

Assessment of project design:

- Neither project benefited from the application of the LFA at the design stage of their development. As a direct result of this, and perhaps also as a result of the urgency of the situation right after the independence of Eritrea, there was some confusion between outputs and objectives

43

articulated in the projects. In fairness though, the application of LFA was not as widely spread as it is now a decade later.

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- Perhaps somewhat optimistically, the project overestimated the potential size of the domestic market given the nutritional deficit in the country at the time. The optimistic assumption was that readily available fish would meet nutritional needs of a large portion of the population. Focusing on the high quality export market earlier may have gone further towards generating foreign income than was actually the case.
- One of the design assumptions of the project had to do with the use of existing boat designs and local expertise and labour to rehabilitate old boats and build new ones, hence the boat yards. This assumption may not have been well researched as the tradition of boat building in Eritrea was never really all that well established, compared to Yemen. Many of those who engaged in boat building and repair had left and, when back in Eritrea had different working arrangements with boat owners. As well, all inputs, no matter of what material the boats were to be built of, had to be imported at considerable cost. Procurement of lumber from the region was not workable and the shipment that ultimately was used did not stand up too well to local conditions.
- Of course no degree of design rigour could have foreseen the border conflict that had a negative effect on the country as a whole. For the fisheries sector, many able-bodied young men and women in the Ministry of Fisheries as well as in fishing communities were drafted in the National Service taking away important expertise as well labour for most of the past two years. Despite this conflict the level of accomplishments has been surprisingly high.

Policy implications and lessons learned:

- More effort could be spent at the design stage to clearly define and articulate objectives and outcomes through the Logical Framework Approach. This is not to advocate a rote application of the methodology, but by a genuine engagement of the representatives from stakeholders.
- Along with the rigorous design criteria and methodologies, project monitoring and evaluation have to be made part of the package. This can take one of several forms all leading to and serving a process of adaptive management of the project. Key performance indicators (KPI's) have to be identified for each of the expected outputs and means for their verification. Ideally these evaluations are done by external auditing services.
- Another project design tool that was overlooked is the Strategic Results Framework (SRF). If used at the design stage, especially in combination with the LFA, the outcome of the Capacity Building Project is likely to have been more in line with the expectations of the Ministry of Fisheries as well as the UNDP.
- The experience gained from the setbacks of the Capacity Building Project should be used to avoid similar mistakes. There appeared to be a disparity between the expectations of the Ministry of Fisheries as the implementing agency and the CTA and his interpretation of his TOR. Channels of clear communication have to be established and maintained early in the process of project design. The mission is of the opinion that the level of technical expertise on the part of assigned staff may not have been closely assessed. One alternative way to build capacity through a TA project is to adopt a workshop format that is prepared in advance and repeated at various times and locations. This can be as complex and advanced as any offering anywhere, complete with analyses of real world data and applications.

44

Ex post Evaluation of ERI/921001(UNDP) ER11921C01(UNCDF) and ERI/94/001(UNDP) June 2001

- Another strategy currently developed and applied by FAO's Fisheries Industry and Technology (FLIT) is a course in distance learning that is tailored for fisheries officers stationed in field stations along the coastline and away from the centre. This self-paced distance-learning course offers them a chance to build their expertise in a variety to disciplines and practical skills of use in their immediate environment. The current limitation of this strategy is communication infrastructure including telephone lines and reliable Internet access, though these are expected to be more widespread in Eritrea over the next few years. The course could also be structured to avoid the Internet altogether, albeit it would be less efficient.
- One of the mission's observations is that despite the stated policy and efforts to encourage the artisanal sector to carry forward the process of development in the fisheries sector, there is the appearance of a shift towards favouring the industrial component. More of the catch that goes through the Massawa Fisheries Centre is caught by industrial trawlers than by artisanal fishermen.

h. Recommendations:

- If future assistance is to be informed and inspired by UNCDF's document "Taking Risks", then the Co-operative societies in Eritrea offer the perfect target for community-based development in the fisheries sector. This is not diminish the need for basic infrastructure

like roads, access to water, sanitation, health, education and all the rest, but simply to emphasise that fisheries resources in Eritrea offer an ideal venue for development "at the periphery".

- Now that the legal status of Co-operatives has been clarified, they can engage in a variety of activities that can make a difference in the lives of communities. Assistance to co-operatives especially in how they could operate profitably would be consistent with the UNCDF's new vision. There are many ancillary business activities, like provisioning of consumer items and related ventures (two examples come to mind: eco-tourism and live ornamental fish collecting for sale to the international marine aquarium trade - this latter activity will have to be done under strict guidelines) that could be undertaken by the co-operatives themselves rather than merely providing fishing labour.
- Assistance at the state level could be re-directed towards long-term sustainability rather than expanding existing infrastructure, important as that may still be.
- The management of fisheries in Eritrea is based on a model of public ownership and government regulation to ensure that rules of access are enacted and enforced in a manner consistent with long-term sustainability of the productive resource base. Whereas this is applied with a fair degree of rigour to the industrial trawlers, the catch of the large number of Yemeni boat operating in Eritrean waters (currently estimated to be anywhere between 4000 and 21000 mt) is goes unreported. The long-term implications of this for sustainability are likely resource depletion and a shift towards less desirable species composition and/or size distribution. Evidence in other parts of the world suggests caution.
- One way to practice caution is to explicitly adopt and vigorously enforce FAO's Code of Conduct for Responsible Fishing
- There are two classes of trawlers currently operating in Eritrea now under short term licence agreements: the low powered and smaller pelagic trawlers (Mediterranean type) operated by Egyptian companies that focus on species that live on sandy bottoms. These trawlers, as a

general rule, do not cause much damage to the bottom environment. The other type is the fleet of large high-powered industrial trawlers that are nominally operated by Saudi Arabian companies. These large trawlers can be quite destructive of the physical benthic habitat, especially when operated in reef areas. The mission was made aware of one incident where one such trawler operated at a depth shallower than allowed.

- As profitable concentrations of the desirable species are depleted incidents of the kind reported are likely to increase; this is suggested by experience elsewhere in the world. This will lead to increased intra-sectoral conflict between the industrial and artisanal sectors. Theory as well as experience elsewhere in similar environments the world suggests that rivalrous behaviour among fishermen will increase at the expense of long-term sustainability.
- Without being unduly alarmist, the mission wishes to point out that fisheries management in

Eritrea can benefit from mistakes made elsewhere. As a condition of an operating licence, foreign trawlers may be asked to submit to a Vessel Monitoring System (VMS) that can be implemented in several different ways.

- Another approach to avoid the twin problems of biological over-exploitation and economic overcapitalisation in the fisheries sector is to adopt a regime of management that is based on property rights. This can take any number of forms that ranging from territorial use rights, the so-called TURF (territorial use rights in fisheries) on to Vessel Quotas and, in the case of very high value fisheries, ITQ's or Individual Transferable Quotas.
- The following table summarises the view of the evaluation mission of the critical issues in the fisheries sector in Eritrea, the findings, the recommendations and the means to ameliorate them as well as the most important institutional actors.

Ex post Evaluation of ERU92/001(UNDP) ERI/92/CO1(UNCDF) and ERI/95/001(UNDP)
June 2001

critical Issue	finding	recommendations	means	actors
regulated access to sea's fishing grounds	• over 20 000 mt harvested in Eritrea are estimated to have been landed in Yemen; more than ten fold the landings in Eritrea • substantial revenues lost to Eritrea • input costs in Eritrea not competitive with Yemen's	• in the short term: increase technical and computing skills to track large numbers of fishing vessels. • in the long term: develop and adopt a strategy of a licensing system • re-focus development at the "periphery", i.e. village level	• increased statistical coverage and skills to process, interpret and display information spatially (workshops) • regional co-operation with countries involved • improvements to village level infrastructure and capacity	• research and training u • MCS unit • FAO as source of specialised technical expertise (FIRM) • extension and co operatives division
sectoral conflicts	• large industrial trawlers operating at depths shallower than authorised	• vigorous enforcement and prosecution • VMS • policies favouring the artisanal fleet over the industrial trawlers	• imposition of heavy fines • threat of loss of licence • increased technical assistance at the village co-operative level and at the apex level	• MCS unit • Navy • legal system • FAO (FIIT) • extension and co operatives division
marketing and distribution	• uneven and inadequate supply of fish to urban areas • occasional glut resulting in lower prices and poor quality • regional market not served by Eritrea's fish products	• increase means and venues of sale of fish in the domestic market • wider geographic coverage throughout the country • focus on value added processing instead of export of frozen fish to large regional customers	• product diversification through some processing for the domestic market • refrigerated trucks with ice trays of headed and gutted fish or fillets • state of the art processing and cold chain to regional markets such as large cities in the Gulf	• co-operatives • marketing unit • fish marketing/business consultant
Harena boat yard	• currently not sustainable without an open-ended subsidy	• role change from wooden boat building to a satellite maintenance and repair yard under the Harena boat yard	• gradually over 3-5 years under the supervision of the current joint venture with the Australian private company	• Ministry of Fisheries • Harena Boat Yard joint venture on Haleb Island

nsion vs sustainability	• though there's considerable room for expansion of fishing effort, current regime of quasi regulated open access not sustainable in the long run	• start the process of adopting a management regime that is based on property rights	• start a registry of fishermen, boats and gear in each fishing community • define and endorse TURF's starting with valuable fisheries like lobster and shrimp • start a process of participatory MCS	• primary and secondary operatives • research and training u (computing facility) • MCS • FAO (FIRM) • FAO (FIIT)
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47

Ex post Evaluation of ERI/92/J001(UNDP) ERI1921C01(UNCDF) and ERI/94/001(UNDP) *June 2001*

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48

Ex post Evaluation of ERU92J001(UNDP) ERI/921C01(UNCDF) and ERL1941001(UNDP) *June 2001*

49

Ex post Evaluation of ERI/921001(UNDP) ERI/92/CO1(UNCDF) and ERI/94/001(UNDP) *June 2001*

50